

Maeda Corporation



Upgrading of Ting Kok Road Pumping Station No. 5

Baseline Monitoring Report
for Landfill Gas

December 2005

Report no: 01284R0022

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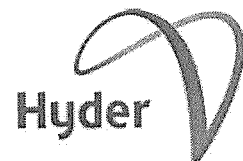
Guiyi Li

Report no: EA01284R0022

Date: December 2005

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Alexi Bhanja



Certified by Landfill Gas Team Leader
Alexi Bhanja

Consulting

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Executive Summary

Drainage Services Department awarded the contract for the upgrading of Ting Kok Road Pumping Station No. 5 to Maeda Corporation in September 2005. Maeda appointed Hyder Consulting Limited as the Contractor's Landfill Gas Team during the construction period. The construction contract commenced in September 2005 and the total construction period is approximately 28 months.

There is no EM&A Manual for this Project and there are no stated requirements for Landfill Gas baseline monitoring, in terms of methodology, monitoring parameters and equipment. As no baseline monitoring locations were specified, 2 no. existing manholes have been identified and the Contractor has also installed a new deep borehole to provide further coverage. It has been assumed that baseline monitoring should follow the requirements for impact monitoring. A Landfill Gas monitoring plan covering monitoring locations and frequencies was prepared by the Landfill Gas Team and has been agreed with the Independent Checker (Landfill Gas).

Baseline monitoring was conducted between 28 November 2005 and 1 December 2005 at three monitoring stations, designated M1, M2 and M3, for methane, carbon dioxide, oxygen and temperature, as required by the *Landfill Gas Monitoring – Field Measurement Recording Sheet*.

Methane readings were zero at all monitoring stations throughout the baseline monitoring period. Carbon dioxide readings varied from zero to 0.4% and oxygen readings varied from 18.6% to 20.5%. Gas temperature varied from 23.3°C to 28.6°C. That no methane was detected is not unexpected, given the fact that there has not been any methane detected in the perimeter monitoring locations around Shuen Wan Landfill under the ongoing landfill restoration contract. The minor variations in carbon dioxide levels and oxygen levels are within expected norms and are not of concern.

The baseline monitoring results are not used to derive the A/L Levels for LFG impact monitoring, since these have already been defined in the *Report on Landfill Gas Hazard Assessment* and will be adopted for the interpretation of impact environmental monitoring results.

1 Project Background Information

Upgrading of Ting Kok Road Pumping Station No. 5 (TKRPS) under North District and Tolo Harbour Sewerage, Sewage Treatment and Disposal – High Priority Works is implemented based on the findings of the Study *Review of North District and Tolo Harbour Sewerage Master Plan*.

The purpose of the Project is to upgrade the existing TKRPS to cope with the sewerage needs of both existing and future developments along Ting Kok Road up to Tai Mei Tuk. The design pumping capacity of TKRPS has to be increased from 2,888m³/day to 11,520m³/day in order to serve the increasing sewage flow along Ting Kok Road. The Project is of high priority and needs to commence as soon as possible because full commissioning of the upstream sewerage facilities along Ting Kok Road is dependent on the completion of this Project.

The proposed scope of works includes construction of a new pumping station, laying of about 350m long twin 450mm diameter rising mains and 250m long 600mm diameter gravity sewer, and demolition of the existing pump pit. The main pumping station, transformer room, gravity sewers, manholes and boundary wall (except the twin rising mains) will be located outside the existing passive vent trench of Shuen Wan Landfill and the three existing Landfill Gas (LFG) monitoring probes within the Project site will not be affected by the works.

There are six village houses located about 60m away from the boundary of the proposed pumping station. The proposed pumping station upgrading works therefore constitutes a Designated Project under type F.3(b)(i) in Schedule 2 of the Environmental Impact Assessment Ordinance. A Project Profile (PP) for direct application of the Environmental Permit (EP) (Application No.DIR-115/2005) was approved by the Environmental Protection Department (EPD) in March 2005 and an EP (EP-212/2005) was granted in April 2005, prior to the commencement of the upgrading works.

Drainage Services Department awarded the contract for the upgrading of TKRPS to Maeda Corporation in September 2005. Maeda appointed Hyder Consulting Limited as the Contractor's Landfill Gas Team (LGT) during the construction period. The construction contract commenced in September 2005 and the total construction period is approximately 28 months.

Close proximity of the Project to Shuen Wan Landfill (within the 250m Consultation Zone of Shuen Wan Landfill) may also suggest the possibility of landfill gas being released during excavation works for substructure of pumping station, transformer room and associated rising mains and gravity sewers. As such, a *Report on Landfill Gas Hazard Assessment* has been prepared previously (as Appendix E to the PP) in accordance with EPD's *Landfill Gas Hazard Assessment Guidance Note* and the *Practice Note for Professional Persons – Landfill Gas Hazard Assessment for Development Adjacent to Landfills*.

2 The Purpose of the Report

Baseline monitoring of LFG was undertaken in accordance with the PP prior to the commencement of any construction activities on-site.

The purpose of this report is to summarise the findings of this baseline monitoring and to confirm the Action and Limit (A/L) Levels for the subsequent environmental impact monitoring during construction stage. Other than this introductory section, the report will provide information on monitoring methodology, monitoring results, A/L Levels, and conclusions.

3 Baseline Monitoring Methodology

According to the requirements given in Section 8.9.2 of the *Report on Landfill Gas Hazard Assessment* (Appendix E to the PP), a Baseline Monitoring Report should be prepared and submitted within 10 working days of the completion of baseline monitoring. No further guidance is provided, other than requirements for report format and data format, which have been followed.

3.1 Methodology, Monitoring Parameters and Equipment

As there are no stated requirements for LFG baseline monitoring, in terms of methodology, monitoring parameters and equipment, it has been assumed that baseline monitoring should follow the requirements for impact monitoring. A LFG monitoring plan was initially prepared by the LGT and has been agreed with the Independent Checker (Landfill Gas) (IC(LG)).

The baseline monitoring was undertaken by the LGT. Baseline monitoring was conducted for methane, carbon dioxide, oxygen and temperature, as required by the *Landfill Gas Monitoring – Field Measurement Recording Sheet* (sample provided as Appendix F to the *Report on Landfill Gas Hazard Assessment*).

