ENVIROARM LTD

12th July 2011 Our Ref: ARM/SCM/VGLF1.00/2011

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Review of Flood Risk Assessment Mitigation Measures
Soakaway Test

Further to our original proposals for flood risk mitigation at the former Vicars Grove landfill site we have since carried out a walk over survey, review of local surrounding geology and carried out soakaway tests on site.

Walkover Survey

The walk over survey has shown that during times of heavy rain that surface water runs off in all directions towards the established woodlands with no evidence of ponding and no evidence of flooding.

The restoration works once completed will further reduce surface water runoff due to increased interception evaporation and evapotranspiration from the grass cover.

The walk over survey during heavy rain also showed no low lying areas flooding.

Geological Review

The superficial deposits around the outside of the site consist of sand gravel with some clay and silt within the deposits.

This is common around the entire site. The western side is described as the Lowestoft Formation and the east as Glaciolacusterine deposits. The superficial geological map is presented at Figure 1 below.

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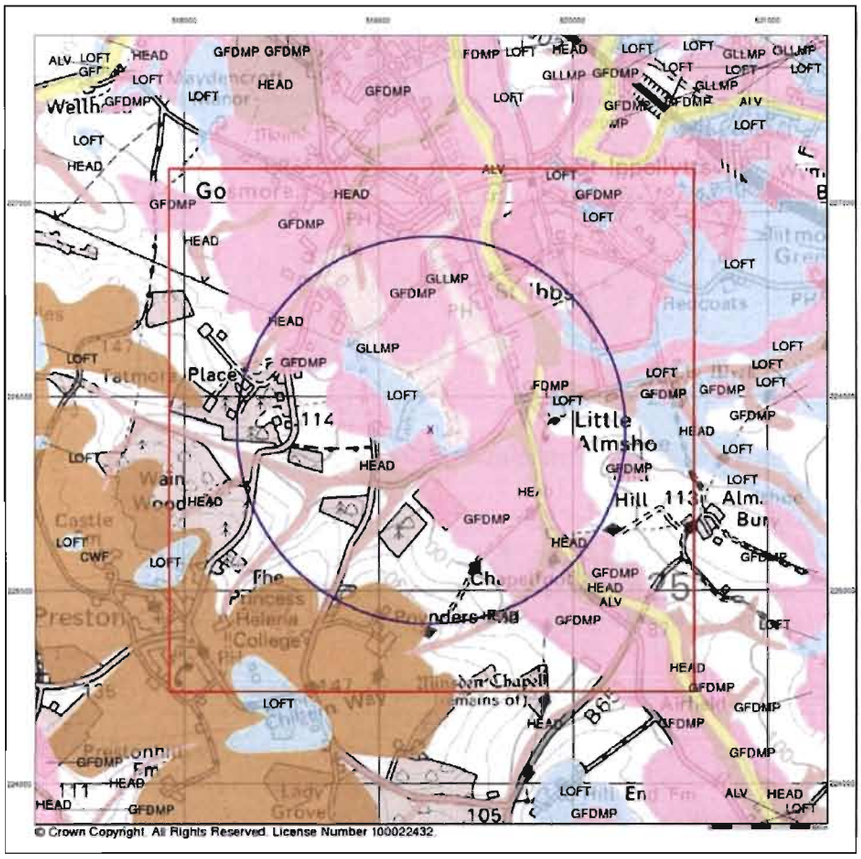
Figure 1: Superficial geology around Vicars Grove



Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Flandrian - Flandrian
	LOFT	Lowestoft Formation	Diamicton	Anglian - Anglian
	GFDMP	Glaciofluvial Deposits, Mid Pleistocene	Sand and Gravel	Ipswichian - Cromerian
	GLLMP	Glaciolacustrine Deposits, Mid Pleistocene	Clay and Silt	Ipswichian - Cromerian
	HEAD	Head	Clay, Silt, Sand and Gravel	Quaternary - Quaternary
	CWF	Clay-with-flints Formation	Clay, Silt, Sand and Gravel	Quaternary - Pliocene

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The view of trial pit 1 is shown in Plate 1 below showing the glacial sand and silt with overlying soil near to the woods.



