



E176.4.073

CONTAMINATED LAND SITE DATA SHEET

Site name OVEREND QUARRY

Address OVEREND ROAD

Reference 606

H ENSINGHAM

Grid ref NX 964 156

Size 4.30 Ha

Site History

Date	Use & Occupier	Source
1865	Old Limekilns present	OS
1900	Quarry	OS
1925	Quarry Disused	OS
1938	Quarry Disused - Still	OS
1940 <sup>'s</sup>	Used as Landfill Site by Whitehaven Borough Council	E/5/14/A
1968	Tipping Site Ceased on Northern Edge of	E/5/14/A
1978	Tipping Ceased on Southern part of Site	" "
1980 <sup>'s</sup>	Area grassed, Used as P.O.S.	Planning Dept.

Summary of Site Activities Limestone Quarry, Landfill Site.

Current Use Derelict land.

Additional Comments Site Subject to detailed Contamination report - See enclosed extract.

- Further information from Environmental Health, report Number E/5/14/A.



Hospital  
Shaft A

Allotment Gardens

Gorbickle

Mensingham

St Benedict's  
RC Secondary School

Training Centre

Factory

Whitehall  
Grammar S

Overend School

St John's Church

Vicarage

Rosebank

Hospital

Homewood

Mirehouse  
West

Mirehouse  
East

High Low Hall

Lane End

The Cottage

Mineral Railway

Low Hall

Sunny Brow

Bank House

Thurnham

Cardewic

Greenbank House

Bank



9052  
271.78

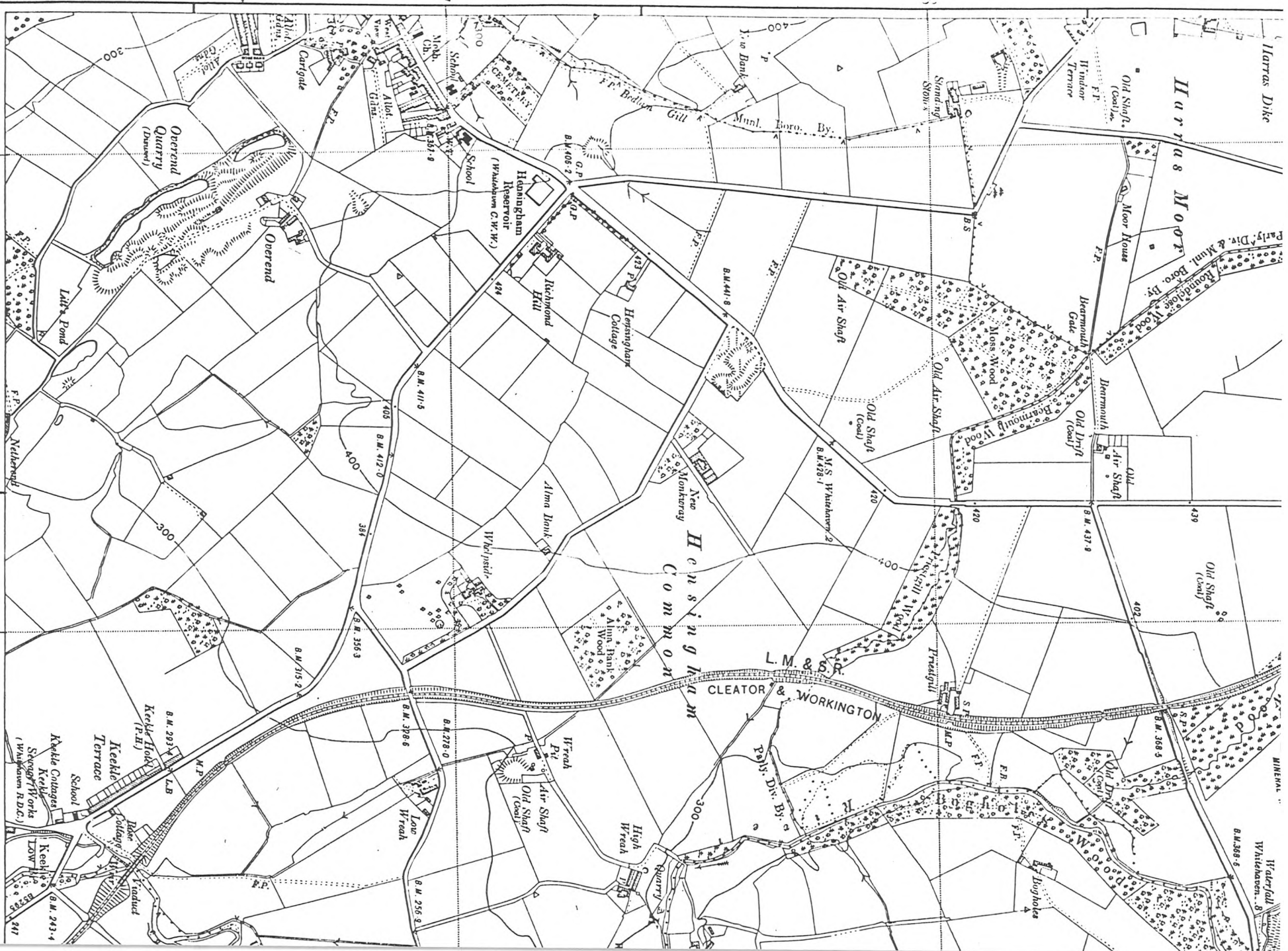
2241  
22  
Pond

37.0

3336  
3.85

2730  
00





HENSINGHAM P.H.

LONG. 3° 33' W.

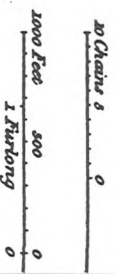
1938

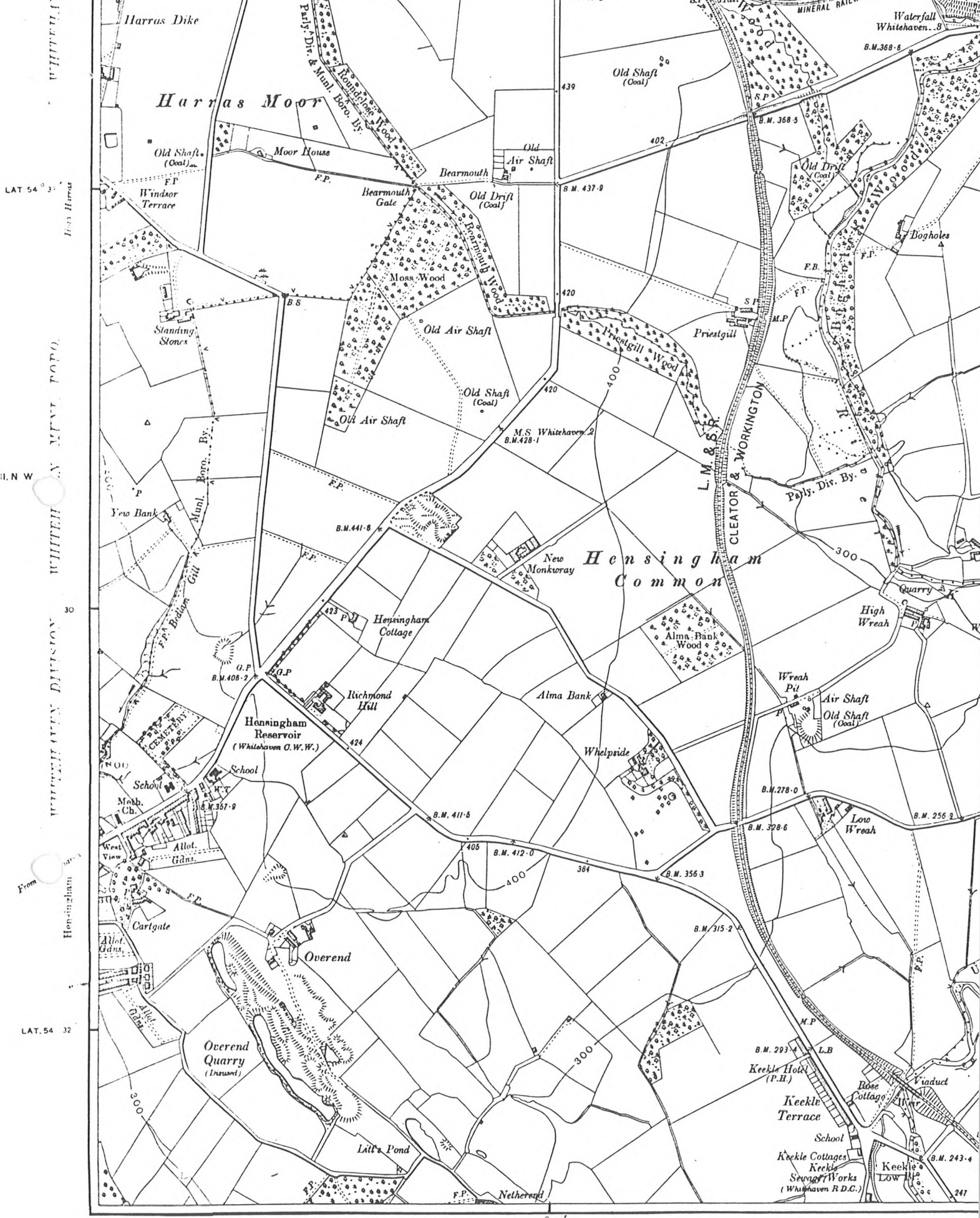
Surveyed in 1861-65. Re-levelled in 1925. Boundaries Revised to 1925.