Table 3-1 shows the equipment list for baseline monitoring of LFG.

Equipment	Manufacturer / Serial Nos.	Qty.
Gas Analyser GA 2000	Geotechnical Instruments / GA 08277	1

Table 3-1 Equipment List for Baseline Monitoring of LFG

Monitoring was carried out at each monitoring station. For Monitoring Station M1 (see Section 3.3) The built-in gas tap was opened to the atmosphere for at least 30 seconds to allow purging. After this, the sampling point was connected to the Gas Analyser, which draws gas from the sampling point using an internal pump. For Monitoring Stations M2 and M3, the manhole cover was slightly lifted at one end to enable the plastic tube connected to the Gas Analyser to be fed into the void space below. The manhole cover was not lifted more than necessary so as to reduce ingress of fresh air, which could unduly affect the readings of gas composition within the manholes.

When stable readings were indicated by the Gas Analyser, values for each parameter were read from the display of the Gas Analyser and entered onto the *Field Measurement Recording Sheet*.

3.2 Maintenance and Calibration

Prior to the commencement of monitoring, the equipment was thoroughly checked and was verified to be in working order (see Verification Checklist in Appendix 1). The equipment was also calibrated against gas standards and the calibration was certified (see Certificate of Calibration, also in Appendix 1).

3.3 Monitoring Locations

No baseline monitoring locations were specified in the *Report on Landfill Gas Hazard Assessment*, although “utilities’ manholes and chambers” and at excavations of 1m depth or more were specified for impact monitoring.

Therefore, in order to be able to carry out baseline monitoring of LFG, 2 no. existing manholes have been identified and the Contractor has also installed a new deep borehole to provide further coverage. The agreement of the IC(LG) to these locations (as part of the LFG monitoring plan) was received prior to the commencement of baseline monitoring.

The monitoring locations are summarised in Table 3-2 and shown in Figure 3-1.

Monitoring Station ID	Description	Location (Grid Reference)	
		Easting	Northing
M1	New Deep Borehole (11m deep)	837700.970	835763.601
M2	Existing Manhole (2m deep)	837713.493	835807.318
M3	Existing Manhole (2m deep)	837729.772	835810.523

Table 3-2 Baseline Monitoring Locations for LFG

3.4 Monitoring Frequency

No baseline monitoring frequency was specified in the *Report on Landfill Gas Hazard Assessment*, and only non-specific “regular” monitoring was specified for impact monitoring.

Therefore, in order to be able to carry out baseline monitoring of LFG, it was proposed to carry out monitoring three times during the baseline period. The agreement of the IC(LG) to this frequency (as part of the LFG monitoring plan) was received prior to the commencement of baseline monitoring.

Baseline monitoring was conducted between 28 November 2005 and 1 December 2005.

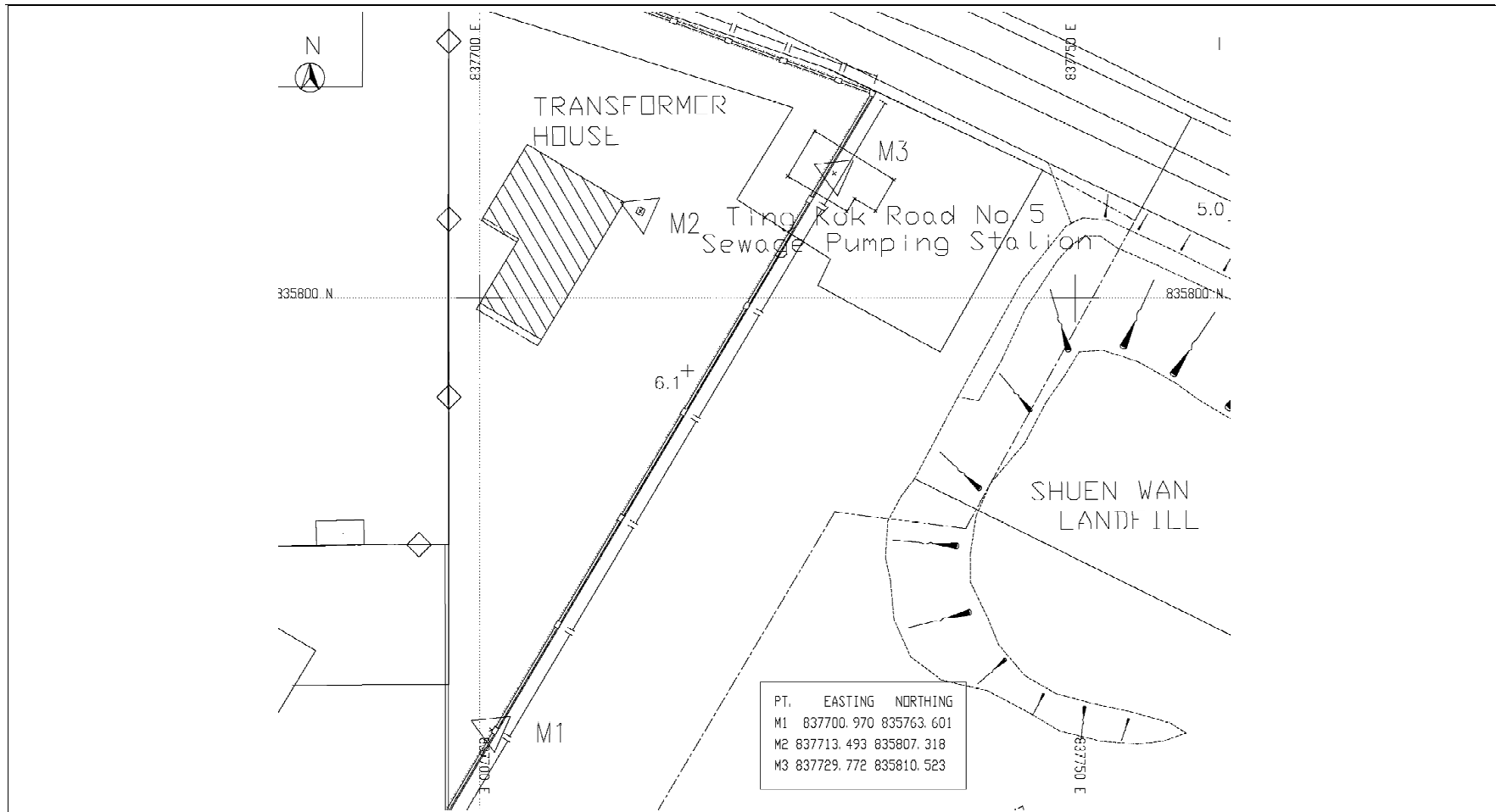


Figure 3-1 Baseline LFG Monitoring Stations

4 Baseline Monitoring Results

4.1.1 Weather Conditions and Other Factors

Baseline monitoring was conducted between 28 November 2005 and 1 December 2005. The weather was sunny, fine and dry during the baseline monitoring period.

