

Our Ref: 213337_REP_018.docx

8 June 2017

The General Manager
Oberon Council
PO Box 84
OBERON NSW 2787

Attention: Mr Gary Wallace

**ENVIRONMENTAL MONITORING – MAY 2017
OBERON WASTE FACILITY (OWF) EPL 20289**

This letter summarises the results of groundwater monitoring conducted on 17 May 2017, as well as routine surface water and accumulated gas monitoring conducted during monthly in the quarterly period from March to May 2017.

Surface Water

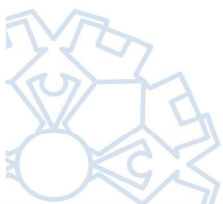
No surface water discharge events were recorded for March, April or May 2017.

Groundwater Levels

Groundwater levels were recorded at monitoring stations BH1S, BH3S, BH4S, BH5 and BH6S. Monitoring station BH2 was recorded to be dry when gauging. The locations of groundwater monitoring stations are shown on attachment Drawing 05C_EVO2. The groundwater level measurements are also provided as an attachment in **Table 1** and are illustrated below in **Chart 1**.

Groundwater monitoring locations BH1D, BH3D, BH4D and BH6D, were not scheduled to be monitored during this bi-annual monitoring event.

Of the groundwater monitoring points which were the subject of this monitoring event, eastern monitoring point BH6S has historically recorded the most elevated groundwater level, and the western monitoring points BH3S, BH4S and BH5 have recorded the lowest groundwater levels. Standing water levels were observed to have decreased at all piezometers compared to the previous monitoring round in November 2015. The average change in groundwater level was a decrease of 3.3 m.



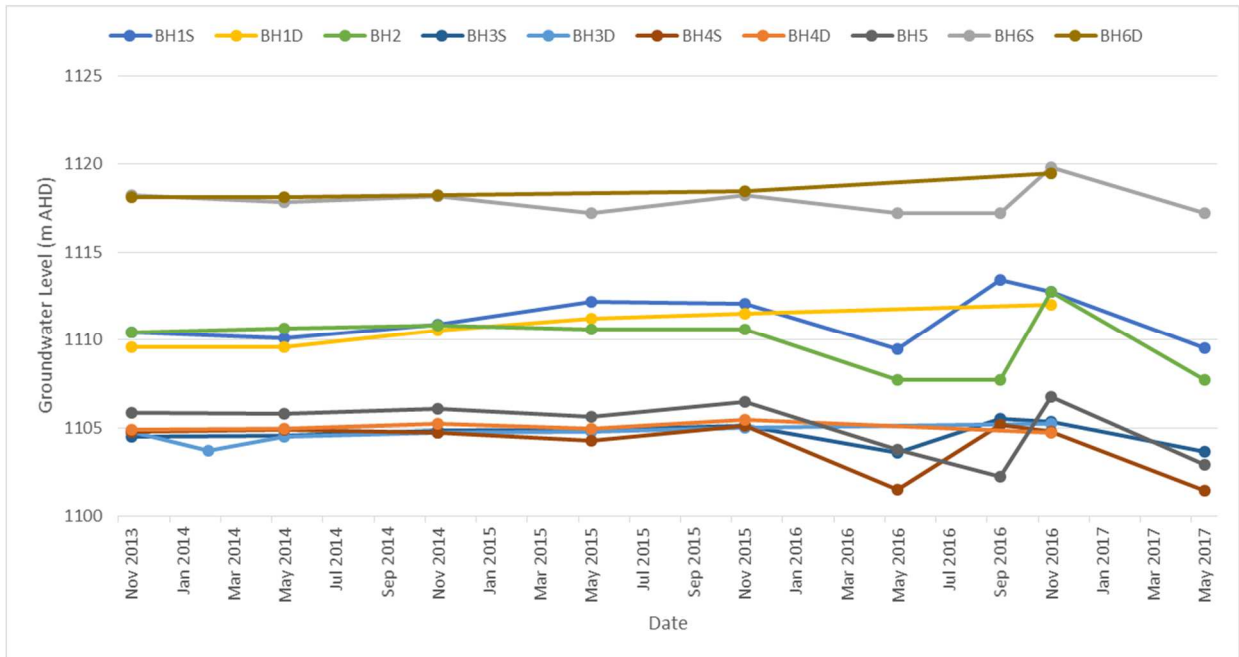


Chart 1: Groundwater Levels, November 2013 to May 2017

Groundwater Quality

The five (5) piezometers that recorded a standing water level were purged for sampling, however no piezometer recorded sufficient recharge of groundwater and samples for water quality analysis were unable to be collected.

