Report

Ecologia™
experts on the ground

Title: Phase 1 Desk Study and Walkover Report for Rudyard Road Service Station, Rudyard Road, Biddulph Moor, Stoke on Trent ST8 7JD

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EXECUTIVE SUMMARY

Site location	Rudyard Service Station, 5 Rudyard Road, Biddulph Moor, Stoke on Trent, ST8 7JD.
Site description	The site under investigation is accessed from Rudyard Road. The site has already been commercially developed and consists of one building which is used as a car repair garage and has been split into three workshops with a trade counter and office. A tarmac parking area is located at the front of the building to the south-east which provides parking and access to the workshops and an area of rough ground with no hard standing is at the rear of the building to the north-west.
Reason for investigation	Ecologia understands a contaminated land assessment is required in support of a planning application for the re-development of the garage buildings.
Geology/hydrogeology	The Envirocheck™ report shows the site under investigation to be located over a minor aquifer with soils of a low to intermediate leaching potential. The site is not within a groundwater source protection zone but is located within a CAMS area. The Envirocheck™ report describes the bedrock at the site as Cheddleton Sandstone part of the Millstone Grit Group. Superficial deposits are listed on the Envirocheck report on site as low permeability deposits comprising of head, clay-with-flints, brick earth, peat, river terrace deposits and marine and estuarine alluvium.
Site history	The site has been used as a car repair garage for approximately 40 years. In addition to car repairs, historically the garage was also used to dispense fuel, however the fuel storage tanks were decommissioned circa 1989, filled with concrete and the pumps removed.
Possible sources	The walkover and desk study highlighted the potential for low level contamination resulting from potentially contaminative land use at the property. These include total petroleum hydrocarbons (TPH), BTEX compounds (benzene, toluene, ethylbenzene, xylenes), metals, metals and semi metals.
Possible receptors	Possible receptors identified were the ground workers during the construction of the property. Future users of the site are unlikely to be at risk. There is potentially a low risk to the groundwater beneath the site.
Recommendations	The walkover and desk study highlighted the potential for low level contamination resulting from potentially contaminative land use at the property. Risk to human health during the construction phase of the development when access to the potentially contaminated soils is unrestricted could be possible. The proposed use of the site remains that of a garage. The risks to human health from any contaminated soils beneath the site are therefore low as the majority of the site will be either taken up by the foot print of the new building or covered in hard standing. The risk of any significant impact on groundwater is low given that the site is located over a minor aquifer, with variable permeability and superficial soils with a low to intermediate leaching potential. We therefore conclude, based upon the information used in this report from the desk study, the walkover survey and the proposed use of the site as a garage that although a potential pollution linkage exists the risks to the identified receptors are low. We therefore recommend consultation with the local authority is undertaken to determine whether the above information is satisfactory or whether further investigation works will be required at the property. It is also recommended that bunded storage areas should be incorporated into the design of the new development to ensure the potentially hazardous products such as oils are stored safely.

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Appendix I: Photographic Report

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1 Introduction

1.1 Background

Ecologia was appointed by Mr Booth to conduct a Phase I Site Investigation, (Desk Study and Walkover Survey), at Rudyard Service Station, 5 Rudyard Road, Biddulph Moor, Stoke-on-Trent, ST8 7JD.

Ecologia understands a contaminated land assessment is required in support of a planning application (UT/2009150482/02-L01) for the re-development of the existing service station into a new service station.

This desk study is based on current best practice as set-out in Investigation of Potentially Contaminated Sites - Code of Practice BS10175 (2001), Procedures for the Management of Land Contamination (Environment Agency, CLR 11) and Guidance for the Safe Development of Housing on Land affected by Contamination (Environment Agency & NHBC).

This report details the findings of the desk study, which is interpreted in conjunction with findings of a site walkover visit conducted on Monday the 20th of April 2009.

1.2 Objectives

The objective of the work is to produce a preliminary risk assessment for the site based upon a conceptual model derived from a review of available information and a site walkover. The preliminary risk assessment will be used to define the required parameters and scope of any site investigation should it be required.

The programme of work for the Phase I site investigation included the following:

- A search of the Envirocheck™ database.
- Review of the site history.
- Review of geological information.
- Review of groundwater vulnerability and flood map information.
- Site walkover survey.
- Assessment of the future use of the site in terms of risk receptors.
- Development of a conceptual model.
- Design of any required intrusive investigation.
- Interpretive report.

2 Site Description & Walkover Survey

2.1 General

The site address is:

Rudyard Service Station

5 Rudyard Road

Biddulph Moor

Stoke-on-Trent

ST8 7JD

The site is centred at grid reference 390760, 358260.

The location of the site is shown in Figure 1 and the approximate outline of the development area (outlined in red) is shown in Figure 2.

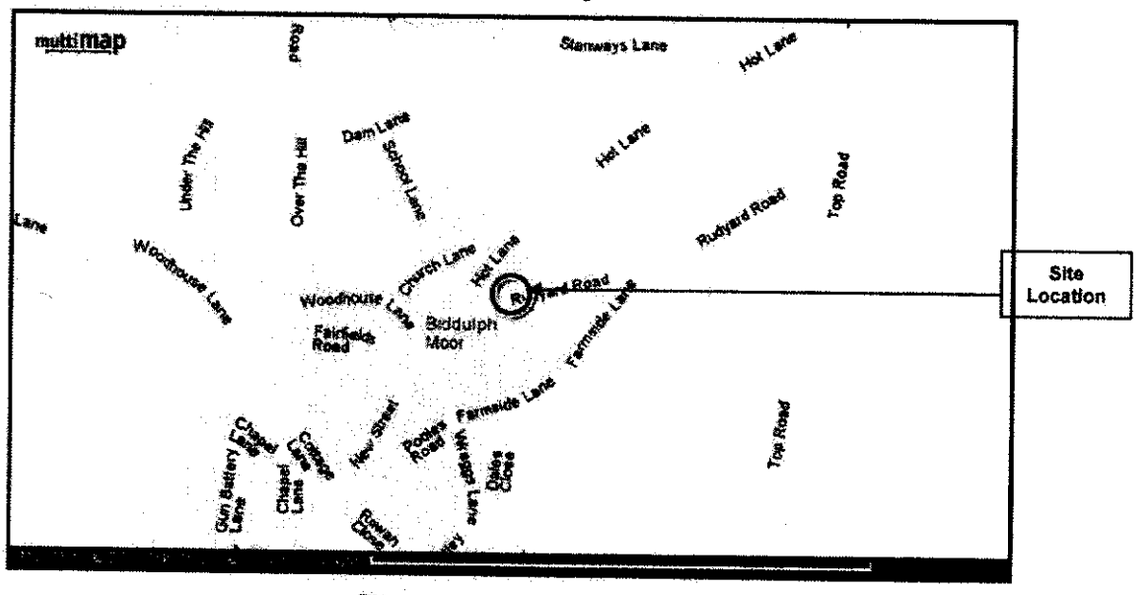


Figure 1: Location Map.