4.1.2 Results

The baseline monitoring results for LFG are shown in Table 4-3 and the *Field Measurement Recording Sheet* is provided in Appendix 2.

Methane readings were zero at all monitoring stations throughout the baseline monitoring period. Carbon dioxide readings varied from zero to 0.4% and oxygen readings varied from 18.6% to 20.5%. Gas temperature varied from 23.3°C to 28.6°C.

Monitoring Station ID	Date	Gas Concentration (%age)			Temperature (°C)
		Methane	Carbon Dioxide	Oxygen	
M1	28/11/2005	0.0	0.0	20.4	28.6
	29/11/2005	0.0	0.0	20.4	24.4
	01/12/2005	0.0	0.0	20.5	23.3
M2	28/11/2005	0.0	0.2	19.3	27.1
	29/11/2005	0.0	0.4	18.6	25.0
	01/12/2005	0.0	0.2	19.7	24.9
M3	28/11/2005	0.0	0.1	19.9	27.4
	29/11/2005	0.0	0.0	20.5	26.4
	01/12/2005	0.0	0.1	20.3	24.2

Table 4-3 Baseline Monitoring Results for LFG

It should be noted that the oxygen reading at Monitoring Station M2 on 29 November was below the A/L Level of 19%. During the works, if such a reading was recorded in a confined space (such as a manhole or trench) in which workers were present, then the Action Plan would be followed, i.e. ventilate to restore oxygen level to >19%. However, as this occurred during baseline monitoring using a Gas Probe and workers were not present within the manhole, no precautionary measures were necessary.

5 Statistical Analysis of the Baseline Data

The LFG monitoring plan, which has been agreed by the IC(LG), noted that it would not be possible to carry out a statistical analysis of the baseline data against control

and impact stations, as “control stations” are not needed in this Project and impact monitoring has not yet commenced. As such, there are no revisions to make to the PP or the *Report on Landfill Gas Hazard Assessment* at this time.

6 Action and Limit Levels

The baseline monitoring results are not used to derive the A/L Levels for LFG impact monitoring, since these have already been defined in the *Report on Landfill Gas Hazard Assessment*. Table 5-4 shows the A/L Levels for LFG as stated in the *Report on Landfill Gas Hazard Assessment* and it is confirmed that these A/L Levels will be adopted for the interpretation of impact environmental monitoring results. If the A/L Levels are triggered, the Event and Action Plan summarised in Table 5-4 should be implemented immediately.

Parameter	A/L Level	Action Plan
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%

Table 6-4 A/L Levels and Action Plan for LFG

7 Comments, Recommendations and Conclusions

Baseline monitoring was carried out at three monitoring stations between 28 November 2005 and 1 December 2005. The set of baseline data is considered to be representative of the LFG regime below ground.

No methane was detected at any time during the baseline period. This result is not unexpected, given the fact that methane has also not been detected in the perimeter monitoring locations around Shuen Wan Landfill under the ongoing landfill restoration contract (see data in Appendix 3). The minor variations in carbon dioxide levels and oxygen levels are within expected norms and are not of concern.

Action and Limit Levels for each parameter have already been defined in the *Report on Landfill Gas Hazard Assessment* and these will be adopted for the interpretation of impact environmental monitoring results.

Appendix 1

Verification Checklist and Calibration Certificates

Verification Checklist

Product Type: Gas Analyser

GA 2000

Serial Number: GA 08277

Checks and processes to be carried out		(✓) or (n/a)	
Documents	All paperwork has been completed and signed	✓	
	Solenoid by-pass - signed as reconnected (GEM-500 only)	N/A	
Functions, options & settings	Anemometer set (refer Precal Sheet)	✓	
	H2 warning level set (compensated CO only, refer Project 1 or Precal Sheet)	N/A	
	Baud rate set to 19200+HS (2K ONLY)	✓	
	Barometer set (± 5mbar of actual)	✓	
	Internal Gas sensors fitted	Cell 1	N/A
		Cell 2	N/A
		Cell 3	N/A
		Oxy cell	✓
	Current software version correct (write current version)	✓ 2.35	
	Current time correct	✓	
	Date format correct	(UK) USA	
	Company logo correct	✓	
	Instrument type correct (refer to opening title screen)	✓	
	Lifetime guarantee	on / off	
Service due date set (current date + 6 months)	✓		
Last gas check date set (refer outward gas check)	✓		
Sample flow	Vacuum tested at inlet port	✓	
	Flow correct	✓	
	Flow fail operates correctly	✓	
Ancillary readings	Temperature probe registers correct temperature	✓	
	Analyser recognises gas pod correctly	✓	
	Analyser recognises flow pod correctly	✓	
Pressure transducer	Check 5psi relative pressure transducer set using DPI	✓	
	Check 1psi differential pressure transducer set using DPI (GEM ONLY)	N/A	
Labels	All relevant product labels are fitted correctly	✓	
	'Ex' screen printing/label is clear/correct for product	✓	
	Battery cover sealing tape fitted (Hyperbaric units only)	N/A	
Accessories	All relevant accessories included correct	✓	
Memory & battery	Update EPROM database (2K only)	✓	
	Update GA Production database	✓	
	Memory clear (unless client requests otherwise)	✓	
	New batteries fitted as standard (NMRI Hyperbaric units only)	N/A	
	Battery life tested by logging (If new 2k battery fitted only)	14 Hrs	
Comments			

Verified By: L. Gibbs (ref. FI0002) Date: 08.11.05.
Signed Printed

CERTIFICATE OF CALIBRATION

Certificate number: GA08277L0041105
 Date of Calibration: 04/11/05
 Product: GA 2000
 Serial number: GA08277

CALIBRATION CHECK RESULTS

Primary Gas Channels

Methane		Carbon Dioxide	
Certified Gas %	Reading %	Certified Gas %	Reading %
0.0	0.0	0.0	0.0
0.5	0.4	0.5	0.4
5.0	5.0	5.0	4.5
14.8	14.7	14.8	14.2
59.5	59.9	40.5	37.8
50.1	50.9	49.9	47.5
100.0	99.0	0.0	0.0

Oxygen Channel

Certified Gas	0% O ₂	4.95 % O ₂	Air (20.9% nominal)
Reading	0.0 %	4.8 %	20.9 %

Approved by:

L. Gibbs

(Name)

L. Gibbs

(Signature)

All gases are certified to traceable National Standards.

