03 February 2014

Paul Kristensen
Technical Manager
Transpacific Waste Management
100 Chum Street
New Chum QLD 4303

Our ref: 41/24820/7004
Your ref: REV 1

Dear Paul

New Chum Waste Disposal Facility Environmental Monitoring Annual Reporting Summary for January to December 2013

1 Introduction

GHD Pty Ltd (GHD) was commissioned by Transpacific Waste Management Pty Ltd (TPWM) to conduct groundwater, surface water, leachate and gas monitoring and reporting for the January to December 2013 reporting period at the licensed waste disposal facility (WDF) at 100 Chum Street, New Chum (Lots 268 and 227 on SP 103913). A site plan identifying the monitoring locations included in this monitoring program is attached as Figure 1, Appendix A.

The monitoring program has been established to assess compliance with the relevant conditions (Schedules) of the Environmental Authority (licence) EPPR00445713 (replacing ENRE00102604). This licence was issued by the Department of Environment and Heritage Protection (EHP) on 5 June 2013, under the provisions of the *Environmental Protection Act 1994*.

This report summarises the environmental monitoring conducted by GHD and provides a list of licence criteria exceedances measured at the New Chum WDF during the January to June 2013 reporting period. It is noted that a discussion of the field and analytical results for this reporting period is outside of the scope of this report. However a discussion of the monitoring results associated with the respective monitoring events can be found in the relevant quarterly reports shown in the report register Table 2 and included in Appendix B on the enclosed CD.

2 Regulatory compliance

This annual reporting summary is in compliance with the requirements outlined in Schedule H17 of the licence dated 5 June 2013 as outlined below:

- *Any monitoring data compiled, collected or recorded as required by conditions of this environmental authority must be evaluated, summarised and reported to the administering authority on an annual basis with the annual return. Each annual monitoring report must be given to the administering authority with the annual report in a clear summarised format.*

3 Environmental monitoring events

The environmental monitoring conducted at the New Chum WDF during the January to December 2013 reporting period is highlighted in Table 1. In addition to the scheduled monitoring events, event based air monitoring was conducted on two occasions on 13 and 15 November 2013 during a fire at the lined landfill cell, Cell 2.

Table 1 Summary of monitoring events

Monitoring Date	Groundwater	Surface Water	Leachate	Landfill Gas	Event Monitoring [#]
14 & 15 March 2013	✓	✓	✓	✓	
13 August 2013	✓	✓			
23 October 2013	✓	✓			
4 December 2013	✓	✓			
13 & 15 November 2013					✓

Notes:

Event based air monitoring in response to the fire at the lined landfill Cell 2.

4 Reporting

A summary of the reports generated by GHD during the January to December 2013 reporting period are provided in Table 2 below and copies of these reports are included as Appendix B on the enclosed CD.

Table 2 Report register

Monitoring Event	Report Title	Document Reference
14 March 2013	TPWM New Chum Environmental Monitoring March 2013 Event	41/24820/6734 Rev 1
15 March 2013	New Chum WDF – Landfill Gas Monitoring Gas Monitoring Report – March 2013	41/24820/6739 Rev 1
14 & 15 March 2013	Exception Reporting Form	2013 03 Exception Report – New Chum
13 August 2013	TPWM New Chum WDF Environmental Monitoring August 2013 Event	41/24820/6903 Rev 1
13 August 2013	Exception Reporting Form	2013 08 Exception Report – New Chum
23 October 2013	TPWM New Chum WDF Environmental	41/24820/6951 Rev 1

Monitoring Event	Report Title	Document Reference
	Monitoring October 2013 Event	
22 November 2013	New Chum Landfill Event Based Air Monitoring	41/24820/6957 Rev 1
4 December 2013	TPWM New Chum WDF Environmental Monitoring December 2013 Event	41/24820/6984 Rev 1
4 December 2013	Exception Reporting Form	2013 12 Exception Report – New Chum

5 Environmental monitoring summary

The field and analytical parameters measured for groundwater, surface water and landfill gas during the January to December 2013 reporting period were generally consistent with the respective datasets and as such typically complied with the licence criteria. Exceptions to these consistent results and a brief description of the respective monitoring events are outlined in the relevant sections below:

5.1 Groundwater

The field and analytical results measured at the groundwater monitoring wells were generally consistent with the respective data sets for individual monitoring locations with the exception of those parameters and locations outlined below.

A statistical analysis of the quarterly groundwater monitoring results measured during the January to December 2013 reporting period indicates that observation greater than the Site Criteria (i.e. a statistically significant increase over historical concentrations) were measured for the locations and analytes detailed in Table 3.