The bedrock geology is the Holywell Nodular Chalk Formation.

Soakaway Tests

The soakaway tests were carried out in accordance with BRE Digest 365: September 1991.The locations of the three soakaway trial pits are shown on Drawing FRA 3.

The trial pits was filled with water at on the 9th June 2011.

Plate 1: View of soakaway test 2 immediately after trial pit was filled with water



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Further monitoring throughout the day was carried out to observe the fall in the water level in the pit.

The soakaway tests have taken place over 1 day and have an average measured permeability of 7.03x 10^{-6}m/s.

A copy of the soakaway test report is attached.

Conclusion

The natural surrounding ground has an intrinsic permeability based on the soakaway tests of a value of 7E-6m/s or 0.60m/d which means that flow vertically exceeds the total annual rainfall for the area. This means that the material is of medium transmissivity and will allow water seepage at a reasonable rate through the superficials, and hence no ponding was observed on site. The ground conditions surrounding the site are suitable to allow natural drainage around the entire site rather than directing runoff to two localised points as originally detailed in the FRA. To this end it is our conclusion that the removal of the ditch, grading of the top soils and early restoration would be a more suitable FRA alleviation control mechanism on the above captioned site.

If you have any comments please do not hesitate to contact me on 07801 980984.

Yours sincerely

A.R.Morris.

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CERTIFICATE

Applicant's name (person applying for planning permission) QSP
Site address Land at Vicars Grove Landfill
Date of Test 9 June 2011
Weather conditions Sun

1. **Trial Pit 1**(see attached plan identifying trial pit location).
Depth.....2.00..... metres
Length...1.50..... metres
Width.....1.00 ..... metres

Stabilising fill used No
Water table...0..... AOD

2. **Soil Infiltration Rate** (include calculations with certificate)

The soil infiltration rate is calculated by: $f = \frac{V_{p75-25}}{A_{p50} \times t_{p75-25}}$

V_{P75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth.

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including the base area.

t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Infiltration Test.....15,900 seconds.....
Soil Infiltration Rate... 5.**72E-6m/s**.....

I hereby certify that **I have carried out the above soil infiltration tests** in full accordance with the procedures specified in BRE Digest 365: September 1991, the results of which are tabulated above.

A.R.Morris B.Sc,M.Sc,C.Geol,FGS,CEnv,MCIWM

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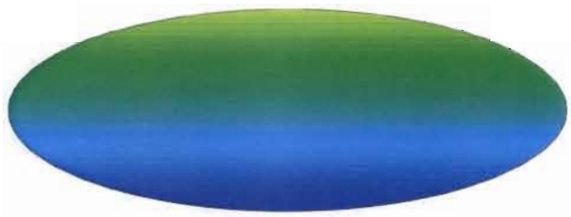

ENVIROARM LTD

CERTIFICATE

Applicant's name (person applying for planning permission) QSP
Site address Land at Vicars Grove Landfill
Date of Test 9 June 2011
Weather conditions Sun

1. **Trial Pit 2**(see attached plan identifying trial pit location).
Depth.....1.40..... metres
Length... 2.10..... metres
Width..... 1.60..... metres

Stabilising fill used No
Water table...0..... AOD

2. **Soil Infiltration Rate** (include calculations with certificate)

The soil infiltration rate is calculated by: $\mathbf{f} = \frac{V_{p75-25}}{A_{p50} \times t_{p75-25}}$

V_{P75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth.

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including the base area.

t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Infiltration Test.....605mins.....
Soil Infiltration Rate... 8.06**E-6m/s**.....

I hereby certify that **I have carried out the above soil infiltration tests** in full accordance with the procedures specified in BRE Digest 365: September 1991, the results of which are tabulated above.

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