This unit must be serviced at regular 6 monthly intervals by a Geotechnical Instruments Ltd approved service facility.

Appendix 2

Baseline LFG Monitoring Results

**ANNEX A
Landfill Gas Monitoring - Field Measurement Recording Sheet (Sample)**

Name of site: Thy Kote Road

Date of measurement: 28/11/05, 29/11/05 & 1/12/05

Sampling equipment used:	Dates calibrated
Gas Analyser GA 2000	Refer to
Serial no. GA 0827	calibration certificate

Sample location	Date of measurement	Sampling time	Weather condition	Perimeter on-site and/or off-site monitoring holes					Remark
				Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M01	28/11/05	15:55	Sunny	79.6	0.0	0.0	20.4	28.6	
M02	28/11/05	16:06	"	80.5	0.0	0.2	19.3	27.1	
M03	28/11/05	16:00	"	80.0	0.0	0.1	19.9	27.4	
M01	29/11/05	11:16	"	79.6	0.0	0.0	20.4	24.4	
M02	29/11/05	11:19	"	81.0	0.0	0.4	18.6	25.0	
M03	29/11/05	11:22	"	79.5	0.0	0.0	20.5	26.4	
M01	1/12/05	10:06	"	79.5	0.0	0.0	20.5	22.3	
M02	1/12/05	10:13	"	80.1	0.0	0.2	19.7	24.9	
M03	1/12/05	10:18	"	79.6	0.0	0.1	20.3	24.2	

Field Technician: [Signature]

Checked by: [Signature]