Table 3 Statistically significant groundwater results

Monitoring Event	Monitoring Location	Parameter	Concentration (mg/L)	Exceedance
14 March 2013	BH02	Ammonia as N	1.01	Site Criteria 3
	BH03	Ammonia as N	0.75	Site Criteria 3
	BH05	Ammonia as N	1.14	Site Criteria 3
	BH07	Zinc	0.5	Site Criteria 3
13 August 2013	BH03	Ammonia as N	0.66	Site Criteria 2 & 3
	BH05	Zinc	3.85	Site Criteria 3
	BH08	Zinc	0.194	Site Criteria 3
23 October 2013	BH08	Zinc	0.226	Site Criteria 2 & 3
4 December 2013	BH05	Zinc	3.58	Site Criteria 3

Monitoring Event	Monitoring Location	Parameter	Concentration (mg/L)	Exceedance
	BH07	TOC	33	Site Criteria 3

A review of the Site Criteria exceedances during the 2013 reporting period indicates that these measurements represent a continuation of the fluctuating range of results historically recorded.

The assumption is made in the context that the exceedances recorded did not occur consistently for parameters and monitoring locations over the course of consecutive monitoring events. However this assumption will continue to be reassessed as part of the quarterly monitoring events in the 2014 reporting period.

A discussion of the statistically significant groundwater monitoring results measured during the respective quarterly groundwater monitoring events are included in the relevant report included in the report register in Table 2 and Appendix B (on the enclosed CD).

On the basis of the limits of the current monitoring program, there does not appear to be any previously unidentified deterioration in groundwater quality or increasing trends in contaminant concentrations that require further investigation or management action at this point in time. Furthermore, a review of the local hydrogeology will be undertaken in the 2014 reporting period. A key objective of this review will be an assessment of the adequacy of the groundwater monitoring network, bearing in mind the likelihood that the monitoring wells in the current program are all upgradient of or hydraulically separated from the waste mass.

5.2 Surface water

Pumped discharges from the onsite sediment pond (NWH) occurred during the March, August and December 2013 events to reinstate the stormwater holding capacity at the site. As such, the field and analytical results measured at the discharge point (DIS) during these monitoring events were assessed against the licence criteria outlined in Schedules D22 to D25. The licence criteria exceedances measured during these pumped discharge events are outlined in Table 4.

Table 4 Surface water licence criteria exceedances

Monitoring Event	Monitoring Location	Parameter	Concentration	Exceedance
14 March 2013	DIS	Dissolved oxygen	5.43 mg/L	<6 mg/L [1]
	DIS	Specific conductance	2050 µS/cm	10 % [2]
13 August 2013	DIS	Specific conductance	2970 µS/cm	10 % [2]
4 December 2013	DIS	Dissolved oxygen	5.6 mg/L	<6 mg/L [1]

Monitoring Event	Monitoring Location	Parameter	Concentration	Exceedance
	DIS	Specific conductance	2270 µS/cm	10 % [2]

Notes:

1 Lower licence criteria limit of <6 mg/L

2 Upper licence criteria limit at the discharge point (DIS) of 10 % greater than the result measured at the upstream location in Six Mile Creek (SMC)

The available data at the discharge point (DIS) indicates that licence criteria exceedances are typically recorded for dissolved oxygen and specific conductance during the pumped discharge events. It is noted that the dissolved oxygen concentrations measured at the onsite sediment pond (NWH) and the discharge point (DIS) have typically fluctuated at levels greater than those measured at the upstream location in Six Mile Creek (SMC) over the respective datasets, including the current quarterly monitoring events. Additionally the specific conductance measurements at the DIS location have typically continued at levels 10 % greater than those measured at the SMC location over this reporting period. This is likely to be indicative of the notable differences in the catchments associated with these monitoring locations. A discussion of the surface water licence criteria exceedances measured at the discharge point (DIS) during the respective pumped discharge events is included in the relevant reports included in the report register in Table 2 and Appendix B (on the enclosed CD).

5.3 Landfill Gas

Annual landfill gas monitoring was conducted at the New Chum WDF on 15 March 2013 which included monitoring at the following locations:

- Ambient gas monitoring around, underneath (portable structures), and within any service pits associated with the site structures.
- Ambient surface monitoring conducted on a maximum grid spacing of 30 m across the surface of operational landfill Cell 5 and closed green waste cell (Cell 1).
- Ambient gas monitoring at nominated locations evenly spaced around the site boundary.

No exceedances of the licence criteria outlined in Schedule B9 of the licence were measured during the March 2013 annual landfill gas monitoring event.

It is noted however that concentrations greater than the adopted guideline value of 500 ppm were measured at two locations along the southern batter of the closed green waste cell (Cell 1) in the vicinity of the landfill gas vent. It is noted that limited installation or construction details pertaining to the Cell 1 landfill gas vent are available at this time. The adopted guideline value is outlined in the Queensland Department of Environment and Heritage Protection, (EHP) *Guideline, ERA 60 - Waste Disposal, Landfill siting, design, operation and rehabilitation* (EHP, 2012).

TPWM have engaged Run Energy to install a landfill gas extraction system and associated gas flare to manage the landfill gas generated at the operational cell Cell 5 and the closed green waste cell (Cell 1). However the gas extraction system was still in the construction phase at the time of writing this report. A

discussion of these guideline criteria exceedances are included in the Gas Monitoring Report shown in Table 2 and included in Appendix B.

