Memo

To: Alison Soper
From: Shaun McKenna
Our reference: GP3030BE_2013 Review
Date: 28th May 2013
CC:

Subject: **2013 Review of Shotton Landfill Environmental Monitoring Results**

Dear Alison,

This memo presents a review of the environmental monitoring results generated over a 12 month period; April 2012 to March 2013 at Shotton Landfill, Permit Number GP3030BE.

This report has been generated to satisfy Condition 4.2.1(K) of the permit. The report follows the same format as those submitted in previous years.

Over the monitoring period, groundwater, landfill gas and leachate monitoring has been undertaken as required by the permit. The aim of this review is to determine if the landfill is performing as anticipated within the risk assessments submitted as part of the application process; if the landfill is complying with prescribed trigger levels set within the permit for specific substances, and whether any other substances are showing an increase as a result of landfilling activities.

This document also presents the monitoring results for five new boreholes (BH11, BH12, BH13, BH14 & BH15) that were installed in 2009 as part of the improvement programme. There are no associated trigger values for these monitoring points.

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GROUNDWATER MONITORING

Trigger levels are set at specific down-gradient boreholes for Ammoniacal Nitrogen, Nickel and Zinc. Comparison to the trigger levels is assessed over a three-event moving average.

ZINC

There have been 4 notifications with respect to elevated zinc concentrations in excess of the three-event average limit concentration; July 2012 (BH01 & BH10), October 2012 (BH01 & BH10), January 2013 (BH01 & BH10) and April 2013 (BH01 & BH10). The recorded zinc concentrations are of a similar magnitude to those recorded 2011/2012

AMMONIACAL NITROGEN

There has been 1 notification with respect to elevated ammoniacal nitrogen. A value of 1.17mg/l was recorded at BH09 in June 2012.

Elevated ammoniacal nitrogen concentrations have been recorded at BH08, BH12 & BH15. No regulatory limits have been established for these locations. The elevated concentrations are potentially indicative of an up-gradient contaminant source as demonstrated by the elevated concentrations recorded at BH12 and BH15. The concentrations recorded at these locations exceed the typical ammoniacal nitrogen content of leachate generated within Cell 2; typically 21.7mg/l (March 2007-April 2012). The average Ammoniacal nitrogen concentration recorded at BH15 during the monitoring period was 85.41mg/l.

NICKEL

There have been no reportable breaches of the trigger levels set for Nickel. Elevated Nickel concentrations are present within BH12.

LANDFILL GAS MONITORING

Landfill gas monitoring is undertaken at boreholes located around the periphery of the site as well as from leachate wells within the waste mass. Limit values are specified within the permit for Methane (1.0% v/v) and Carbon Dioxide (1.5% v/v) at Boreholes 1, 2, 8, 9 and 10.

METHANE

Methane concentrations have typically been non-detect for boreholes located around the periphery of the waste mass. Methane concentrations at BH15 average 74.09% v/v. Considering that the maximum methane concentration recorded within the waste mass over the monitoring period was 1.3% v/v (L6; Cell 2) it is considered that the elevated concentrations recorded at BH15 are as a result of natural ground conditions within the surrounding marsh.

CARBON DIOXIDE

There have been 5 occasions when carbon dioxide concentrations greater than the trigger concentration were recorded; BH1 (1), BH2 (1), BH8 (1) & BH9 (2). The recorded concentrations varied between 1.6 and 2.8% v/v compared to a limit value of 1.5% v/v. This is an improvement in comparison with the 2011/2012 dataset for which 18 separate incidents of elevated carbon dioxide occurred.

The average carbon dioxide concentrations recorded within the waste mass vary between 0.214% v/v (Cell 0), 1.34% v/v (Cell 1) and 3.8% v/v (Cell 2). The average carbon dioxide concentration recorded at BH15, located external to the waste mass was 5.43% v/v. The elevated carbon dioxide concentrations are likely to be as a result of ground gas generation within the surrounding marshland.

CONCLUSION

Assuming acceptance of external factors resulting in the breaches; the landfill is operating within the permit conditions and presenting no adverse impact to the environment.

Kind Regards,

Shaun McKenna