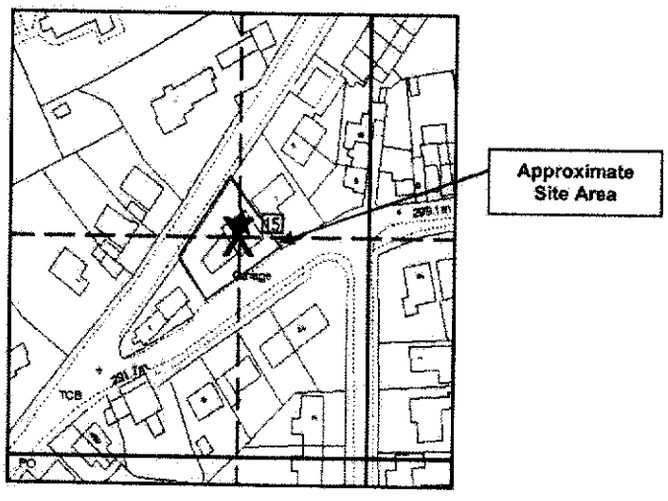


Figure 2: Approximate Proposed Development Area

2.2 Site Walkover Survey

A walkover survey was conducted on Monday the 20th of April 2009. The walkover was attended by Chris Williams of Ecologia. The findings of the walkover survey are presented within this report.

2.2.1 Site Setting

The site is located off Rudyard Road in Biddulph Moor. The surrounding area is primarily residential.

2.2.2 General Site Description

The site description should be read in conjunction with the photographic report presented in Appendix I.

The site under investigation is accessed from Rudyard Road. The site has already been commercially developed and consists of one building (Plate 1) which is used as a car repair garage and has been split into three workshops with a trade counter and office. A tarmac parking area is located at the front of the building to the south-east which provides parking and access to the workshops (Plate 2). There is an area of rough ground at the rear of the building to the north-west (Plate 3).

Adjacent to the site to the north, east, south and west are residential houses (Plates 4, 5, 6 and 7).

Mr Booth indicated that two (No. 2) direct fill underground storage tanks were located near the south-west site boundary (Plate 8) and that the pumps were located in the tarmac at the front of the property adjacent to Rudyard Road. Two (No. 2) vent pipes are located on the south-western elevation of the building (Plate 9). Mr Booth also reported that these underground tanks were installed 40 years previously and used solely for petrol. The tanks were decommissioned and filled with concrete approximately 20 years ago circa 1989. The tanks were

A waste oil storage area is located near the north-west site boundary (Plate 10). In addition to waste oil, a number of other potentially hazardous products are stored at the property including synthetic oils, thinners, brake fluid, degreasers, waxes, cleaning products and paints (Plates 11, 12, 13 and 14). A number of Liquid Petroleum Gas (LPG) bottles are present which are used to power heaters (Plate 15). A skip containing scrap metal is located in the north-east corner of the property (Plate 16).

No surface water features were observed during the walkover survey.

3 Site Information

In order to provide a comprehensive assessment of the site, a report on the potential environmental receptors and hydrological sensitivity of the area, was commissioned from Envirocheck™.

The full report is included in Appendix II however the key information is outlined below.

3.1 Hydrogeology / Geology

The Envirocheck™ report shows the site under investigation to be located over a minor aquifer (variably permeable). These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies an in supplying base flow to rivers. The soils in this area are classified as having a low leaching potential, pollutants are therefore unlikely to penetrate the soil layer because they have a large ability to attenuate diffuse pollutants and/or because water movement is largely horizontal.

The Envirocheck™ report shows the site is not located within a groundwater source protection zone. This is in agreement with information obtained from the Environment Agency website (Figure 3).

The site is located within a CAMS area (Catchment Abstraction Management Strategy), an area where water resources are managed.

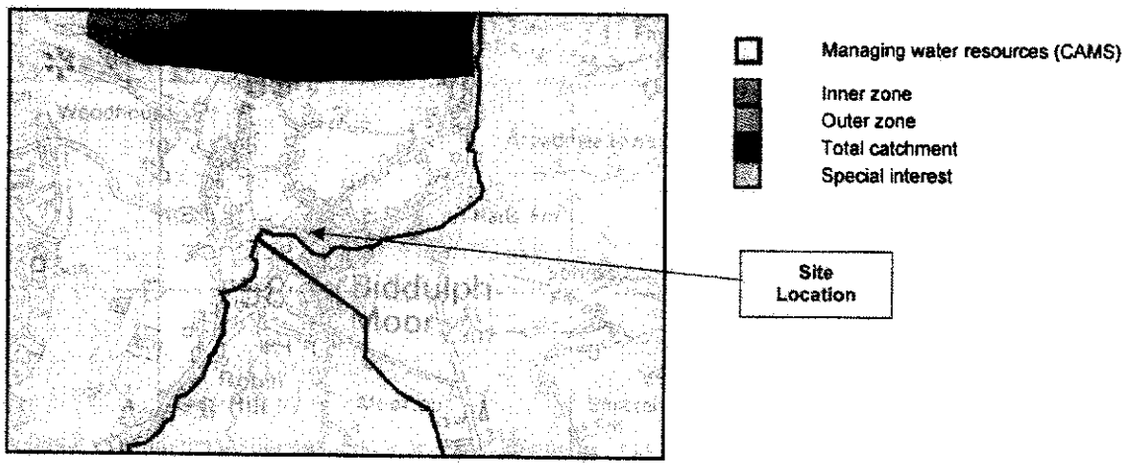


Figure 3: Groundwater Source Protection Zones and CAMS

The Envirocheck™ report identifies one (No 1) surface water features within 1km of the site a small unnamed tributary of Biddulph Brook located 223 m to the north the site.

