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Report No 99120/14

September 2009

SITE CONDITION REPORT
for
LANE SIDE QUARRY LANDFILL SITE
KIRKHEATON
WEST YORKSHIRE

Prepared for

P CASEY ENVIRO LIMITED
Rydings Road
Rochdale
Lancashire
OL12 9PS

TABLE OF CONTENTS

1. SITE DETAILS

1.1 General

1.1.1 The Site Condition Report (SCR) has been prepared by The Arley Consulting Company Limited (TACCL). This report has been prepared using the guidance and templates produced by the Environment Agency (EA) and fulfils the requirements for the environmental permit application Part A, Section 5D.

1.1.2 The aim of this report is to describe Lane Side Quarry in relation to the environmental setting, identifying the source terms, pathways and receptors that will be used as the basis for the risk assessments, including:

- Hydrogeological Risk Assessment
- Landfill Gas Risk Assessment
- Nuisance and Health Risk Assessment
- Stability Risk Assessment

1.1.3 Each of the risk assessment reports includes a more specific conceptual model, based upon the general information contained within this report.

1.1.4 The applicant for the environmental permit is P Casey Enviro Limited (PCE), 121 Buckley Road, Rochdale, Lancashire, OL12 9DL.

1.1.5 The site for which the application is being made is Lane Side Quarry, off Bellstring Lane, Kirkheaton, West Yorkshire. The National Grid Reference for the centre of the site, excluding the entrance road, is SE 1880 1745. A site location plan is presented as Drawing No 99120/128.

1.1.6 The application is for a bespoke environmental permit for the disposal to landfill of non hazardous wastes at Lane Side Quarry.

1.1.7 The site has planning permission for reclamation/restoration to woodland and wildflower meadow by landfilling, which was granted on appeal by the Planning Inspectorate. The planning conditions, dated 26 May 2000, are presented in Appendix A of the ESID.

1.2 Site Location & Description

1.2.1 Lane Side Quarry is located approximately 0.5 km to the east of the village of Kirkheaton, some 3.5 km to the east-north-east of Huddersfield, West Yorkshire.

1.2.2 The approximate National Grid Reference for the centre of the site excluding the entrance road is SE 1880 1745. The site location is illustrated on Drawing No 99120/128.

1.2.3 Access to the site is off Bellstring Lane, to the north-east.

1.2.4 The site is located within an existing quarry set in a predominantly rural area. The landfill area is bounded to the south by Lane Side Lane, beyond which is predominantly farmland extending some 80 to 180 m, to Ox Field Beck, and beyond. A number of isolated residential properties are situated immediately to the south of Lane Side Lane.

1.2.5 A cemetery and allotments are situated to the south-west of the site. Further west are residential properties off Stafford Hill Lane, Mountain Way and Orchard Road.

1.2.6 A large area of farmland is situated to the north; this land extends to Cockley Hill Lane. A number of residential properties and farm buildings are situated to the south of Cockley Hill Lane, within approximately 250 to 300 m of the site boundary.

1.2.7 The eastern boundary of the landfill site is currently marked by Cockley Hill Beck, a small stream which is located in a deep steep sided valley. As part of the proposed landfill development PCE has permission to divert the beck around (to the north and west) of the proposed landfill site. The land immediately to the east of the stream includes other areas of the existing quarry and an old restored landfill site, Kirkheaton Brickworks Landfill Site, beyond which is more farmland.

1.2.8 A series of benches, comprising unworked or partially worked areas and stockpiles of fill mark the base of the quarry. The rock benches are controlled by the geology; they dip gently towards the east.

1.2.9 Three ponds are situated within the quarry base. These are primarily fed by surface runoff from within the quarry, but may also be indicative of local groundwater conditions.

1.2.10 Steep batters formed in the natural strata mark the northern edge of the main quarry. Weathering of the exposed rock faces has produced large scree deposits that obscure the lower sections of these batters.

1.3 Proposed Site Layout & Facilities

1.3.1 The proposed site layout and facilities are described in Section 1.2 of the ESID and are illustrated on appended drawings.

1.4 Compliance with the EA's Position Statement on the Location of Landfills

1.4.1 The new site is not located on a major aquifer. The site is located above a confined minor aquifer. Further information is presented in the Hydrogeological Risk Assessment.