DCZ005/01

Particular Specification

PSAPP 118-15

Appendix 3

LFG Monitoring Data from Shuen Wan Landfill Restoration Contract

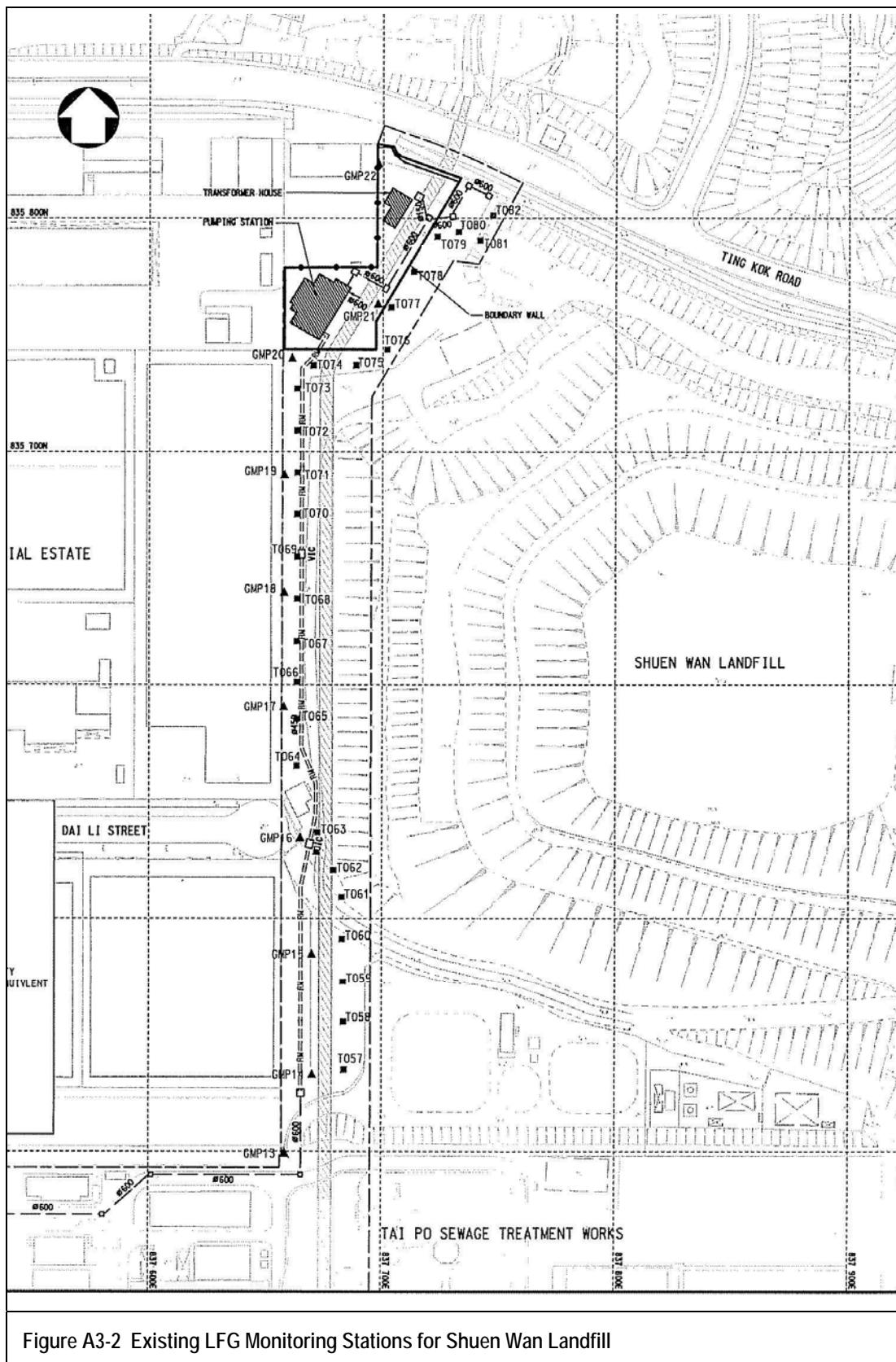


Figure A3-2 Existing LFG Monitoring Stations for Shuen Wan Landfill

Landfill Gas monitoring data

Location	Date	CH4	CO2	O2	Temp.
GMP13D	October 2004	0.0	1.5	17.7	29.0
GMP13D	November 2004	0.0	0.0	20.0	26.0
GMP13D	December 2004	0.0	0.9	18.9	23.0
GMP13D	January 2005	0.0	1.0	18.8	20.0
GMP13D	February 2005	0.0	0.0	20.2	9.9
GMP13D	March 2005	0.0	0.0	20.1	21.0
GMP13D	April 2005	0.0	0.2	19.8	20.0
GMP13D	May 2005	0.0	0.5	17.5	32.0
GMP13D	June 2005	0.0	0.0	20.1	30.0
GMP13D	July 2005	0.0	0.9	19.0	30.0
GMP13D	September 2005	0.0	0.0	19.9	31.0
GMP13M	October 2004	0.0	0.3	19.4	30.0
GMP13M	November 2004	0.0	0.0	20.1	26.0
GMP13M	December 2004	0.0	0.0	20.0	23.0
GMP13M	January 2005	0.0	0.0	20.2	20.0
GMP13M	February 2005	0.0	0.0	20.2	9.9
GMP13M	March 2005	0.0	0.2	19.9	21.0
GMP13M	April 2005	0.0	0.5	19.2	20.0
GMP13M	May 2005	0.0	0.0	19.9	32.0
GMP13M	June 2005	0.0	0.1	20.0	30.0
GMP13M	July 2005	0.0	0.0	20.3	30.0
GMP13M	September 2005	0.0	0.0	19.9	31.0
GMP13S	October 2004	0.0	0.6	19.2	30.0
GMP13S	November 2004	0.0	0.6	19.7	26.0
GMP13S	December 2004	0.0	0.6	19.5	24.0
GMP13S	January 2005	0.0	0.6	19.6	20.0
GMP13S	February 2005	0.0	0.2	20.0	9.9
GMP13S	March 2005	0.0	0.6	19.3	21.0
GMP13S	April 2005	0.0	0.5	19.3	20.0
GMP13S	May 2005	0.0	0.0	19.9	31.0
GMP13S	June 2005	0.0	0.4	19.6	30.0
GMP13S	July 2005	0.0	0.0	20.4	30.0
GMP13S	September 2005	0.0	0.6	19.0	31.0
GMP14D	October 2004	0.0	0.0	20.0	26.0
GMP14D	November 2004	0.0	0.0	20.3	24.0
GMP14D	December 2004	0.0	0.4	19.0	25.0
GMP14D	January 2005	0.0	0.2	19.2	21.0
GMP14D	February 2005	0.0	2.0	18.6	9.3
GMP14D	March 2005	0.0	0.0	20.0	21.0
GMP14D	April 2005	0.0	0.0	19.8	19.0
GMP14D	May 2005	0.0	0.0	19.9	30.0

GMP14D	June 2005	0.0	0.0	10.2	31.0
GMP14D	July 2005	0.0	0.0	20.2	30.0
GMP14D	September 2005	0.0	0.0	19.5	30.0
GMP14M	October 2004	0.0	2.6	17.4	26.0
GMP14M	November 2004	0.0	4.0	16.6	24.0
GMP14M	December 2004	0.0	1.5	17.0	25.0
GMP14M	January 2005	0.0	1.3	17.4	20.0
GMP14M	February 2005	0.0	2.9	17.9	9.2
GMP14M	March 2005	0.0	3.3	17.3	20.0
GMP14M	April 2005	0.0	2.6	17.5	19.0
GMP14M	May 2005	0.0	6.4	3.5	29.0
GMP14M	June 2005	0.0	4.1	16.1	30.0
GMP14M	July 2005	0.0	5.2	13.5	30.0
GMP14M	September 2005	0.0	1.0	16.8	30.0
GMP14S	October 2004	0.0	0.0	19.9	26.0
GMP14S	November 2004	0.0	0.0	20.4	24.0
GMP14S	December 2004	0.0	2.9	19.5	23.0
GMP14S	January 2005	0.0	3.2	17.2	21.0
GMP14S	February 2005	0.0	0.0	20.0	9.3
GMP14S	March 2005	0.0	0.0	20.0	21.0
GMP14S	April 2005	0.0	0.0	19.8	19.0
GMP14S	May 2005	0.0	0.0	19.7	29.0
GMP14S	June 2005	0.0	0.0	20.2	30.0
GMP14S	July 2005	0.0	0.0	20.2	30.0
GMP14S	September 2005	0.0	0.0	20.0	29.0
GMP15D	October 2004	0.0	0.0	20.1	27.0
GMP15D	November 2004	0.0	0.0	20.3	25.0
GMP15D	December 2004	0.0	3.8	18.5	24.0
GMP15D	January 2005	0.0	3.4	17.8	21.0
GMP15D	February 2005	0.0	0.0	20.1	9.2
GMP15D	March 2005	0.0	0.0	20.1	21.0
GMP15D	June 2005	0.0	0.0	20.3	30.0
GMP15M	October 2004	0.0	0.0	20.0	27.0
GMP15M	November 2004	0.0	0.0	20.2	25.0
GMP15M	December 2004	0.0	4.0	17.6	24.0
GMP15M	January 2005	0.0	3.2	17.6	21.0
GMP15M	February 2005	0.0	0.0	20.2	9.4
GMP15M	March 2005	0.0	0.2	20.0	21.0
GMP15M	June 2005	0.0	0.1	20.0	30.0
GMP15S	October 2004	0.0	0.0	20.1	27.0
GMP15S	November 2004	0.0	0.0	20.2	25.0
GMP15S	December 2004	0.0	4.5	16.4	24.0
GMP15S	January 2005	0.0	4.1	17.4	21.0
GMP15S	February 2005	0.0	0.0	20.2	9.2
GMP15S	March 2005	0.0	0.0	19.9	21.0