3.1.1 Flooding

The Envirocheck™ report does not identify the site as being susceptible to flooding or extreme flooding.

Information obtained directly from the Environment Agency website is in agreement with the information from the Envirocheck™ report (Figure 4).

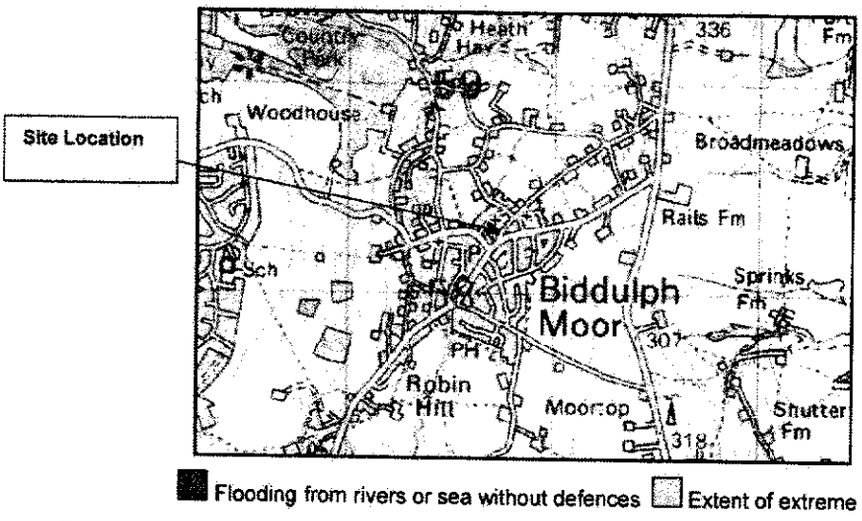


Figure 4: Surface Water Flood Map from the Environment Agency Website

The Envirocheck™ report describes the bedrock at the site as Cheddleton Sandstone part of the Millstone Grit Series. Superficial deposits are listed on the Envirocheck report on site as low permeability deposits comprising of head, clay-with-flints, brick earth, peat, river terrace deposits and marine and estuarine alluvium.

Information from the British Geological Survey (BGS) website is in agreement with this information.

A map of the bedrock and superficial deposits from the British Geological Society website is presented within Figure 5.

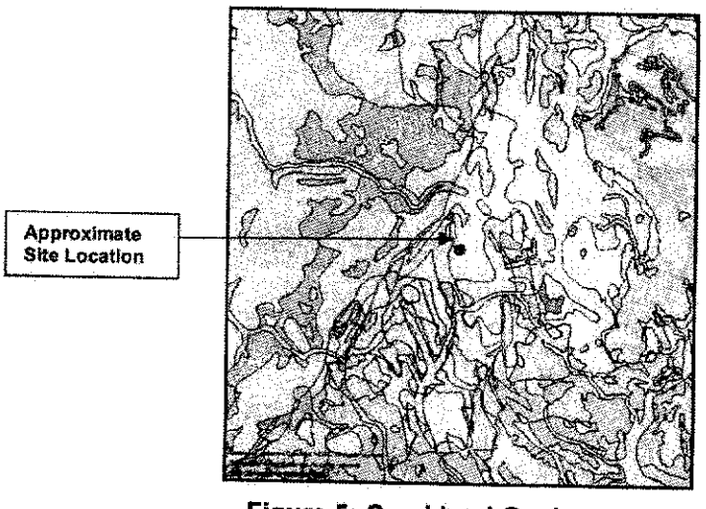


Figure 5: Combined Geology map

Superficial deposits	
	DRIFT GEOLOGY NOT MAPPED [FOR DIGITAL MAP USE ONLY]
	ALLUVIUM
	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)
	BRICKEARTH
	TILL
	CLAY-WITH-FLINTS
	GLACIAL SAND AND GRAVEL
	SAND AND GRAVEL OF UNCERTAIN AGE AND ORIGIN
	LANDSLIP

Bedrock geology	
	WARWICKSHIRE GROUP - SILTSTONE AND SANDSTONE WITH SUBORDINATE MUDSTONE
	WARWICKSHIRE GROUP - MUDSTONE, SILTSTONE, SANDSTONE, COAL, IRONSTONE AND FERRICRETE
	PENNINE LOWER COAL MEASURES FORMATION AND SOUTH WALES LOWER COAL MEASURES FORMATION (UNDIFFERENTIATE
	PENNINE MIDDLE COAL MEASURES FORMATION AND SOUTH WALES MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIA
	PERMIAN ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
	PENNINE UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE, SANDSTONE, COAL, IRONSTONE AND FERRICRE
	MILLSTONE GRIT GROUP [SEE ALSO MIGR] - MUDSTONE, SILTSTONE AND SANDSTONE
	LIAS GROUP - MUDSTONE, SILTSTONE, LIMESTONE AND SANDSTONE

3.2 BGS Recorded Mineral Sites

There are no known recorded mineral sites within a 1 km radius of the site.

3.3 Coal Mining Affected Areas

The site is in an area which may be affected by coal mining activity.

In order to provide more comprehensive information a coal mining report was obtained from The Coal Authority.

The full report is included in Appendix II however the key information relating to the contaminated land assessment is summarised in this section.

3.3.1 Underground Coal Mining

The property is not within a zone of likely physical influence on the surface from past or present underground workings. The property is also not in an area for which the Coal Authority is determining whether to grant or has granted licences to remove coal using underground methods.

The property is also not in an area that is likely to be affected at the surface from any planned future workings. However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

3.3.2 Mine entries

There are no known coal mine entries within, or within 20 m of, the boundary of the site.

3.3.3 Coal Mining Geology

At the surface, there are no known faults or other lines of weakness due to coal mining that have made the site unstable.

3.3.4 Opencast Coal Mining

The site does not lie within the boundary of an opencast site from which coal is has been, is being or will be removed by opencast methods.