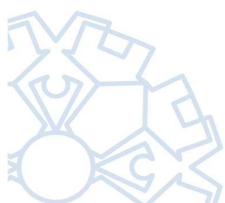
Landfill Gas

No accumulated gas was detected during routine monitoring rounds conducted in March, April or May 2017.

Conclusions

Groundwater monitoring indicated that standing levels considerably fell since the previous groundwater monitoring conducted in November 2016. No water quality samples were able to be collected.

No discharges of surface water were recorded, and no accumulated landfill gas was detected.



The next round of routine monitoring is scheduled for November 2017. Please do not hesitate to contact us with any questions or comments you may have regarding this report.

Yours faithfully
Geolyse Pty Ltd



BRENDAN STUART
Environmental Scientist

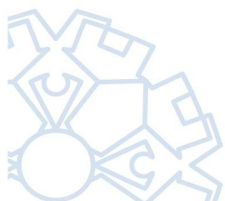
No. of Attachments – 2: Monitoring Locations
OWF – Groundwater Gauging Results

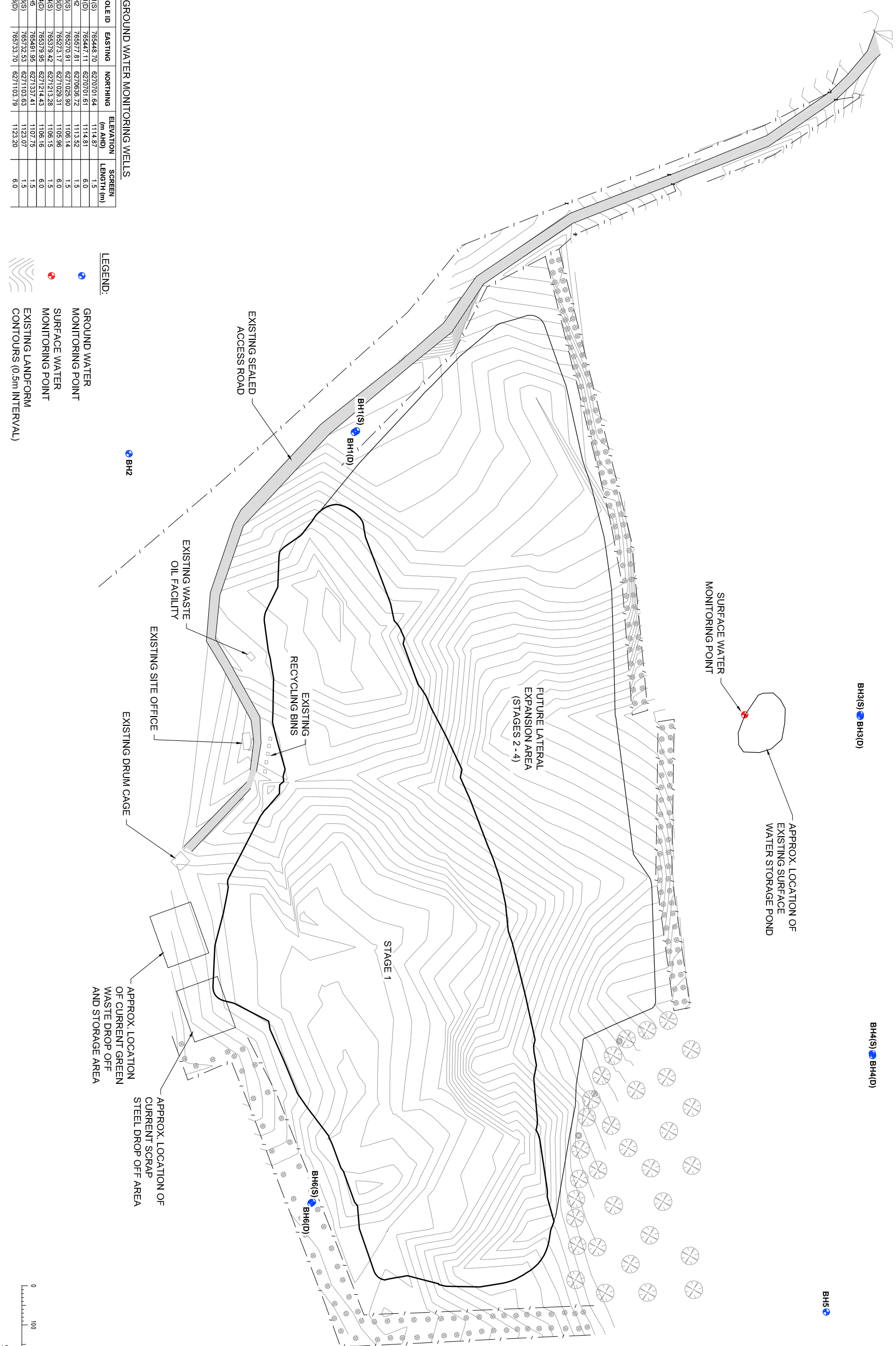
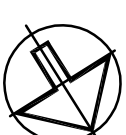
References:

Australian and New Zealand Environment and Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ), 2000, 'Australian and New Zealand Guidelines for Fresh and Marine Water Quality'.

Markwick, G 2007, 'Water requirements for sheep and cattle', Primefact 326, New South Wales Department of Primary Industries, Australia.

National Health and Medical Research Council and the Natural Resource Management Ministerial Council (NHMRC & NRMMC), 2011, 'National Water Quality Management Strategy: Australian Drinking Water Guidelines', Australia. (updated 2015)

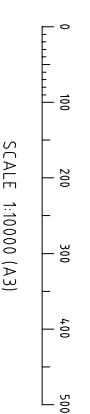




GROUND WATER MONITORING WELLS

BOREHOLE ID	EASTING	NORTHING	ELEVATION (m AHD)	SCREEN LENGTH (m)
BH1(S)	705448.70	6270701.84	1114.87	1.5
BH1(D)	705447.11	6270701.81	1114.81	6.0
BH2	705577.81	6270636.72	1113.52	1.5
BH3(S)	705270.91	6271023.90	1106.14	1.5
BH3(D)	705273.17	6271023.31	1105.96	6.0
BH4(S)	705379.42	6271213.28	1106.15	1.5
BH4(D)	705379.95	6271214.43	1106.16	6.0
BH5	705491.95	6271337.41	1107.75	1.5
BH5(S)	705732.53	6271103.83	1123.07	1.5
BH5(D)	705733.70	6271103.79	1123.20	6.0

- LEGEND:**
- + GROUND WATER MONITORING POINT
 - + SURFACE WATER MONITORING POINT
 - EXISTING LANDFORM CONTOURS (0.5m INTERVAL)



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No	DATE	DRAWING CHECK	APPROVED BY	DETAILS
A	02/05/13	LP	KH	DRAFT
B	16/05/13	LP	KH	ISSUED
C	01/10/14	MY	MH	UPDATE PIEZO BH3(D) DATA

PROJECT

**OBERON LANDFILL EXTENSION
 LANDFILL ENVIRONMENTAL MANAGEMENT PLAN**

FILE REFERENCE: 211129_A03_ENV01-REV01.dwg

APPROVAL AUTHORITY

**OBERON COUNCIL
 ENVIRONMENT
 PROTECTION AUTHORITY**

CLIENT

OBERON COUNCIL

DRAWING

**EXPANSION STAGES AND
 MONITORING POINTS**

PROJECT NUMBER: 211129
 DRAWING NUMBER: 05C_EV02
 SOURCE: INTERNAL
 REV: C

TABLE 1 - EPL 20289 OBERON WASTE FACILITY- GROUNDWATER GAUGING RESULTS

Ground Water Levels: 17-May-17

Piezometer Details:

	Ground Elev (mAHD)	Stickup (m)	Elevation Top PVC (mAHD)	Date	Measured (m)	GWL (mAHD)	Well Depth (m)	Well Base (mAHD)	Water Column (m)
BH1S	-	-	1114.87	17/05/2017	5.37	1109.50	5.50	1109.37	0.13
BH1D	-	-	1114.81	17/05/2017	WLNLM	-	26.50	1088.31	N/A
BH2	-	-	1113.52	17/05/2017	5.80	1107.72	5.80	1107.72	0.00
BH3S	-	-	1106.14	17/05/2017	2.51	1103.63	5.00	1101.14	2.49
BH3D	-	-	1105.96	17/05/2017	WLNLM	-	26.60	1079.36	N/A
BH4S	-	-	1106.15	17/05/2017	4.73	1101.42	4.80	1101.35	0.07
BH4D	-	-	1106.16	17/05/2017	WLNLM	-	50.50	1055.66	N/A
BH5	-	-	1107.75	17/05/2017	4.87	1102.88	5.50	1102.25	0.63
BH6S	-	-	1123.07	17/05/2017	5.87	1117.20	5.87	1117.20	0.00
BH6D	-	-	1123.20	17/05/2017	WLNLM	-	27.00	1096.20	N/A

Definitions:

- Stickup: Height of piezometer pipe above ground surface.
- Ground Elev: Actual elevation of ground at the piezometer relative to an arbitrary datum. All ground elevations are measured to the same datum, hence Piezo GWLs are relative to each other.
- GWL: Actual elevation of groundwater at the piezometer relative to an arbitrary datum.
- Measured: Depth of groundwater measured from the top of the piezometer pipe.
- WLNLM: *Water Level Not Measured*

Date	BH1S		BH1D		BH2		BH3S		BH3D		BH4S		BH4D		BH5		BH6S		BH6D	
	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)
19-Nov-13	4.41	1110.46	5.20	1109.61	3.06	1110.46	1.63	1104.51	1.18	1104.78	1.40	1104.75	1.27	1104.89	1.89	1105.86	4.83	1118.24	5.06	1118.14
25-Feb-14	-	-	-	-	-	-	-	-	2.28	1103.68	-	-	-	-	-	-	-	-	-	-
12-May-14	4.80	1110.07	5.20	1109.61	2.85	1110.67	1.58	1104.56	1.48	1104.48	1.26	1104.89	1.23	1104.93	1.97	1105.78	5.20	1117.87	5.07	1118.13
5-Nov-14	3.99	1110.88	4.28	1110.53	2.72	1110.80	1.31	1104.83	1.24	1104.72	1.43	1104.72	0.92	1105.24	1.66	1106.09	4.90	1118.17	4.94	1118.26
6-May-15	2.67	1112.20	3.58	1111.23	2.90	1110.62	1.27	1104.87	1.18	1104.78	1.91	1104.24	1.21	1104.95	2.11	1105.64	5.87	1117.20	WLNLM	WLNLM
23-Nov-15	2.82	1112.05	3.33	1111.48	2.90	1110.62	1.04	1105.10	0.94	1105.02	1.05	1105.10	0.70	1105.46	1.30	1106.45	4.83	1118.24	4.73	1118.47
19-May-16	5.42	1109.45	WLNLM		5.80	1107.72	2.55	1103.59	WLNLM		4.65	1101.50	WLNLM		3.97	1103.78	5.87	1117.20	WLNLM	WLNLM
5-Sep-16	1.46	1113.41	WLNLM		5.80	1107.72	0.61	1105.53	WLNLM		0.97	1105.18	WLNLM		5.50	1102.25	5.87	1117.20	WLNLM	WLNLM
7-Nov-16	2.14	1112.73	2.80	1112.01	0.74	1112.78	0.82	1105.32	0.76	1105.20	1.35	1104.80	1.45	1104.71	0.99	1106.76	3.22	1119.85	3.72	1119.48
17-May-17	5.37	1109.50	WLNLM		5.80	1107.72	2.51	1103.63	WLNLM		4.73	1101.42	WLNLM		4.87	1102.88	5.87	1117.20	WLNLM	WLNLM