CHARACTERISTICS AND SYMBOLS

- County Boundary .....
- Parliamentary Division Boundary .....
- Union Boundary .....
- Rural District Boundary .....
- Perish Boundary .....
- Antiquities, Site of .....
- Arrow, showing direction of flow of water. ....
- Instrumental .....
- Stashed .....

Price 2/- net.





LAT 54° 33' N  
Harras

WHITCHAMPTON DIVISION  
WHITCHAMPTON DIVISION  
H.N.W.

30

From Hensingham

LAT. 54° 32'

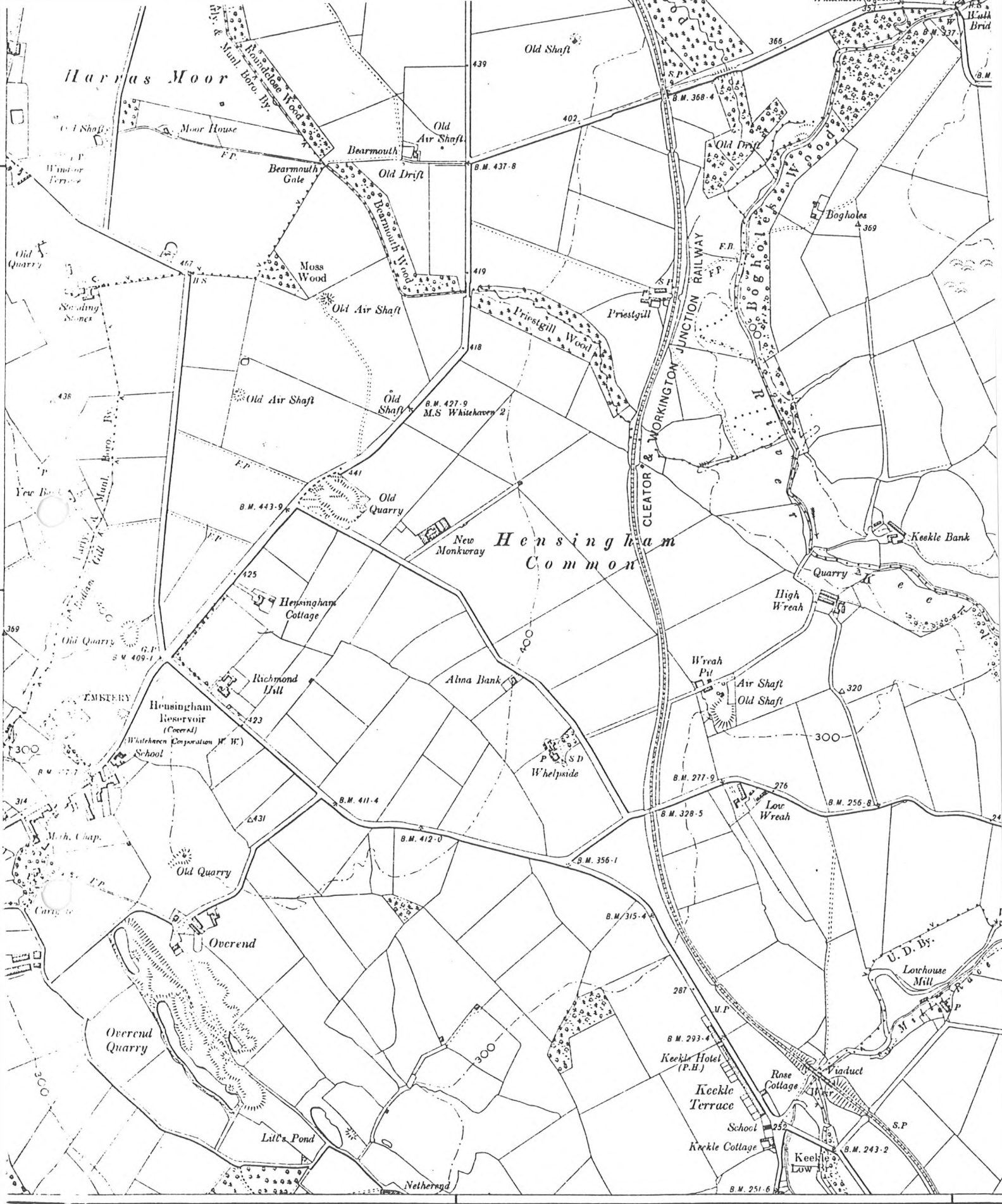
LON. 3° 33' W.