3.3.5 Coal Mining Subsidence

The Coal Authority has not received a damage notice or claim for the site since January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the site.

The Coal Authority has not received a request to carry out preventive work before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

3.3.6 Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the site.

3.3.7 Hazards relating to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedure.

3.4 Radon Affected Areas and Radon Protection Measures

The site is located within a radon affected area as between 1% and 3% of homes are above the action level, however no radon protection measures are necessary in the construction of new properties.

3.5 Ground Stability Hazards

There is very low potential for landslide, running sand and shrinking or swelling clay ground stability hazards on site.

Source: British Geological Survey, National Geoscience Information Service.

3.6 Borehole records

According to the Envirocheck™ report, there are six (No. 6) boreholes located within 1 km of the site under investigation. The closest borehole to the site is located 394 m to the south west. The borehole is named as Biddulph Moor Leek Lane 01.

The closest recorded water well to the site under investigation is recorded on the BGS website as being located approximately 876 m west of the site. The water well named Nettlebeds is recorded as having been drilled to a depth of 10 m. There are no water level records presented on the BG S website for this area.

3.7 Discharge Consents

There are a total of four (No. 4) discharge consents recorded within 1 km of the site. The closest consent is located 521 m south of the site and is a trade discharge for the process effluent of a water utility company United Utilities Water Plc, however this consent recorded as evoked in 1993.

The second is located 666 m south of the site and is registered to Mr Kirkham for the discharge from a farm property via a land / soak away to the underground strata.

The third is located 864 m south of the site and is registered to JE Nixon for the discharge of sewage from a farm property via groundwater to the underground strata. Receiving water not given. Current status not supplied.

The fourth is located 973 m south of the site and is registered to G A Clews for the discharge from a farm property via a land / soak away to the underground strata.

3.8 Local Authority Pollution Prevention and Controls

There are no recorded local authority pollution prevention and controls located within 1 km of the site.

3.9 Pollution Incidents to Controlled Waters

There are a total of six (No. 6) pollution incidents to controlled waters located within 1 km of the site. The closest incident to the site is 244 m north of the site. There is no recorded information regarding the nature of the pollutant. This was listed as a minor incident.

There are a further four (No. 4) incidents (minor) which have resulted in a variety of contaminants entering tributaries of the River Dane and Biddulph Brook these include; diesel 384 m to the west of the site, an unknown pollutant 588 m to the north east of the site, crude sewage 652 m to the south west of the site and septic tank effluent 753 m to the east of the site.

One (No 1) further incident (significant) has been recorded 864 m to the south as a release of organic wastes as a result of poor practice at Bradda Farm.

3.10 Substantiated Pollution Incident Register

There are no recorded substantiated pollution incidents located within 1 km of the site.

3.11 Water Abstractions

There is one (No 1) water abstraction located within a 1 km radius of the site. The abstraction is located 865 m to the south and is registered to Mr J E Nixon at Braddow Farm.

A further eight (No. 8) water abstractions are located within 2 km of the site. There are three (No 3) abstractions located 1003 m to the north operated by Biddulph Sands Ltd for industrial and commercial purposes. A further three (No 3) are registered to Staffordshire Moorlands District Council form the lake and pond through flow and are located 1156 m and 1189 m to the north west of the site. The remaining two (No 2) abstractions are operated by P C Brown Ltd located 1887 m to the south west and Severn Trent Water located 1949 m to the north west respectively.

3.12 Local Authority Recorded Landfill Sites

There is one (No. 1) local authority recorded landfill sites listed on the Envirocheck™ report as being within 1 km of the site. The site is located 443 m to the south west of the site north of boundary cottage, Biddulph Moor. There is no listing for the waste stream accepted at this site. The license status is also unknown however the Environment Agency website has this listed as a historical landfill site, it may therefore no longer be operational.

3.13 Historical Landfill Sites

The Envirocheck™ report lists one (No. 1) historical landfill sites within 1 km of the site, located 284 m to the south west of the site at New Street, Biddulph Moor.

3.14 Contemporary Trade Directory Entries

There are nine (No 9) contemporary trade directory entries recorded in the Envirocheck™ report within 1 km from the site.

Two (No. 2) are within 250 m of the site, this includes the existing business Rudyard Road Garage and Brennans Cleaning Solutions a domestic cleaning service located 214 m to the south of the site.

Out of the remaining seven (No 7) entries five (No 5) are active and two (No 2) are inactive located between 400 m and 1000 m from the site. Active services include, cleaners, pump servicing and repairs, manufacturers, glass fibre manufacturers and road haulage.

3.15 Fuel Station Entries

Although fuel was historically dispensed at the site itself, no other fuel station entries are located within 1 km of the site.

3.16 Areas of Adopted Green Belt

There is one (No 1) area of adopted green belt within 1 km radius of the site, located 138 m to the north west of the site.

3.17 Nitrate Vulnerable Zones

The site is located in a nitrate vulnerable zone.

3.18 Historical Data Report

3.18.1 Potentially Contaminative Industrial Uses (Past Land Use)

Envirocheck reports that there are five (No. 5) past potentially contaminative land uses located within 1 km from the site. One (No. 1) is located 67 m to the south west of the site and is recorded to have been general quarrying. The date of mapping is 1891.

A further four (No. 4) are listed between 400 m and 1000 m of the site, the closest being 409 m to the north west of the site and is also recorded as general quarrying. Other past potentially contaminative land uses within 1000 m of the site include factory works use not specified located 649 m to the south west. The remaining land uses relate to general quarrying.

3.18.2 Potentially Infilled Land (Non-Water)

There are three (No. 3) areas of potentially infilled land (non-water) located within 1 km of the site located on 1990 mapping.

The closest to the site is located 67 m to the south west and is unknown filled ground, potentially a pit or quarry associated with the historical quarrying activities within the area.

3.18.3 Potentially Infilled Land (Water)

There are no areas of potentially infilled land (water) located within 1 km of the site.

3.18.4 Electrical Substation Facilities

There are no electrical substation facilities recorded within a 1 km of the site under investigation.

3.18.5 Historical Tanks and Energy Facilities

There is one (No.1) tank reported by Envirocheck™ as being located on site. The use of the tanks is not given but could potentially be associated with the current site use as a garage. The date of mapping is 1970.