1.4.2 The site is not located in a currently defined Source Protection Zone and is not below the water table.

1.5 Potential Receptors

1.5.1 The location of the site in relation to potential receptors is shown on the Drawing No 99120/127. This identifies environmental receptors within 500 m of the site boundary.

1.5.2 The identified receptors are summarised in Table 1 of the ESID. Receptors located further than 500 m from the site boundary are not considered to be at risk from the activities.

1.5.3 The nearest residential properties are to the south and west of the site. The nearest controlled waters are groundwater beneath the site and Cockley Hill Beck located to the east.

1.6 Habitats

1.6.1 According to the Conservation (Natural Habitats) Regulations 1994 (referred to as "the Habitats Regulations") an assessment is required if the site lies within 2 km of a designated European Site. In extension, if the activity could attract gulls or corvids an assessment must be carried out if it falls within 5km of a European Site.

1.6.2 The proposed Lane Side Quarry Landfill Site is not situated within 5 km of any habitat covered by these regulations.

2. CONDITION OF THE LAND

2.1 Site History

2.1.1 Selected Ordnance Survey (OS) maps for the site are appended to the ESID. These maps illustrate significant changes in the nature and condition of the site over the 150 years. The site has a history of mining and quarrying. In the late 1800's and early 1900's the site was mined for coal and fireclay; since this time the site has been quarried for brickmaking.

2.1.2 The earliest available maps, date from 1854; these indicate that the site and the surrounding land was used primarily for agricultural purposes at this time. Small isolated 'sandstone quarries' are situated throughout the agricultural land and probably generated stone for walling as part of the enclosure of fields.

2.1.3 The 1893 edition map still shows the site as generally agricultural land although two 'Air Shafts' are shown within the site and to the north-west and the area later occupied by Kirkheaton Brickworks Landfill Site is marked as an 'old coal pit' with associated 'refuse heaps' and an 'Old Shaft'. A 'Mortuary Chapel' and 'Cemetery' are situated on land to the south-west of the site.

2.1.4 By 1919 the 'Air Shaft' within the site itself is marked as 'Old' and there is an adit, marked 'Old Coal Level' to the south of the proposed landfill site.

2.1.5 A large building, situated in the southern part of the site adjacent and to the west of Cockley Hill Beck, is shown on the 1948 edition map. On later editions the building is labelled 'Works' (1956 - 1961) and 'Brickworks' (1970). The 1961 and 1970 edition OS maps illustrate an expansion of quarrying activities particularly to the east and north of the brickworks building. The extents of the 'clay pit' are marked by 'cliffs' shown on these maps.

2.1.6 Subsequent maps covering the period 1989 to 2008 provide less detail but indicate restoration of the clay pit to the east of the brickworks as well as an expansion of the clay pit to the north-west and north-east.

2.1.7 It is known, from other sources, that the section of 'clay pit' to the south-east of the proposed landfill site was restored by landfilling controlled wastes during the 1970's and 80's although the OS plans provide no clear supporting information.

2.1.8 Quarrying at the site ceased in 2001.

2.2 Geology

2.2.1 The regional geology has been established from published geological maps.

2.2.2 An extract from the published geological map showing the regional geology is presented as Drawing No 99120/129. In addition a Geology Report has been supplied by Landmark, a copy of which is presented in the ESID.

2.2.3 From the published geological information it can be seen that the geology of the area consists of east-south-easterly dipping rocks of the Carboniferous Westphalian A series (formerly the Lower Coal Measures). The actual sequence of strata extends from the Grenoside Rock to the Shertcliffe Coal and Seatstone at Bellstring Lane.

2.2.4 A number of site specific ground investigations have been carried out at and around the site. Copies of the Borehole and Trial Pit Records are presented in the ESID; exploratory locations are illustrated on Drawing No 99120/130.

2.2.5 The geological information, drilling observations and in situ test results from the investigations have been used to assess the existing site conditions, particularly in the area of the proposed containment landfill site, and confirm the environmental setting. Additional details are presented in the ESID and HRA.

2.3 Mining and Quarrying

2.3.1 The proposed landfill site is situated within a former brickworks clay pit. The geology comprises a sequence of easterly or south-easterly dipping Carboniferous Coal Measures strata including coal seams.