**HENSINGHAM PH.**  
 Surveyed in 1861-63. Revised in 1923. Re-levelled in 1923.  
 Reprint. 100/32, 100/35, 100/37, 100/39.

1926

County Boundary.....	Antiquities, Site of.....
Parliamentary Division Boundary.....	Arrow, showing direction of flow of water.....
Union Boundary..... x x x x	Contours { Instrumental..... 200 Sketched..... 225
Rural District Boundary..... v v v v	
Parish Boundary.....	Trigonometrical Station.....

Printed and  
 The altitudes of bench marks and surface heights



LONG. 3° 33' W.

3° 32'

Surveyed in 1860-63. Revised in 1898.  
 Reprint 50/186.

**HENSINGHAM PH.**

1900

To Cleator Moor

**CHARACTERISTICS AND SYMBOLS.**

County Boundary	Antiquities, Site of	Trigonometrical Station
Parish Boundary	Arrow, shewing direction of flow of water	
Contours (Instrumental)	For other information see Characteristic Sheet.	
Contours (Sketched)		

Heliozincographed, from 1850 Plans and Published  
 The Altitudes are given in Feet above the assumed Mean L.



1865

Old Quarry

148  
3.633

131  
2.883

129 1.746

128  
1.380

146  
4.363

*Overend*

132  
7.271

145  
5.275

127  
15.450  
*Old Limekilns*

144  
3.518

133  
2.400

143  
1.409

134  
8.435

126  
1.688

135  
3.848

125  
5.965

141  
2.289

136  
.328

140  
1.888

137  
2.740

139  
.700

*Litt's Pond*

124 2.362

138  
2.963

202  
5.045

199  
4.226

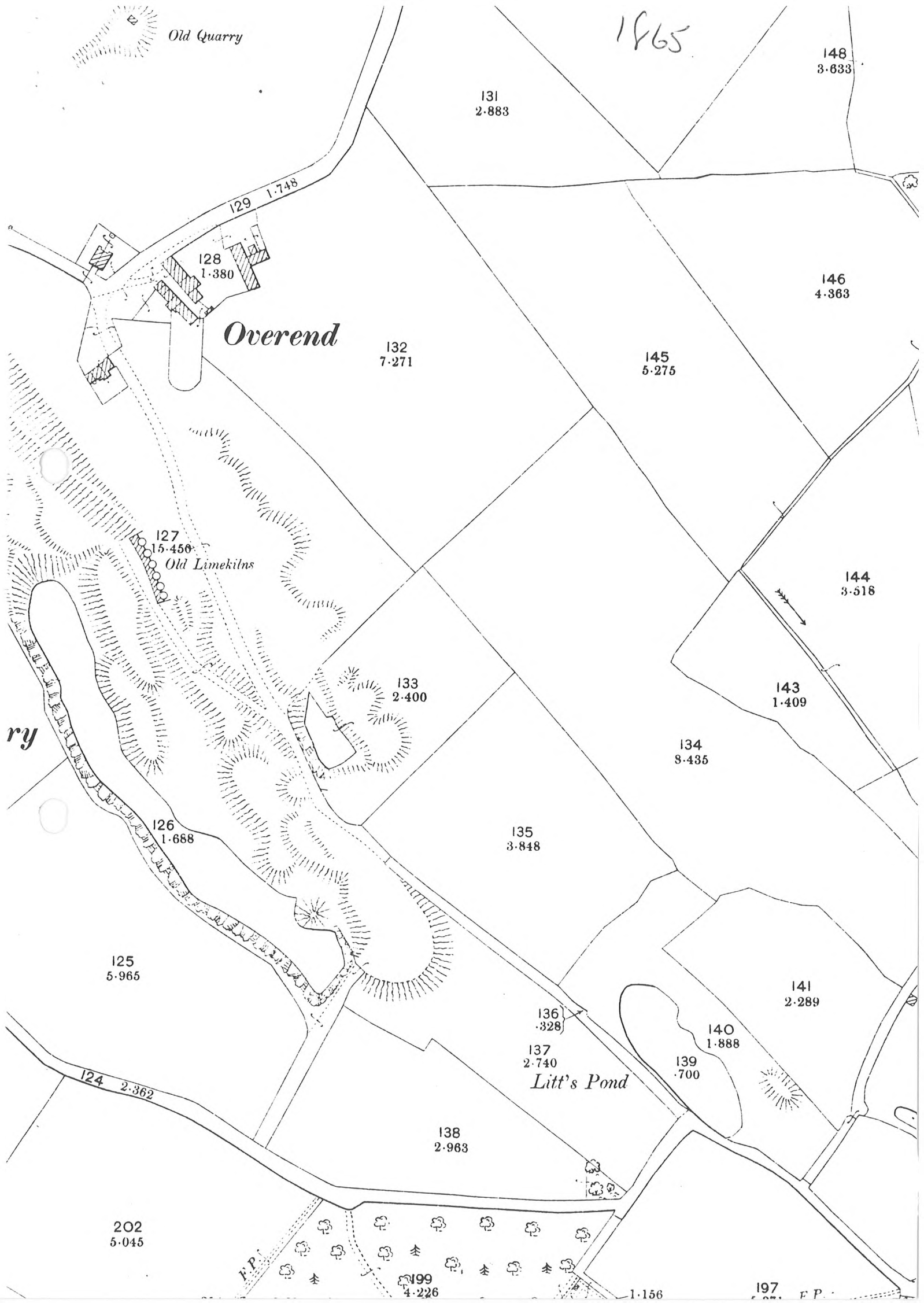
1.156

197

ry

F.P.

F.P.



8. CONCLUSIONS

1. Overend Quarry appears to have been worked for carboniferous limestone during the nineteenth century and to have laid abandoned thereafter until taken over as a landfill site by Whitehaven Borough Council in the late 1940's.
2. The site is bisected by Overend Road and, for the purposes of this report, the two parts of the site have been referred to as the southern and northern site. The northern site has been reinstated to a reasonably high standard, but the southern site is unreinstated and is poorly graded with coarse, sparse vegetation.
3. The site is within an extensively developed area with residential, commercial and recreational developments located immediately adjacent to the site.
4. The local geology is such that there is a strong groundwater flow to the south west across the site, giving rise to numerous water issues below the site as indicated in successive Ordnance Survey maps.