4 Conceptual Model

The conceptual model for the site must follow the source-pathway-receptor pollution linkage and for a risk to exist the linkage must be complete. A source of contamination may be contaminated soils or groundwater. A Pathway is the mechanism by which a pollutant is transferred to an entity, which may be damaged by that contaminant (a receptor). Receptors may, amongst others, include environmental receptors, such as groundwater, future users of the site and structures.

Should a source-pathway-receptor link (pollutant linkage) be found then an intrusive investigation is required to investigate the possible linkage. The next stage of the process is to quantify the risk to determine site specific targets for any contaminants that may have been found dependant on the proposed future use of the site.

4.1 Possible Sources of Contamination

There are potential sources of contamination in close proximity to the site under investigation particularly considering the current land use and past land use in close proximity to the site.

Specific potentially contaminative activities include:

- Rudyard Road Garage on site (current use).
- Tank located on site (past/current use);

Potential contaminants associated with these activities include: total petroleum hydrocarbons (TPH), BTEX compounds (benzene, toluene, ethylbenzene, xylenes), metals, metalloids and semi metals.

4.2 Environmental Pathways

In order for a receptor to be impacted by a source of contamination, the receptor and source must be linked by a migration pathway.

The following potential environmental pathways have been identified for this site:

- Leaching of contaminants from soil to groundwater;
- Leaching of contaminants to surface waters
- Surface water run off

The most significant potential environmental pathway is leaching of contaminants to groundwater. The site however is classified as being located over a minor aquifer with superficial soils which are classified as having a low to leaching potential.

The site is located within a CAMS area.

There is one (No 1) recorded surface water features within 250 m of the site.

4.3 Human Health Pathways

The current land use of the site as a garage could potentially have resulted in surficial soils having become contaminated.

If surficial contamination were found to be present in the soils beneath the site this is unlikely to present a risk to future users of the site through dermal contact (from

exposed soils) or direct/indirect ingestion exposure pathways as the entire site is to be covered in either hard standing and/or tarmac.

Exposure pathways could be created during the development of the site when ground works are undertaken if potentially contaminated soils were present within the ground at the site, however if the re-development of the site does not involve groundwork then these pathways are unlikely to exist.

4.4 Receptors

Potential receptors under the proposed co ntinued usage of the site as a garage are:

- Ground workers during re-development
- Future Users
- Groundwater
- Surface water
- Buried Services (Water pipes)

The Coal Authority

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Date of your enquiry:	**06 May 2009**
Date we received your enquiry:	**06 May 2009**
Date of issue:	**07 May 2009**

This report is for the property described in the address below and the attached plan.

Coal and Brine Report

Site At Rudyard Service Station, Rudyard Road, Biddulph Moor, Stoke On Trent, Staffordshire

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Coal mining	Yes
Brine extraction	No

Information from the Coal Authority

Underground Coal Mining

Past

According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

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The property is not in an area that is likely to be affected at the surface from any planned future workings.

However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

Coal-mining geology

At the surface, there are no known faults or other lines of weakness due to coal mining that have made the property unstable.

Opencast Coal Mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority has not received a request to carry out preventive work before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of Support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

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Working Facilities Orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

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Geology Maps
A Landmark service

Envirocheck® Report: Geology 1:50,000 Maps

Order Details:

Order Number:
27701179_1_1

Customer Reference:
EES 09.085

National Grid Reference:
390760, 358260

Slice:
A

Site Area (Ha):
0.01

Search Buffer (m):
1000

Site Details:

Rudyard Service Station, Rudyard Road
Biddulph Moor
STOKE-ON-TRENT
ST8 7JD

Client Details:

MS N Greger
Ecologia Enviromental Solutions Ltd
Building 711
Bir Road
Sittingbourne Research Centre
Sittingbourne
Kent
ME9 8BL

LANDMARK
Information Group

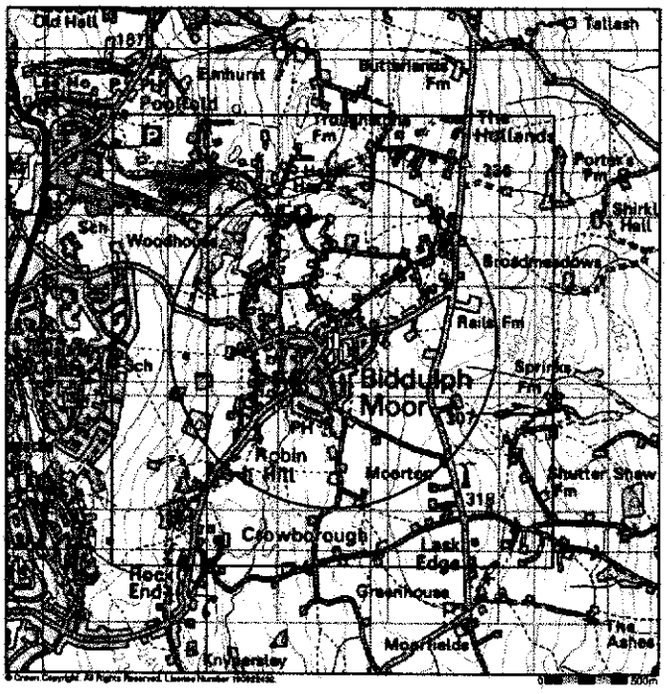
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Geological Coverage Map

This report is designed for users carrying out preliminary site assessments who require geological maps for the area around a site. The report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial (man-made) and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps. The final map, that of 'Combined Surface Geology', superimposes all these distinct layers into one, producing a map that shows the rocks that occur at the surface just beneath the soil. NOTE: The legend is in chronological order in accordance with the BGS geological age index.