GMP15S	June 2005	0.0	0.0	20.1	30.0
GMP16M	October 2004	0.0	0.9	19.2	33.0
GMP16M	November 2004	0.0	1.0	18.9	27.0
GMP16M	December 2004	0.0	1.9	19.6	24.0
GMP16M	January 2005	0.0	1.4	18.2	20.0
GMP16M	February 2005	0.0	0.0	20.2	8.0
GMP16M	March 2005	0.0	0.0	20.0	21.0
GMP16M	June 2005	0.0	0.0	20.0	30.0
GMP16S	October 2004	0.0	0.7	19.3	32.0
GMP16S	November 2004	0.0	1.1	19.0	27.0
GMP16S	December 2004	0.0	1.2	18.5	25.0
GMP16S	January 2005	0.0	1.0	18.0	20.0
GMP16S	February 2005	0.0	0.0	20.2	9.0
GMP16S	March 2005	0.0	0.3	19.7	21.0
GMP16S	June 2005	0.0	0.4	19.0	32.0
GMP17D	October 2004	0.0	0.0	20.1	27.0
GMP17D	November 2004	0.0	0.0	20.3	24.0
GMP17D	December 2004	0.0	1.6	17.5	24.0
GMP17D	January 2005	0.0	1.2	18.4	20.0
GMP17D	February 2005	0.0	0.0	20.2	9.0
GMP17D	March 2005	0.0	0.4	19.6	21.0
GMP17D	April 2005	0.0	0.0	20.2	20.0
GMP17D	May 2005	0.0	0.0	19.7	30.0
GMP17D	June 2005	0.0	0.2	19.8	30.0
GMP17D	July 2005	0.0	0.0	20.3	29.0
GMP17D	September 2005	0.0	0.0	20.0	30.0
GMP17M	October 2004	0.0	0.0	20.0	27.0
GMP17M	November 2004	0.0	0.0	20.2	24.0
GMP17M	December 2004	0.0	0.9	18.0	23.0
GMP17M	January 2005	0.0	0.4	18.9	21.0
GMP17M	February 2005	0.0	0.0	20.2	9.0
GMP17M	March 2005	0.0	0.3	19.7	21.0
GMP17M	April 2005	0.0	0.0	20.2	20.0
GMP17M	May 2005	0.0	0.0	19.7	30.0
GMP17M	June 2005	0.0	0.3	19.7	30.0
GMP17M	July 2005	0.0	0.0	20.2	29.0
GMP17M	September 2005	0.0	0.0	20.1	30.0
GMP17S	October 2004	0.0	0.0	20.0	27.0
GMP17S	November 2004	0.0	0.0	20.2	24.0
GMP17S	December 2004	0.0	0.3	19.4	23.0
GMP17S	January 2005	0.0	0.1	19.9	21.0
GMP17S	February 2005	0.0	0.0	20.2	9.0
GMP17S	March 2005	0.0	0.0	20.0	21.0
GMP17S	April 2005	0.0	0.0	20.0	20.0
GMP17S	May 2005	0.0	0.0	19.7	30.0

GMP17S	June 2005	0.0	0.0	20.2	31.0
GMP17S	July 2005	0.0	0.0	20.2	29.0
GMP17S	September 2005	0.0	0.0	19.9	30.0
GMP18M	October 2004	0.0	0.0	20.1	27.0
GMP18M	November 2004	0.0	0.0	20.4	24.0
GMP18M	December 2004	0.0	0.2	18.5	24.0
GMP18M	January 2005	0.0	0.2	19.6	21.0
GMP18M	February 2005	0.0	0.0	20.3	9.0
GMP18M	March 2005	0.0	0.0	20.1	20.0
GMP18M	June 2005	0.0	0.0	20.1	31.0
GMP18S	October 2004	0.0	0.0	20.1	27.0
GMP18S	November 2004	0.0	0.0	20.2	24.0
GMP18S	December 2004	0.0	0.0	19.9	24.0
GMP18S	January 2005	0.0	0.0	20.1	21.0
GMP18S	February 2005	0.0	0.0	20.3	9.0
GMP18S	March 2005	0.0	0.0	19.9	20.0
GMP18S	June 2005	0.0	0.0	20.2	30.0
GMP19M	October 2004	0.0	0.0	20.1	26.0
GMP19M	November 2004	0.0	0.0	20.3	25.0
GMP19M	December 2004	0.0	0.0	20.1	23.0
GMP19M	January 2005	0.0	0.0	20.1	21.0
GMP19M	February 2005	0.0	0.0	20.3	8.0
GMP19M	March 2005	0.0	0.0	20.0	21.0
GMP19M	June 2005	0.0	0.0	21.2	29.0
GMP19S	October 2004	0.0	0.0	20.0	26.0
GMP19S	November 2004	0.0	0.0	20.3	25.0
GMP19S	December 2004	0.0	0.4	19.4	25.0
GMP19S	January 2005	0.0	0.2	19.9	21.0
GMP19S	February 2005	0.0	0.0	20.3	8.0
GMP19S	March 2005	0.0	0.0	20.1	21.0
GMP19S	June 2005	0.0	0.0	20.3	29.0
GMP20M	October 2004	0.0	0.0	20.2	25.0
GMP20M	November 2004	0.0	0.0	20.3	25.0
GMP20M	December 2004	0.0	0.7	18.6	23.0
GMP20M	January 2005	0.0	0.6	19.4	20.0
GMP20M	February 2005	0.0	1.1	19.4	9.0
GMP20M	March 2005	0.0	0.0	20.1	21.0
GMP20M	April 2005	0.0	0.0	20.0	19.0
GMP20M	May 2005	0.0	0.0	19.9	29.0
GMP20M	June 2005	0.0	0.0	20.2	31.0
GMP20M	July 2005	0.0	0.0	20.3	30.0
GMP20M	September 2005	0.0	0.0	20.2	31.0
GMP20S	October 2004	0.0	0.0	20.0	25.0
GMP20S	November 2004	0.0	0.0	20.3	25.0
GMP20S	December 2004	0.0	0.8	18.5	25.0