5.4 Event based air monitoring

GHD was engaged by TPWM to conduct urgent event-based air monitoring at the New Chum WDF on 13 and 15 November 2013 during a fire at their lined landfill cell, Cell 2. The two air monitoring events were conducted to measure the concentration of a range of gasses at specific monitoring locations adjacent to Cell 2, at the WDF boundary and at the closest residential properties to the site within the Collingwood Park estate.

A summary of the monitoring results measured at levels greater than the detection limits of the gas detectors during the respective monitoring events are outlined below:

- A single concentration greater than the detection limit of the PID gas detector was measured adjacent to Cell 2 during the initial event on 13 November 2013. The concentrations for the remaining compounds were all less than the detection limit of the multi gas detector.
- Two concentrations greater than the detection limit of the PID gas detector was measured adjacent to Cell 2 during the second event on 15 November 2013. Additionally, concentrations greater than the detection limit of the multi gas detector were measured for H_2S at three locations and CO at two locations adjacent to Cell 2.

It is noted that the gas concentrations measured at the boundary and offsite monitoring locations were all less than the detection limits of both the PID and Multi gas detectors during both events.

Based on these results, no gas concentrations greater than the detection limit of the gas meters were measured at any of the boundary or off-site locations during both air monitoring events (13 and 15 November 2013). These results indicate that the gas concentrations measured adjacent to Cell 2 were not evident at the specific boundary or off-site monitoring locations. As such the offsite impacts at the specific boundary and off-site monitoring locations, at the time of sampling appeared to be limited which needs to be interpreted in the context of the prevailing weather conditions and in conjunction with the limitations outlined in Section 5 of the New Chum Landfill, Event Based Air Monitoring report referenced in Table 2 and attached in Appendix B of the enclosed CD.

6 Conclusion

The frequency of the environmental monitoring conducted at the New Chum WDF during the January to December 2013 reporting period was in accordance with the relevant Schedules of the Environmental Authority. This included quarterly groundwater and surface water monitoring and annual leachate and landfill gas monitoring. Additionally, event based air monitoring was conducted on two occasions on 13 and 15 November 2013 during a fire at the lined landfill cell, Cell 2.

The field and analytical results measured during these environmental monitoring events were generally consistent with the respective datasets at individual monitoring locations and therefore typically complied with the licence criteria.

Exceptions to the consistent results were the statistically significant groundwater results and the exceedances of the licence criteria at the discharge point (DIS) during pumped discharge events highlighted in and . The available data tends to indicate that the groundwater Site Criteria exceendances appear to be a continuation of the fluctuating range of results measured at the respective wells included in the current monitoring program. The assumption is made in the context that the exceedances recorded did not occur consistently for any parameters and monitoring locations over several monitoring events.

The licence criteria exceedances measured in surface water for dissolved oxygen and specific conductance at the discharge point (DIS) during the pumped discharge events were also consistent with historical results. The available data indicates that the dissolved oxygen concentrations measured at the onsite sediment pond (NWH) and the discharge point (DIS) have typically fluctuated at levels greater than those measured at the upstream location in Six Mile Creek (SMC) over the respective datasets. Additionally the specific conductance measurements at the DIS location have typically continued at levels 10 % greater than those measured at the SMC location over the respective datasets. This is likely to be indicative of the notable differences of the various catchments associated with these monitoring locations.

Although the annual landfill gas measurements complied with the licence criteria, two measurements greater than the adopted guideline criteria were measured along the southern batter of the closed green waste cell (Cell) in the vicinity of a landfill gas event. TPWM have subsequently engaged Run Energy to install a landfill gas extraction system and associated gas flare to manage the landfill gas generated at the operational cell Cell 5 and the closed green waste cell (Cell 1). However the gas extraction system was still in the construction phase at the time of writing this report.

On the basis of the nature, extent and frequency of the current monitoring program, there does not appear to be any previously unidentified deterioration in groundwater or surface water quality or increasing trends in contaminant or landfill gas concentrations that require further investigation or management action at this point in time.

Sincerely
GHD Pty Ltd

Wade Button
Environmental Scientist
61 7 5557 1053

Alison Colella
Principal Environmental Engineer
61 7 5557 1010

Appendix A

Site Plan

1:10,000 (at A4)

0 100 200 300 400

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

GHD CLIENTS|PEOPLE|PERFORMANCE

TRANSPACIFIC Recover Recycle Reuse

Transpacific Waste Management Pty Ltd,
Lot 268 & 227 on SP103913,
100 Chum Street, New Chum, 4303.

Job Number 41-23855
Revision 0
Date 05 Feb 2013

Monitoring Locations

Figure 1

N:\AU\Brisbane\Projects\41\23855\GIS\Maps\PDFs_MXDs\41-23855-04_TPI_newchum_samp_revA.mxd

Level 4, 201 Charlotte St Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: DERM - Cadastre (2010), Google Earth Pro - Imagery (Date extracted 01/06/2010), GHD - Ground Water Monitoring and Surface Water Sampling Locations (2013). Created: JVC

Appendix B

Reports (Included on the enclosed CD)