5. There are apparently no written records of the tipping operations at the site and, therefore, in view of the time lapse, the details remain fairly sketchy. However, it appears that tipping operations commenced in the late 1950's and continued until 1968 in the northern site and until 1978 in the southern site. The southern site has also been used until fairly recently as a transfer station for Parks Department waste.
6. The site is understood to have been operated on a controlled, i.e. compact and cover, basis, but with no preparatory works such as lining or drainage.



7. There are no written details of the waste types and sources but the tip is known to have been used for domestic, trade and commercial wastes including waste products from the Marchon Chemical Works. Known wastes include waste detergent, naphthalene, waste oil, food wrappings and foundry sand.
8. The site does not appear to have suffered from any significant problems during its working life apart from the presence of water within the quarry. It seems to have remained problem free until fairly recently when leachate outbreaks have occurred below the site.
9. In order to investigate fully the performance of the site, it would be necessary to undertake a comprehensive site investigation involving on-site and off-site boreholes and extensive sampling. The time scale and budget for this study precluded such an approach and, therefore, it was decided to undertake a less extensive investigation including strategically located on-site and off-site trial pits together with selective sampling and analysis.
10. A total of 18 trial pits were excavated on 11th and 12th February, 1988 and both water and soil samples obtained for analysis. In order to obtain the maximum information within the available time scale a structured approach was adopted for the analysis. This involved three levels of analysis, namely, comprehensive, intermediate and partial, together with a careful choice of samples for each level and the inclusion in the intermediate and partial analyses of any contaminants demonstrating high concentrations in the earlier comprehensive analyses.