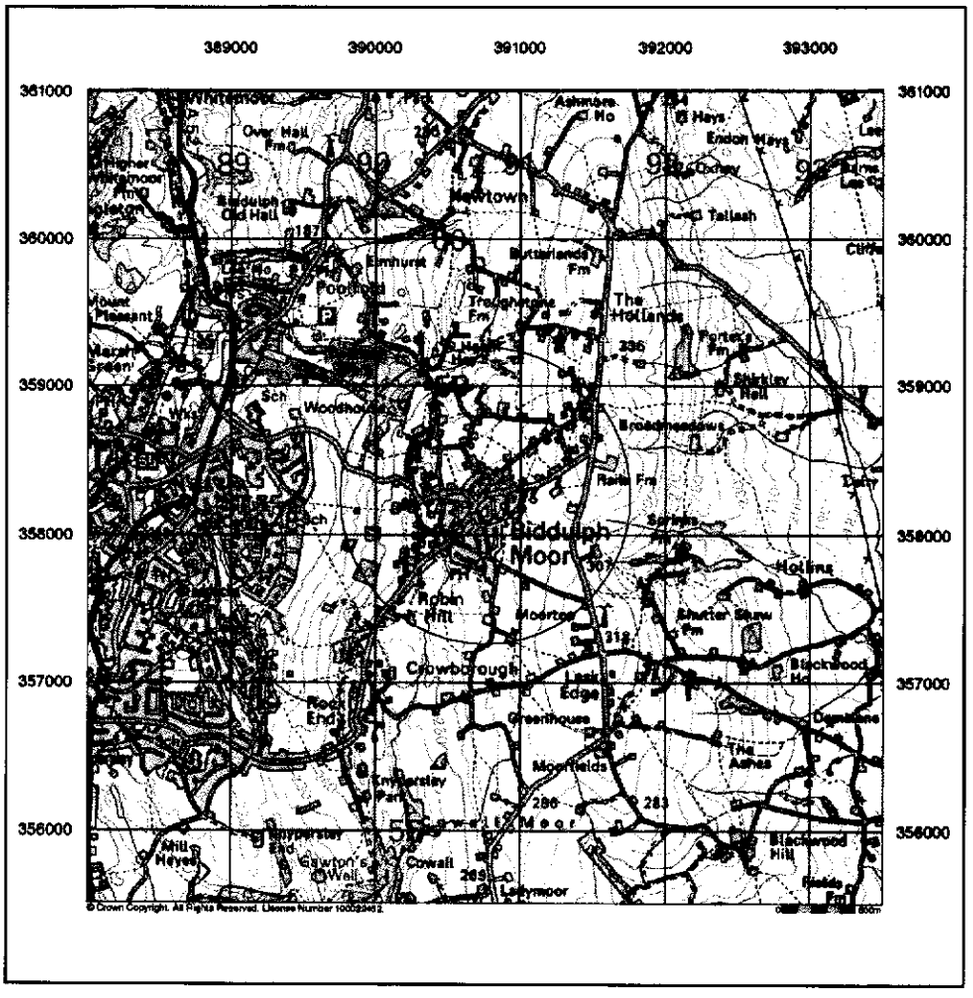
Not all of the layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.



Legend	
8	Map ID
	Specified Site
	Specified Buffer
	Slice
	Segment within a Slice

BGS 1:50,000 Geological Mapping Coverage	
Map ID:	1
Map Sheet No:	110
Map Name:	Macclesfield
Map Date:	1990
Bedrock Geology:	Available
Superficial Geology:	Available
Artificial Geology:	Not Available
Faults:	Available
Landslip:	Available
Rock Segments:	Available