2.3.2 The records relating to the site indicate that, as well as the surface quarrying of predominantly mudrocks for brick making, the site has also been mined by underground means for the extraction of both coal and fireclay.

2.3.3 The records indicate that there are shallow mine workings and mine entries in the vicinity of the site. Further details are presented in the ESID.

2.3.4 The main coal seam present at the site is the Better Bed, which is located at approximately 75 to 95 m AOD, in the base of the main quarry area and mine workings have been proved in this seam for both the coal and fireclay, together with a series of adits and shafts.

2.3.5 The mine workings within the Better Bed coal seam underlie the proposed landfill site. Both coal and fireclay has been worked giving a combined seam thickness of 1.98 m. These areas require stabilisation by treatment of the shallow coal mine workings.

2.3.6 The Coal Authority has identified 5 shafts and 11 adits at the site. Two shafts underlie the proposed landfill site, although one of these, an air shaft located in the north-western section of the phase, may have been removed by quarrying.

2.3.7 An adit is also situated at the south-eastern end of the proposed landfill site. These three mine entries will require further investigation and treatment as part of the development works.

2.4 Hydrogeology

2.4.1 The site is located in a quarry excavated into Coal Measures strata which according to the EA "comprise a complex sequence of mudstones, sandstones, siltstones, seat earths and coals".

2.4.2 The Coal Measures are classified as a minor aquifer. Minor aquifers of this type are defined as being "formations of variable permeability, but important for local abstractions" and "fractured without high intergranular flow".

2.4.3 The site is not within a currently defined groundwater source protection zone. There are three licensed groundwater abstractions in the vicinity of the site; specific details are presented in the ESID.

2.4.4 Due to their locations and the hydrogeological conditions it is highly unlikely that these abstractions would be adversely affected by the proposed landfill site.

2.4.5 According to Kirklees Metropolitan Council reports "there are no registered supplies within a 3 km radius of Lane Side Quarry, Kirkheaton".

2.4.6 Groundwater levels have been measured in the monitoring boreholes installed at the site. The water table varies between approximately 107 m and 83 m AOD in the vicinity of the site. Flows are typically towards the south-south-west towards Ox Field Beck.

2.5 Hydrology

2.5.1 The site is located within the catchment of Ox Field Beck although the closest surface water stream is Cockley Hill Beck which is situated immediately to the south-east of the site.

2.5.2 The available information suggests that the water in Cockley Hill Beck is probably not linked to the local groundwater at both the main water table beneath the landfill site. However it is clear that surface water runoff from the surrounding farmland contributes significantly to stream flow in the beck.

2.5.3 The water in the ponds situated in the base of the quarry is at a similar level to the main water table.

2.5.4 Cockley Hill Beck flows beneath Lane Side Lane to it's confluence with Ox Field Beck, some 250 m to the south of the landfill site.

2.5.5 Ox Field Beck flows in a westerly direction and discharges into Fenay Beck some 600 m to the west-south-west of the site. Water in Fenay Beck is classified as good quality (Class B) according to the GQA Scheme.

2.5.6 There are no licensed surface water abstractions within a 2 km radius of the site.

3.5.7 The site is elevated above the indicative flood plain of the Ox Field Beck and is not at risk of flooding.

2.6 Pollution History

Mining and Quarrying

2.6.1 The proposed landfill site is situated within a former brickworks quarry. Records indicate that the site has been worked as a surface quarry predominantly for the extraction of mudrocks for brick making. In addition the site has also been mined by underground means for the extraction of both coal and fireclay.

2.6.2 The presence of both the mine workings and the mine entries provide a potential source of pollution as well as links to controlled waters.

2.6.3 Further details relating to the mining conditions at the site are presented in the ESID.

Historic Waste Disposal Activity

2.6.4 An old restored landfill site (Kirkheaton Brickworks Landfill Site) is located to the south-east of the proposed landfill site, beyond Cockley Hill Beck.

2.6.5 Further details relating to Kirkheaton Brickworks Landfill Site are presented in the ESID.

General Incidents

2.6.6 The agricultural land use within the vicinity of the site may give rise to non-landfill related contamination.

2.7 Baseline Conditions

2.7.1 Ground Conditions

2.7.1 From the investigations carried out at the site it is apparent that the soils and rock within the landfill area generally comprise in situ rock strata with some made ground consisting of reworked soils and rocks generated as part of the quarrying process.

