

Geoff Forrest
FCC Environment
Pen y Bont Landfill
Chirk
Wrexham
LL14 5AR

29 May 2015

Dear Geoff,

Re. Pen y Bont Landfill – 2015 HRA Review

The HRA submitted is generally acceptable given that landfilling operations are likely to be completed by the end of this year with capping to be completed thereafter. However, there are a number of issues that need to be addressed before we can accept the report.

We note that FCC are requesting changes to the compliance limit for ammoniacal nitrogen, cadmium, mecoprop and leachate head. For us to consider these changes some additional data interpretation is needed (explained below).

The report would benefit from an explanation of the hydraulic containment of the site and the relative elevations of the groundwater, River Dee, leachate head and landfill base. This may have been covered in previous reports, but some information would have been useful, especially as FCC aim to prove hydraulic containment once the site is capped.

The detailed comments below have followed the report for ease of reference.

- Please update terminology – numerous changes in terminology are needed throughout the report;
 - candidate Special Area of Conservation for River Dee – this is now SAC and no longer a candidate site.
 - Trigger level has changed to compliance limit.
 - Minor aquifer has been reclassified as Secondary A or B aquifer depending on geology at site.
- “Base of landfill is below the local water table...below elevation of the base of River Dee” – what are the relative differences in elevation? No mention of river base elevations or water table levels.

1. Leachate Quality

- The Limit of Detection (LOD) for naphthalene was very high for nine results – what is the normal LOD? Why was the higher value used and once noticed why were they not resampled? As the value of 40 µg/l was used this has skewed the results – given the error it might be best to remove the results from the analysis, noting the removal of values.
- Cadmium has “outlying uncharacteristic results” – perhaps these are characteristic given the extended distribution. Are there any reason for the high Cd values?
- Hazardous substances show a decrease in minimum and average values, but an increase in all maximum values. There is no time series data graphs of these substances to understand if this is an increase or decrease over the review period. Please present graphical data of this data sets.
- The extreme outlier for chloride (17,000 mg/l) – was this a one off incident and was there any reason for this for this value?
- The “highly questionable” values for phenol in 2010 – was there any reason for this elevated eight results?
- Leachate level data should have been presented with a graph for each monitoring location with each base +1 level defined. Appendix 2 has all the leachate level monitoring locations together and make interpretation difficult. Why is one hydrograph at 65 mAOD when the other are around the 40 to 45 mAOD level?

2. Groundwater

- Why have water level readings more than 30 cm above or below the next highest level been removed? With monthly monitoring of water level a change in groundwater level of 30 cm is more than likely following heavy rainfall, for example. We recommend that no groundwater level data is removed from the data set.
- What are the “attributed non-landfill sources” of mecoprop that have been detected in the groundwater?
- Note the LOD has been set above the permit limit (assume this is a compliance limit) for naphthalene – all LOD should be below the permit limit set.
- Ammoniacal Nitrogen in BH2 has been identified to have two ranges (very low and normal range) – is there a spatial and/or temporal relationship with these ranges that could account for these results?
- The comment above – is this also true for BH10, BH13 and T10?

- Trigger level (compliance limit) for T10 and T12 are exceed for chloride to 273 and 363 mg/l maximum – are these one off maximum or regular elevated above the 250 mg/l level?
- BH12, BH13 and BH14 have site specific compliance limits for chloride. BH13 maximum value does exceed the compliance limit of 320 mg/l – is this a one off occurrence during the review period or more? It is difficult to see from the summary tables.
- For T10 the compliance limit for nickel is 0.03 mg/l, but the mean and maximum results are 0.0349 and 0.079 mg/l respectively, indicating an exceedance of the compliance limit.
- There has been a steady increase in the average and maximum results for ammoniacal nitrogen, chloride, phenol and nickel during the review period. As with the hazardous substance in leachate, time series data would be helpful in determining the amount of upward trend in the results. See comment above for more detail on requirements.

3. Monitoring

- The potentially new trigger level (Compliance limits) for ammoniacal nitrogen have been suggested in table 27 for BH2, BH10, BH13 and T10 – time series data would help determine if the increase trend is rapid or slow. Please present time series data for ammoniacal nitrogen for these boreholes.
- Mecoprop increase in compliance limit to meet MRVs – noted.
- The compliance limit for cadmium is currently set at 0.5 µg/l (0.0005 mg/l). It is suggested to increase this to 1 µg/l (0.001 mg/l) – this is below EQS. Noted.
- Table 28 defines the suggest increase in leachate head in the monitoring wells. Please explain the line “2009 Modelled level (mAOD)” – is this the groundwater level or another parameter?
- Using the modelled level of 45 mAOD the degree of hydraulic containment at new CL had been calculated. For LOC01B it states a value of 3.36 m – we assume this is the difference between the proposed CL (base +2m) and the 45 mAOD, but the value given is the difference between 45 mAOD and current CL (base +1m) ($45 - 41.36 = 3.36$) – is this correct?
- We agree that the leachate depth should not be changed until the site is fully capped.

Please address the points raised above and re-submit your revised HRA report for review.

If you should have any queries, please do not hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Stuart Ross'.

Stuart Ross
Regulatory Officer, Industry Regulation Team, Natural Resources Wales
[Swyddog Rheoliadol, Tim Rheoliad Diwydiant, Cyfoeth Naturiol Cymru](#)