GMP20S	January 2005	0.0	0.4	19.6	20.0
GMP20S	February 2005	0.0	0.2	20.0	9.0
GMP20S	March 2005	0.0	0.0	20.0	21.0
GMP20S	April 2005	0.0	0.0	20.1	19.0
GMP20S	May 2005	0.0	0.0	19.9	30.0
GMP20S	June 2005	0.0	0.0	20.2	31.0
GMP20S	July 2005	0.0	0.0	20.0	30.0
GMP20S	September 2005	0.0	0.0	20.3	31.0
GMP21M	October 2004	0.0	0.8	17.8	30.0
GMP21M	November 2004	0.0	0.0	20.2	25.0
GMP21M	December 2004	0.0	0.0	19.9	23.0
GMP21M	January 2005	0.0	0.0	20.2	21.0
GMP21M	February 2005	0.0	3.5	16.9	10.0
GMP21M	March 2005	0.0	0.2	19.8	21.0
GMP21M	April 2005	0.0	0.0	20.0	20.0
GMP21M	May 2005	0.0	0.0	19.7	30.0
GMP21M	June 2005	0.0	0.1	19.9	31.0
GMP21M	July 2005	0.0	0.0	20.2	30.0
GMP21M	September 2005	0.0	0.0	20.3	31.0
GMP21S	October 2004	0.0	0.2	19.5	28.0
GMP21S	November 2004	0.0	3.6	12.7	25.0
GMP21S	December 2004	0.0	0.0	19.8	23.0
GMP21S	January 2005	0.0	0.0	20.2	21.0
GMP21S	February 2005	0.0	3.6	16.5	10.0
GMP21S	March 2005	0.0	0.0	20.1	21.0
GMP21S	April 2005	0.0	0.0	20.0	20.0
GMP21S	May 2005	0.0	0.0	19.7	30.0
GMP21S	June 2005	0.0	0.0	20.3	32.0
GMP21S	July 2005	0.0	0.0	20.2	30.0
GMP21S	September 2005	0.0	0.0	2.4	31.0
GMP22M	October 2004	0.0	0.0	20.0	27.0
GMP22M	November 2004	0.0	0.0	20.2	25.0
GMP22M	December 2004	0.0	0.0	20.0	24.0
GMP22M	January 2005	0.0	0.0	20.2	20.0
GMP22M	February 2005	0.0	0.0	20.2	9.0
GMP22M	March 2005	0.0	0.3	19.7	21.0
GMP22M	April 2005	0.0	0.0	20.0	20.0
GMP22M	May 2005	0.0	0.0	19.7	34.0
GMP22M	June 2005	0.0	0.2	19.8	31.0
GMP22M	July 2005	0.0	0.0	20.2	30.0
GMP22M	September 2005	0.0	0.0	20.4	30.0
GMP22S	October 2004	0.0	0.1	20.0	27.0
GMP22S	November 2004	0.0	0.1	20.1	25.0
GMP22S	December 2004	0.0	0.0	20.0	24.0
GMP22S	January 2005	0.0	0.0	20.3	20.0

GMP22S	February 2005	0.0	0.1	20.2	9.0
GMP22S	March 2005	0.0	0.0	20.0	21.0
GMP22S	April 2005	0.0	0.0	20.0	20.0
GMP22S	May 2005	0.0	0.0	19.7	35.0
GMP22S	June 2005	0.0	0.0	20.2	31.0
GMP22S	July 2005	0.0	0.0	20.3	30.0
GMP22S	September 2005	0.0	0.0	20.3	30.0
P45	October 2004	0.0	2.6	18.0	24.0
P45	November 2004	0.0	1.1	19.0	24.0
P45	December 2004	0.0	1.3	18.8	15.4
P45	January 2005	0.0	1.0	19.0	20.0
P45	February 2005	0.0	2.8	18.6	10.2
P45	March 2005	0.0	0.4	19.6	27.0
P45	April 2005	0.0	0.0	20.2	20.0
P45	May 2005	0.0	0.0	19.9	30.0
P45	June 2005	0.0	0.0	20.0	29.0
P45	July 2005	0.0	0.0	20.0	30.0
P45	August 2005	0.0	0.1	19.7	30.0
P45	September 2005	0.0	0.0	20.2	30.0
T057	November 2004	0.0	0.0	20.3	24.2
T057	February 2005	0.0	0.5	19.4	24.6
T057	May 2005	0.0	0.0	20.3	30.8
T057	August 2005	0.0	0.1	19.9	31.6
T058	December 2004	0.0	0.0	20.3	18.7
T058	March 2005	0.0	0.0	20.3	22.6
T058	June 2005	0.0	0.0	20.0	29.0
T058	September 2005	0.0	0.0	19.9	30.0
T059	October 2004	0.0	0.0	20.3	28.0
T059	January 2005	0.0	0.0	20.4	18.3
T059	April 2005	0.0	0.1	20.0	23.4
T059	July 2005	0.0	0.0	20.1	31.6
T060	November 2004	0.0	0.0	20.4	24.6
T060	February 2005	0.0	0.0	20.2	24.8
T060	May 2005	0.0	0.0	20.3	30.2
T060	August 2005	0.0	0.0	20.2	31.8
T061	December 2004	0.0	0.0	20.3	18.6
T061	March 2005	0.0	0.0	20.1	22.2
T061	June 2005	0.0	0.0	20.0	29.3
T061	September 2005	0.0	0.0	20.0	30.3
T062	October 2004	0.0	0.0	20.0	28.3
T062	January 2005	0.0	0.0	20.4	18.4
T062	April 2005	0.0	0.0	20.4	22.3
T062	July 2005	0.0	0.6	19.2	31.2
T063	November 2004	0.0	0.0	20.4	24.3
T063	February 2005	0.0	0.0	20.3	24.2