11. In view of the organic nature of the waste and the detection of landfill gas during the excavation of the trial pits, it was decided that the study should include a preliminary methane survey. This was undertaken on 10th and 11th March, 1988, using a driven steel probe and a portable gas detector. Methane concentrations of up to 300% LEL were recorded at some on-site locations, but only trace amounts over the majority of the site and at the off-site locations.
12. For present purposes the results of the water and soil sample analyses have been compared to the DOE 'trigger' concentrations for the development of contaminated land and also to 'typical' analyses of soil, water and landfill leachates. The results indicate that the leachate compares closely to a typical leachate from an old (in excess of ten years) domestic landfill site. There are no significantly high results with the exception of anionic detergent and, in one case, phenols. However, there are a number of higher than 'normal' results including conductivity, sodium, zinc, lead and copper.
13. In order to assess the results of the site investigation, laboratory analyses and preliminary methane survey, consideration has been given to the factors normally affecting the generation and migration of leachate and landfill gas and to their particular relevance at the Overend Road site.
14. In view of the local geology and the lack of preparatory lining works, the site can be classified as a Class 3 or rapid migration site. This means that any leachate will be rapidly transmitted to the groundwater with little attenuation in strength thus giving a clear potential for groundwater and surface water pollution. The pollution will manifest itself in the form of a pollution plume below the site, the extent, shape and composition of which will depend upon the rate of leachate production, the leachate composition and the groundwater flow pattern.

15. The preliminary indications are that the site and the leachate are relatively uncontaminated in terms of the analysed contaminants and that, therefore, despite the onerous climatic and geological conditions, the actual pollution potential and the threat to existing developments and samples below the site may be low. However, this preliminary assessment is based upon limited information only and, therefore, a more detailed borehole investigation is advisable in order to determine more precisely the extent and composition of the leachate plume below the site.

16. With regard to landfill gas, whilst the geological conditions are not particularly conducive to gas migration, the results of the preliminary methane survey suggest the need for periodic on-site and off-site monitoring and the advisability of a borehole investigation prior to any on-site developments.

17. There are a number of remedial measures that can be implemented to control the generation and migration of leachate and landfill gas at a landfill site. These include measures to reduce the volume of leachate generated, measures to collect and, if necessary, treat the leachate and measures to collect and vent landfill gas.

18. The three main sources of water input to a completed landfill are precipitation, surface water and groundwater. In practical terms, there is little that can be done at this stage to control groundwater at the site. However, surface water inflow could be reduced by providing interceptor ditches or drains along the eastern boundary and rainwater infiltration could be reduced by regrading, landscaping and revegetation of the southern site together with selective regrading and capping of the northern site. The above measures should take into account any planned future uses for the site and could form part of an overall environmental improvement scheme (see also paragraph 22 below).



19. There are two alternative strategies that could be considered for a leachate collection system, namely, the provision of a comprehensive system effectively to prevent any further outbreaks of contaminated groundwater below the site or the provision of local leachate collection systems as and when problems arise. The latter represents a continuation of the present policy and, on the basis of the preliminary assessment, there seems to be little incentive for the expenditure of large capital sums on pre-emptive measures such as a comprehensive leachate collection system. However, the situation should be reviewed when more detailed information becomes available.
20. There are two alternatives for the disposal of the collected leachate, namely, to the local foul sewerage system or to a local watercourse. The latter would require consent under The Control of Pollution Act 1974 and this is unlikely to be obtained without pre-treatment. The former would also require consent under the Public Health Acts, but may not require pre-treatment.
21. There are a number of alternative treatments available including aerobic and anaerobic biological treatment, physical and chemical treatment, recirculation and surface spraying. The leachate at Overend Road is unlikely to be suitable for biological treatment and recirculation and surface spraying are unlikely to be appropriate, but we would advise that in the first instance every attempt should be made to secure discharge consent without the need for pre-treatment.
22. The results of the preliminary methane survey suggest the need for periodic monitoring of on-site and off-site methane concentrations, and also the advisability of a borehole methane survey prior to any on-site developments. In the first instance, we would recommend monitoring on a grid system at six monthly intervals. Methods to control methane migration could be incorporated into an overall improvement scheme and in the case of 'soft' developments could take the form of a passive venting system.

9. RECOMMENDATIONS

On the basis of our preliminary assessment, we would recommend the following:-

1. A borehole investigation to provide more detailed information on the groundwater flow pattern and on the extent, composition and effects of the pollution plume below the site.
2. The instigation of a methane monitoring programme to monitor on-site and off-site methane levels.

DCR/GW/7959