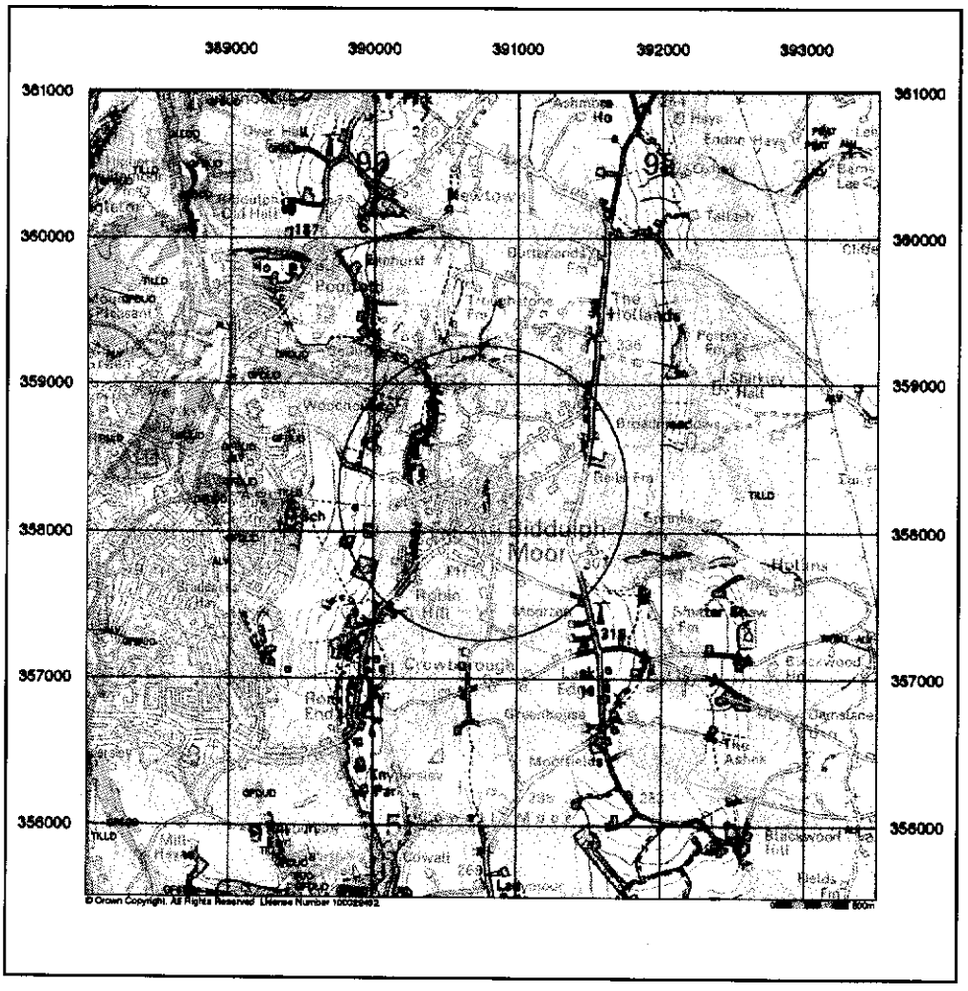
Artificial Ground and Landslip Map



Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age

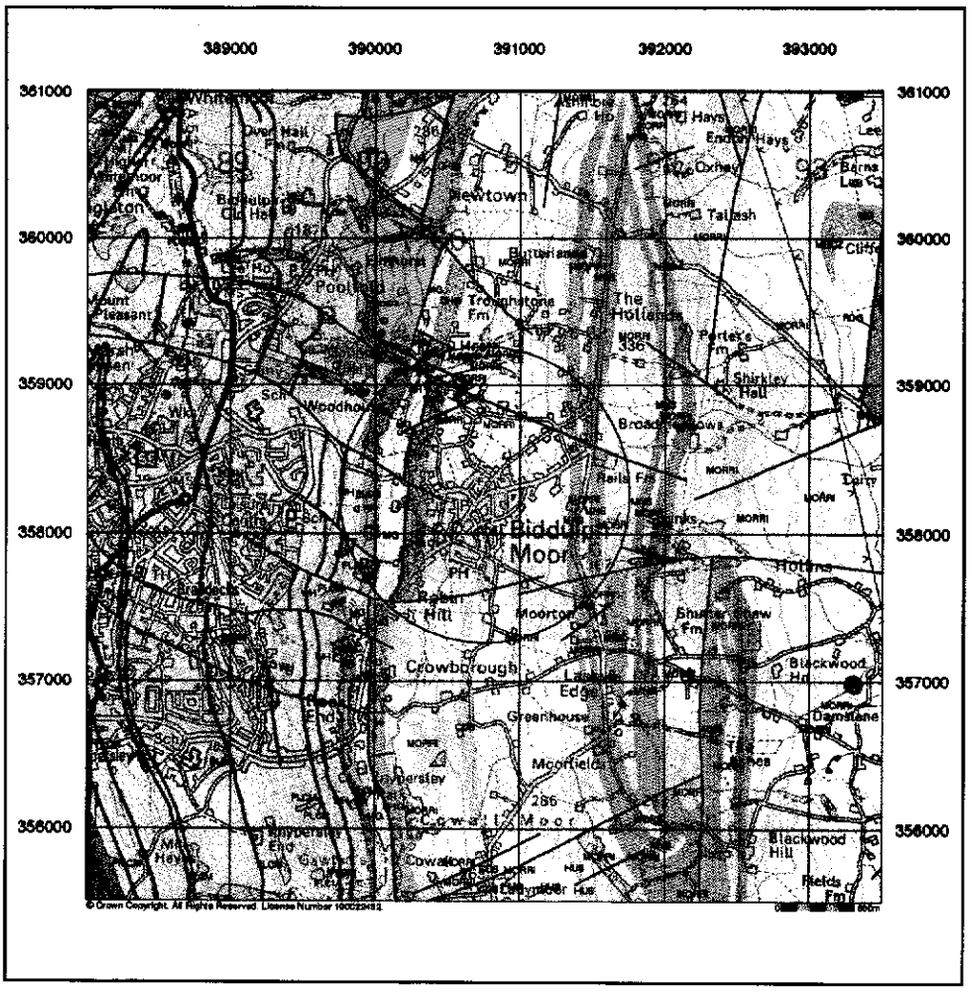
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Superficial Geology Map



Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Flandrian - Flandrian
	TILLD	Till, Devensian	Diamicton	Devensian - Devensian
	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	Devensian - Devensian
	GFSDD	Glaciofluvial Sheet Deposits, Devensian	Sand and Gravel	Devensian - Devensian
	GLLDD	Glaciolacustrine Deposits, Devensian	Clay and Silt	Devensian - Devensian
	PEAT	Peat	Peat	Quaternary - Quaternary
	RTDU	River Terrace Deposits (Undifferentiated)	Sand and Gravel	Quaternary - Quaternary

Bedrock and Faults Map



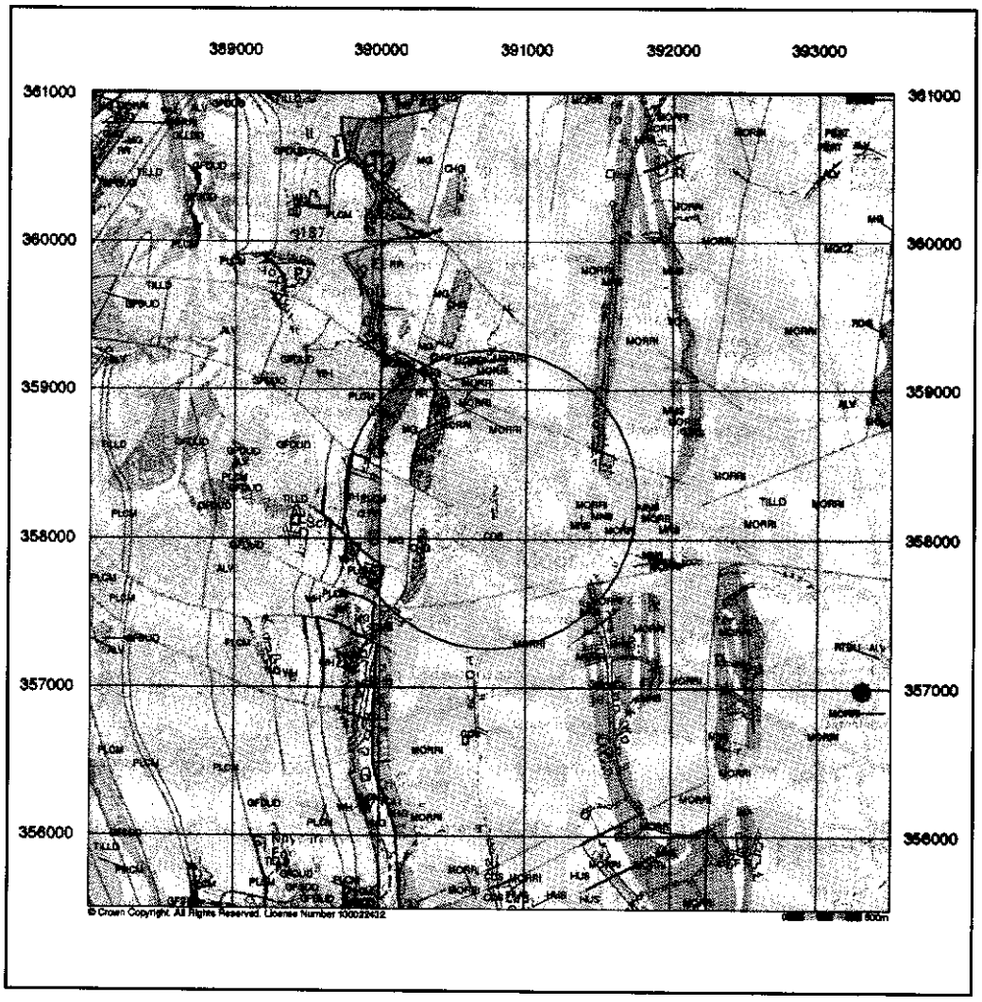
Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CPB	Chester Pebble Beds Formation	Pebbly Sandstone	Scythian - Scythian
	PMCM	Pennine Middle Coal Measures Formation	Mudstone, Siltstone and Sandstone	Bolsovian (Westphalian C) - Duckmantian (Westphalian B)
	PLCM	Pennine Lower Coal Measures Formation	Sandstone	Langsettian (Westphalian A) - Langsettian (Westphalian A)
	WH	Woodhead Hill Rock	Sandstone	Langsettian (Westphalian A) - Langsettian (Westphalian A)
	PLCM	Pennine Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Langsettian (Westphalian A) - Langsettian (Westphalian A)
	RR	Rough Rock	Sandstone	Yeadonian - Yeadonian
	CHG	Chatsworth Grit	Sandstone	Marsdenian - Marsdenian

