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Environment Agency

Pollution Control, Engineering and
Transportation Services
Walsall Metropolitan Borough Council
2nd Floor Civic Centre
Darwall Street
WALSALL
WS1 1DG

Our ref: L & T 5371

Date: 12 April 2010

Dear Sir/Madam

Environmental permit application documents for the public register.

Application Ref: EA/EPR/EP3996LF/V001 (EAWML 210029)
Operator: Bliss Sand And Gravel Company
Facility: Branton Lane Quarry Landfill, Branton Hill Lane, Aldridge, Walsall, West Midlands, WS9 0NS.

I enclose documents for your public register to add to the file referenced above.

If you have any questions please email psc@environment-agency.gov.uk.

Yours faithfully

Lesley Bhagwanji
Permitting Support Adviser

Environment Agency, PSC, EP Team, Quadrant 2, 99 Parkway Avenue, Sheffield, S9 4WF
Customer services line: 08708 506506
Email: psc@environment-agency.gov.uk
Fax: 0114 2626660

Public register transmission sheet

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Document type	Attached (✓)	Date created or received by us	No of sheets
Application for permit		/ /	
Application for variation		/ /	
Application for Surrender		/ /	
Application for transfer		/ /	
Notice requesting further information	✓	12/04/10	4
Additional information supplied by applicant		/ /	
Representations made in respect of permit or variation application		/ /	
Environmental permit, variation, transfer or surrender granted*		/ /	
Determination and decision document		/ /	
Enforcement, revocation, suspension or landfill closure notice*		/ /	
Notice withdrawing any of the above notices		/ /	
Notices, documentation, representations and determination * relating to an appeal		/ /	
Monitoring information obtained by us		/ /	
Other information given to us in compliance with permit or notice requirements		/ /	
Report published by us about environmental impact of facility		/ /	
Directions from Secretary of State or Welsh Ministers other than those relating to National Security.		/ /	
Details of relevant conviction or formal caution		/ /	
Statement relating to representations requested to be excluded		/ /	
Statement relating to monitoring information excluded on grounds of confidentiality		/ /	
Information exclusion sheet		/ /	
Other (specify)		/ /	

* Delete as appropriate

The attached documentation does not contain information relating to national security or of a confidential nature

Date sent to Register__ 12 April 2010 _____

Signature of person sending to Public Register____ Lesley Bhagwanji_____

Environment Agency

Notice of request for more information
Environmental Permitting (England and Wales) Regulations 2010

Notice requiring further information

To: Company Secretary,

Bliss Sand and Gravel Company,
Branton Hill Lane
Aldridge,
Walsall
West Midlands WS9 0NS

Application number: EA/EPR/EP3996LF/V001

The Environment Agency, in exercise of its powers under paragraph 4 of Part 1 of Schedule 5 of the above Regulations, requires you to provide the information detailed in the attached schedule. The information is required in order to determine your application for a permit, dated 24/09/2009. The information requested should be sent to the following address by 03/05/2010.

Information should be sent to

Permitting Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park,
Sheffield
S9 4WF

Signed:

Jane McNamara
Authorised to sign on behalf of the Environment Agency

Date of signing

12/4/10

SCHEDULE

ESID and Hydrogeological Risk Assessment

1. Information required: Clarification on the size of the different phases, plans of the existing and proposed landfill cells and how the phase size relates to the cell size, and how these relate to the cell sizes used in the Landsim model.

Reason: To ensure that we have a clear plan of the proposed and existing development, and so that we can be clear that the hydrogeological risk assessment applies to the correct areas.

Further details

Referring to **ESID Section 2.1.2** p7, the surface area size for the different phases is stated as follows:

Phase 1 historic landfill	27,000m^2 or 2.7 Ha	On the plans this looks bigger, c.4 to 6 Ha.
Phase 2 current landfill	32,000m^2 or 3.2 Ha	This looks correct on the plans.
Proposed Extension	77,880m^2 or 7.8 Ha	This looks correct on the plans (green outline).

For the Landsim model 'Phase 1' please clarify how this relates to the plans submitted in the ESID report. The '*no barrier*' entry in the model suggests the model 'Phase 1' applies to the plans Phases 1 + 2. The surface area in the model is given as 10.8 Ha, but we have difficulty in reconciling this with the above, and the plan areas do not seem to add up.

- 10.8 Ha (Phase 1 Landsim model), compared with:
- 2.7 Ha Phase 1 (DESID4 and report text).
- 3.2 Ha Phase 2 (DESID4 and report text).

Also in **HRA Section 1.1** the report says: *The currently permitted landfill and quarry comprises an area some 169,000m2 (17 hectares).* Again, we are having difficulty with reconciling this area with the areas above.

In the Landsim model, 'Phase 1' is stated as having 2 cells, 5.4 Ha each, that make up the total of 10.8 noted above. There don't appear to be any plans showing these cells for example DESID4 '*Site Layout and Waste Deposition*'. Please could a plan be provided to show these, or if already submitted, indicate where in the application it is located.