2.7.2 There is no evidence of ground contamination within these strata.

2.7.3 There are shallow underground mine workings immediately beneath the proposed landfill site and mine entries. These require stabilisation by a combination of excavation and drilling and grouting.

2.7.2 Groundwater Conditions

2.7.2.1 Groundwater is present beneath the proposed landfill site. Groundwater flow is to the south-south-west, probably contributing to the base flow of Ox Field Beck.

2.7.2.2 Groundwater has been sampled from monitoring boreholes up and down gradient of the site to determine the background groundwater conditions. The results of the groundwater analyses are presented in the ESID and are discussed and assessed in the Hydrogeological Risk Assessment.

2.7.2.3 From the results it can be seen that generally the determinand concentrations are quite consistent between the sampling locations.

2.7.2.4 The current groundwater quality at the site is good and there is no evidence of background contamination from any of the possible sources including the quarry, underground mining, agricultural sources or Kirkheaton Brickworks Landfill Site.

2.7.3 Surface Water Conditions

2.7.3.1 The EA has provided information relating to the surface water quality in the area, although no information is available for Cockley Hill Beck or Ox Field Beck, to the south.

2.7.3.2 Samples have been recovered from Cockley Hill Beck up and down gradient of the site to determine the background groundwater conditions. Samples of pond water have also been recovered for analysis.

2.7.3.3 The results of the groundwater analyses are presented in the ESID and are discussed and assessed in the Hydrogeological Risk Assessment.

2.7.3.4 From these results it can be seen that the range of results obtained for each of the sampling locations are relatively consistent.

2.7.3.5 The current groundwater quality at the site is good and there is no evidence of background contamination from any of the possible sources including the quarry, underground mining, agricultural sources or Kirkheaton Brickworks Landfill Site.

2.7.4 Landfill Gas

2.7.4.1 Gas monitoring boreholes have been installed in and around Lane Side Quarry to facilitate background monitoring.

2.7.4.2 The monitoring results obtained to date are presented in the ESID and have been summarised in the landfill gas risk assessment (TACCL Report No 99120/19)

2.7.4.3 The results indicate that background gas concentrations of up to 3.5% (methane) and 8.8% (carbon dioxide) have been measured at the site.

2.7.4.4 These elevated background gas concentrations are probably a result of natural organic rich strata including shallow underground coal; the concentrations measured are typical of sites within the Coal Measures geological strata.

2.7.4.5 The Kirkheaton Brickworks Landfill Site is also a potential source of landfill gases. The old landfill may be a minor constituent of the background gas concentrations particularly in boreholes immediately adjacent.

3. PERMITTED ACTIVITIES

3.1 The application is for the operation of a non hazardous waste landfill site; this is a permitted activity which will be controlled by specific permit conditions.

3.2 In addition the application also covers the treatment of inert and excavation wastes which will be controlled and regulated by a standard rules permit. Specific details are presented in TACCL Report No 99120/24.

3.3 Other relevant activities associated with the landfill site and waste treatment facility include the management and control of landfill gas and leachate.

3.4 The application includes proposals for storage and biological treatment of leachate prior to discharge to sewer. Specific details, including layout drawings, are presented in the ESID.

3.5 An H1 assessment of the leachate treatment plant is presented in Volume 1 of the application (Additional Information).

3.6 Landfill gas will be managed by extraction and flaring, although when production rates allow gas will be utilised to generate electricity. Details are presented in the Landfill Gas Risk Assessment (TACCL Report No 99120/19).

4. CHANGES TO THE ACTIVITY

4.1 Not completed at application stage.

5. MEASURES TAKEN TO PROTECT LAND

5.1 Not completed at application stage.

6. POLLUTION INCIDENTS THAT MAY HAVE HAD AN IMPACT ON LAND, AND THEIR REMEDIATION

6.1 Not completed at application stage.

7. SOIL AND GROUNDWATER QUALITY MONITORING

7.1 Not completed at application stage.

8. DECOMMISSIONING AND REMOVAL OF POLLUTION RISK

8.1 Not completed at application stage.

9. REFERENCE DATA AND REMEDIATION

9.1 Not completed at application stage.

10. STATEMENT OF SITE CONDITION

10.1 Not completed at application stage.

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