T063	May 2005	0.0	0.0	20.4	30.2
T063	August 2005	0.0	0.0	20.0	31.3
T064	December 2004	0.0	0.0	20.2	18.6
T064	March 2005	0.0	0.0	20.0	22.3
T064	June 2005	0.0	0.0	20.2	29.3
T064	September 2005	0.0	0.0	20.1	30.2
T065	October 2004	0.0	0.0	20.3	28.0
T065	January 2005	0.0	0.0	20.4	18.1
T065	April 2005	0.0	0.0	20.3	23.2
T065	July 2005	0.0	0.0	20.2	31.0
T066	November 2004	0.0	0.0	20.3	24.5
T066	February 2005	0.0	0.0	20.3	24.5
T066	May 2005	0.0	0.0	20.2	30.3
T066	August 2005	0.0	0.0	20.1	31.4
T067	December 2004	0.0	0.1	19.9	18.6
T067	March 2005	0.0	0.0	20.2	22.4
T067	June 2005	0.0	0.0	20.1	28.6
T067	September 2005	0.0	0.0	20.2	30.1
T068	October 2004	0.0	0.0	20.0	28.2
T068	January 2005	0.0	0.1	20.2	18.5
T068	April 2005	0.0	0.0	20.2	23.2
T068	July 2005	0.0	0.0	20.2	31.0
T069	November 2004	0.0	0.0	20.1	24.3
T069	February 2005	0.0	0.0	20.4	24.1
T069	May 2005	0.0	0.0	20.4	30.6
T069	August 2005	0.0	0.0	20.0	31.6
T070	December 2004	0.0	0.0	20.3	18.4
T070	March 2005	0.0	0.0	20.3	22.5
T070	June 2005	0.0	0.0	20.0	28.4
T070	September 2005	0.0	0.2	19.8	30.6
T071	October 2004	0.0	0.0	20.2	28.4
T071	January 2005	0.0	0.0	20.4	18.8
T071	April 2005	0.0	0.0	20.2	23.1
T071	July 2005	0.0	0.0	20.4	31.4
T072	November 2004	0.0	0.0	20.0	24.4
T072	February 2005	0.0	0.2	20.0	24.2
T072	May 2005	0.0	0.0	20.3	30.2
T072	August 2005	0.0	0.0	20.3	31.7
T073	December 2004	0.0	0.0	20.4	18.3
T073	March 2005	0.0	0.0	20.3	22.4
T073	June 2005	0.0	0.0	20.4	28.0
T073	September 2005	0.0	0.0	20.0	30.2
T074	October 2004	0.0	0.0	20.0	28.3
T074	January 2005	0.0	0.0	20.3	18.6
T074	April 2005	0.0	0.0	20.1	23.4

T074	July 2005	0.0	0.0	20.0	31.2
T075	November 2004	0.0	0.0	19.6	24.4
T075	February 2005	0.0	0.0	20.2	24.3
T075	May 2005	0.0	0.0	20.4	30.1
T075	August 2005	0.0	0.0	20.0	32.0
T076	December 2004	0.0	0.3	19.6	18.2
T076	March 2005	0.0	0.0	20.2	22.6
T076	June 2005	0.0	0.0	20.1	28.5
T076	September 2005	0.0	0.2	19.8	30.0
T077	October 2004	0.0	0.0	20.1	28.2
T077	January 2005	0.0	0.2	20.1	18.4
T077	April 2005	0.0	0.0	20.2	23.1
T077	July 2005	0.0	0.2	19.8	31.5
T078	November 2004	0.0	0.0	20.2	24.5
T078	February 2005	0.0	0.1	20.0	24.3
T078	May 2005	0.0	0.1	19.9	30.4
T078	August 2005	0.0	0.4	19.8	32.0
T079	December 2004	0.0	0.0	20.2	18.4
T079	March 2005	0.0	0.0	20.2	22.4
T079	June 2005	0.0	0.3	19.8	28.4
T079	September 2005	0.0	0.0	20.0	30.3
T080	October 2004	0.0	0.0	20.1	28.3
T080	January 2005	0.0	0.0	20.2	18.5
T080	April 2005	0.0	0.2	19.8	23.2
T080	July 2005	0.0	0.0	20.2	31.0
T081	November 2004	0.0	0.0	19.8	24.2
T081	February 2005	0.0	0.0	20.3	24.0
T081	May 2005	0.0	0.0	20.2	30.2
T081	August 2005	0.0	0.0	20.1	31.5
T082	December 2004	0.0	0.2	19.8	18.5
T082	March 2005	0.0	0.0	20.3	22.3
T082	June 2005	0.0	0.0	20.2	28.3
T082	September 2005	0.0	0.0	20.2	30.2

T063	May 2005	0.0	0.0	20.4	30.2
T063	August 2005	0.0	0.0	20.0	31.3
T064	December 2004	0.0	0.0	20.2	18.6
T064	March 2005	0.0	0.0	20.0	22.3
T064	June 2005	0.0	0.0	20.2	29.3
T064	September 2005	0.0	0.0	20.1	30.2
T065	October 2004	0.0	0.0	20.3	28.0
T065	January 2005	0.0	0.0	20.4	18.1
T065	April 2005	0.0	0.0	20.3	23.2
T065	July 2005	0.0	0.0	20.2	31.0
T066	November 2004	0.0	0.0	20.3	24.5
T066	February 2005	0.0	0.0	20.3	24.5
T066	May 2005	0.0	0.0	20.2	30.3
T066	August 2005	0.0	0.0	20.1	31.4
T067	December 2004	0.0	0.1	19.9	18.6
T067	March 2005	0.0	0.0	20.2	22.4
T067	June 2005	0.0	0.0	20.1	28.6
T067	September 2005	0.0	0.0	20.2	30.1
T068	October 2004	0.0	0.0	20.0	28.2
T068	January 2005	0.0	0.1	20.2	18.5
T068	April 2005	0.0	0.0	20.2	23.2
T068	July 2005	0.0	0.0	20.2	31.0
T069	November 2004	0.0	0.0	20.1	24.3
T069	February 2005	0.0	0.0	20.4	24.1
T069	May 2005	0.0	0.0	20.4	30.6
T069	August 2005	0.0	0.0	20.0	31.6
T070	December 2004	0.0	0.0	20.3	18.4
T070	March 2005	0.0	0.0	20.3	22.5
T070	June 2005	0.0	0.0	20.0	28.4
T070	September 2005	0.0	0.2	19.8	30.6
T071	October 2004	0.0	0.0	20.2	28.4
T071	January 2005	0.0	0.0	20.4	18.8
T071	April 2005	0.0	0.0	20.2	23.1
T071	July 2005	0.0	0.0	20.4	31.4
T072	November 2004	0.0	0.0	20.0	24.4
T072	February 2005	0.0	0.2	20.0	24.2
T072	May 2005	0.0	0.0	20.3	30.2
T072	August 2005	0.0	0.0	20.3	31.7
T073	December 2004	0.0	0.0	20.4	18.3
T073	March 2005	0.0	0.0	20.3	22.4
T073	June 2005	0.0	0.0	20.4	28.0
T073	September 2005	0.0	0.0	20.0	30.2
T074	October 2004	0.0	0.0	20.0	28.3
T074	January 2005	0.0	0.0	20.3	18.6
T074	April 2005	0.0	0.0	20.1	23.4