For the Landsim model 'Phase 2', this refers to the proposed new extension, with a 1m thick clay barrier. However, in the Landsim model the '*total base area*' of 2.88 Ha doesn't look correct:

- 2.88 Ha (Landsim model), compared with:
- 7.8 Ha Extension Phases 3, 4, 5 & 6. (DESID6, DESID10, and report text).

In the Landsim model, if one looks in the '*Edit Phase*' option, Phase 2 in the model, the Phase 2 area is stated as:

- 384m x 300m = 11.52 Ha

Whilst the information in '*Edit Phase*' may only be intended as approximate, the 2.88 Ha used subsequently in the calculations is so greatly different from this that we have to question it.

In the Landsim model, 'Phase 2' is stated as having 4 cells, base area 0.72 Ha each, that make up the total of 2.88 Ha noted above. Please could it be shown how these 4 cells relate to the 8 new phases in the proposed extension, namely Phases 3A, 3B, 4A, 4B, 5A, 5B, 6A and 6B, which on the ESID plans are shown as the area outlined in green.

2. Information required: A re-assessment of the water balance calculations that have been presented in **Section 2.3.1** '*Leachate Generation*' in the ESID report. There appear to be some flaws and inconsistencies in the calculations.

Reason: We need to be confident of the estimates of leachate head generation for two reasons: Firstly, in order that the risk assessment calculations in Landsim are valid, and secondly, so that longer term potential issues of rising leachate and over-topping ('bucket effect') have been considered. There are also calculations for optimum cell size, and it is not clear if these are correct or how they tie in with the site design. We think that a water balance for the site should consider the infiltration from effective rainfall, matched against the calculated rate of percolation/leakage out through the engineered clay barrier.

Further details

Reference to **ESID p10-11 Section 2.3.1** '*Leachate Generation'*. The calculations comprise 2 parts:

The first part is the central part of p10, and ends with the result of 4,340m^2

The second part is from ¾ of the way down p10, starting with '*Water balance calculation are also used....*' and over to p11.'

Part 1 – Optimum operating phase size.

Query 1

This appears to be a calculation to derive a maximum (optimum) phase size, in terms of surface area, that can accommodate the full annual tonnage of waste of 24,999 tonnes, but still absorb all precipitation that falls on it in the first year, i.e. without percolating out of the bottom.

For a fixed volume of waste, the bigger the surface area, the greater will be the volume of precipitation falling on it. The inference is that if this calculation is for a fixed annual tonnage, or fixed volume equivalent, then if the surface area is constrained to a given size (i.e. made smaller), then the depth of the waste must correspondingly increase. This is not explicitly stated. Please confirm if this understanding is correct, or otherwise.

The calculation is for the total absorptive capacity for 1 year, and seems to base the conclusions on that. However there appears to be no consideration of the 2nd and 3rd and subsequent years when the waste will have reached the full absorptive capacity, and leachate would then build up. Please could this be explained or addressed.

Query 2
Halfway down p10, please confirm the units for '*Average absorptive capacity*'.

If the units are [%] as stated, then:
Total annual absorptive capacity = 5% of 24,999 [tonnes]
= 1,250 [tonnes].

However, the *Total annual absorptive capacity* has units stated as [te/m^3]. Please explain what these units are, and how they appear here. The units [m^3 /tonne] are a more recognised unit of absorptive capacity.

Query 3
If the units are [litres/tonne] as indicated near the bottom of the page, then:
Total annual absorptive capacity = 24,999 [tonnes] at 5 [litres/tonne]
= 124,995 [litres].
= 125 [m^3]
This is numerically different by an order of magnitude to the result 1,250 given. If not already done so above, please explain. We think that with either Query 2 or this Query 3 there is an error that is carried through the rest of the calculations.

Query 4
Please refer to the equation:

$$\textit{Optimum operating phase size}[m^2] = \frac{\textit{Total annual absorptive capacity}[\ ?\ ]}{\textit{Total average annual rainfall}\ [m]}$$

$$= \frac{1250}{0.288} = 4{,}340\ [m^2]$$

Following through from Query 1 and Query 2, this query is again on the units of *total annual absorptive capacity*, which in turn affect the above equation.

For the equation to be valid, balancing the dimensions/units, the units must be [m^3]. If this is the case, then we think that from Query 3:

Total annual absorptive capacity = 125 [m^3] not 1250 as stated

And therefore:

Optimum operating phase size[m^2] = $\frac{125}{0.288}$ [m^3] [m]

= 434 [m^2] not 4,340 [m^2] as stated

Please could these calculations and units be re-checked. (Note this result is very small: 434m^2 = 21m x 21m cell area.)

Part 2 – Water balance calculations to determine the production of leachate

Query 5

Under 'general assumptions' at the bottom of p10, the *absorbptive capacity of the waste* is given as 5 [litres/tonne]. As for Query 2 and Query 3 above, please confirm that the units are correct.