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Bedrock and Faults Map

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ROG	Roaches Grit	Sandstone	Marsdenian - Marsdenian
	MGCZ	Unnamed Sandstone of Marsdenian Age (In Millstone Grit Group)	Sandstone	Marsdenian - Marsdenian
	CDS	Cheddleton Sandstones	Sandstone	Kinderscoutian - Alportian
	HUS	Hurdlow Sandstones	Sandstone	Arnsbergian - Arnsbergian
	MORRI	Morridge Formation	Sandstone	Marsdenian - Pendleian
	MORRI	Morridge Formation	Mudstone, Siltstone and Sandstone	Marsdenian - Pendleian
	MNS	Minn Sandstones	Sandstone	Arnsbergian - Pendleian
	MG	Millstone Grit Group [See also Migr]	Mudstone, Siltstone and Sandstone	Namurian - Namurian
		Faults		
		Rock Segments		

Combined "Surface Geology" Map



Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

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Nottinghamshire
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
Email: enquiries@bgs.ac.uk
Website: www.bgs.ac.uk

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Order Details
Order Number: 27701179
Customer Ref: EES 09.085
National Grid Reference: 390760, 358260
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000
Site Details
Rudyard Service Station, Rudyard Road, Biddulph Moor, STOKE-ON-TRENT, ST8 7JD
A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

BGS Boreholes

Map ID:	Easting:	Northing:	Distance:	Quadrant F	Quadrant F	Bearing Re	BGS Refer	Drilled Len	Borehole Name:
28	390520	357950	394	A13	SW	SW	Sj95nw19	Not Supplie	Biddulph Moor Leek Lane 01
29	390410	357890	511	A7	NE	SW	Sj95nw20	Not Supplie	Biddulph Moor Leek Lane 02
29	390380	357850	561	A7	NE	SW	Sj95nw21	Not Supplie	Biddulph Moor Leek Lane 03
30	390420	357830	550	A7	NE	SW	Sj95nw22	Not Supplie	Biddulph Moor Leek Lane 04
31	389890	358150	876	A12	SW	W	Sj85ne177	10	Nettlebeds Well
32	391710	358000	986	A14	SE	E	Sj95nw17	Not Supplie	Three Nooks Farm Site Leek Staffordshire 1

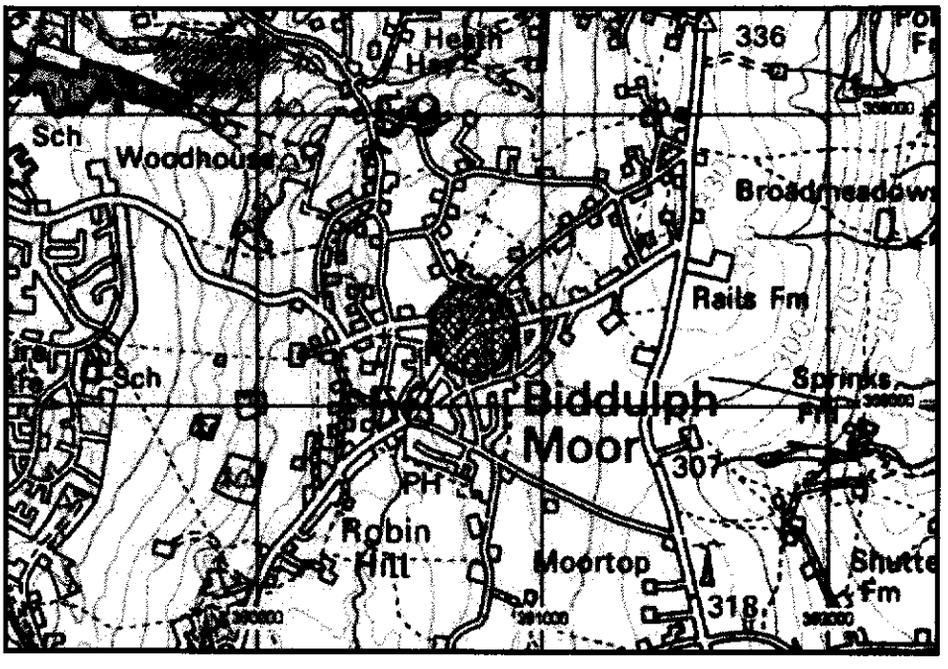
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32	391710	358000	986	A14	SE	E	Sj95nw17	Not Supplie	Three Nooks Farm Site Leek Staffordshire 1

Location map

Approximate position of property



Enquiry boundary

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Key

Approximate position of enquiry boundary shown

Ordnance Survey