Query 6

Please refer to the equation:

Lo = (I-E) x A – aw

Where:
- Lo = volume of leachate produced [m^3]
- I = annual rainfall [m]
- E = annual evapotranspiration [m]
- A = area of landfill [m^2]
- a = absorptive capacity of the waste [litres/tonne] or for consistency [m^3/tonne]
- w = annual waste input [tonnes]

To avoid mathematical ambiguity, and following the calculations shown on p11, this is better written as:

Lo = ((I-E) x A) – aw

And showing units, which are dimensionally correct:

Lo = ((I-E) x A) – aw

[m^3] ([m].[m^2]) - [m^3/tonne].[tonnes]

The numerical calculation is shown as:

Lo = (0.675- 0.430) x 65 x 65 – 0.05 x 24, 999

Or

Lo = ((0.675- 0.430) x 65 x 65) – (0.05 x 24, 999)

Please confirm where the 65 x 65 comes from. Presumably the product, 4,225, is a figure close to the *optimum operating phase size* 4,340 [m^2] derived earlier. However, referring to Query 4, this number may be incorrect.

Please confirm where the 0.05 comes from. If this is the *absorptive capacity of the waste* converted from 5 [litres/tonne], we think this should be 0.005 [m^3/tonne]. If this is the case then the annual leachate produced will be not:

$1035 - 1249 = -213$ [m^3]

But:

$1035 - 125 = 910$ [m^3]

A negative volume for leachate generation, namely -213 [m^3] should indicate that there are errors in the calculation, and these should be re-checked. However, even when these calculations are corrected, it is possible that there will only be a finite time before the waste becomes saturated, dependent on the hydraulic conductivity of the underlying engineered clay barrier. The value in carrying out above calculations is not clear, and needs to be clarified.

Informative

We suggest the best way to address the water balance for the site and assess the likelihood of build-up of leacheate is by using a Darcy Law calculation through the clay barrier, similar to the one carried out in **HRA Section 1.2.6 page x**. Converting the specific flow (flow per square m of barrier) into an apparent vertical column of leachate generated over 1 year, and balancing this to the annual average rainfall will provide the answer. Note that there are some simple errors with units and so forth made on **page x.** In places there are 2 sets of = signs within the same mathematical expression, which does not make mathematical sense.

We note that the existing site, Phases 1 and 2, has not historically experienced any build-up of leachate. However the proposed extension will be lined with an engineered clay barrier of lower hydraulic conductivity, and hence the hydraulic scenario is different.

3. Information required: Background groundwater hydrochemistry. The application report makes several references to the results of background groundwater sampling and hydrochemistry, but we have been unable to locate these. Please could the applicant clarify where these are located within the application, or if not present, supply the information.

Reason: The historical background hydrochemistry is key to identifying any potential future impact of the site, or alternatively demonstrating no impact.

Further details

ESID Section 1.2.2 makes reference to available monitoring data for groundwater quality since 1982, contained in ESID 4, but we have been unable to find this. **ESID Sections 2.6** states that '*background groundwater quality collected from these boreholes is summarised in Table ESID 10*' but we cannot locate **Table ESID 10** and it is not listed with the other tables on page ii of the ESID. Also, in **Section 3.5.1** p28 '*Aquifer Characteristics*' it is stated that '*groundwater hydrochemistry over the past twenty years is contained in Appendix F*". However, we are unable to find **Appendix F**.

Please could this information be supplied. The historical background and down-gradient hydrochemistry needs to be presented, with clear reference to which boreholes the monitoring data comes from. This will also help us check the validation of the Landsim model, referred to in **HRA Section 2.5.4**.

Gas Risk Assessment

4. Information required: Please revise your proposals for the number and distribution of gas monitoring boreholes for the proposed new extension. The current proposal is to install 1 gas monitoring standpipe in each phase, 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B etc. Referring to our guidance (Reference 2 below, under the heading '*Recommendations for gas monitoring'*), if the waste is to be more than 4m deep, then gas monitoring boreholes should be installed '*within the waste at a frequency of no less than no less than 2 boreholes per hectare, with a minimum of 4 boreholes per site'*. The proposed extension area is 7.8 Ha, and each of the above phases appear to be approximately 1 Ha each. Therefore the number of gas monitoring boreholes needs to be revised upwards. We acknowledge that this is dependent on the cell areas being the same as the phase areas, as discussed in request 1 earlier.

Reason: To confirm that the waste is chemically stable (i.e. inert) and that the permit conditions are being complied with.

Further Details

Please note that for the proposed new extension, perimeter gas monitoring boreholes are not a regulatory requirement.

References

1. Environment Agency (2003b), *Hydrogeological Risk Assessments for Landfills and the Derivation of Groundwater Control and Trigger Levels.* LFTGN01, Environment Agency, Bristol.

2. Environment Agency (2008), *Environmental Permitting Regulations: Inert Waste Guidance* Standards and Measures for the Deposit of Inert Waste on Lands. Published on the landfill guidance page:
http://www.environment-agency.gov.uk/business/sectors/108918.aspx

Ends