



User Guide

For the Environmental Professional

Comprehensive environmental
information for site assessments

Envirocheck Mining & Ground Stability User Guide

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1. Introduction

- 1.1 Welcome to Envirocheck, a site-specific service providing accurate and timely environmental information with high quality comprehensive mapping.
- 1.2 The Envirocheck Mining & Ground Stability report is one of a number of modules that can be added to enhance the standard Envirocheck report. Alternatively, if Mining & Ground Stability information is all that you require, this module can be purchased as a stand alone report.
- 1.3 Envirocheck is designed as a set of working documents for consultants. Landmark provides no interpretation or analysis of either the textual data or the mapping. Landmark serves hundreds of companies from a variety of sectors, including the top environmental and geo-technical consultancy firms, and constantly refines the product in response to our customers' requests and suggestions. Envirocheck is what you have asked for.
- 1.4 The Envirocheck Mining & Ground Stability report is available for any and every property in mainland Great Britain.
- 1.5 Envirocheck is designed to be competitive with alternative sources of information in three different dimensions; quality of information and presentation, speed of delivery and cost - all the factors that win business for our customers. Envirocheck is particularly effective where multiple sites are involved and deadlines are tight.
- 1.6 Landmark's Legend™ database has been built by linking historical maps and textual data to a large-scale digital map of Great Britain. We crosscheck information against several different sources, which can mean that it is more accurate than the data contained in the original registers. Site-specific environmental information of this quality was not previously available without weeks of painstaking work, involving desk research and specialised cartography. Many of our customers have told us that Landmark expedites the whole process of environmental investigations because they get the results of desk research before setting out on site visits and discussions with those who have personal knowledge of the site. Previously, the desk research often ran concurrently with the rest of the work.
- 1.7 Envirocheck is able to handle larger sites by cutting the report into sections, referred to as "slices". This slicing process is explained in detail in section 2.3 of this guide.

2. The Envirocheck Mining & Ground Stability Report

- 2.1 Each Envirocheck Mining & Ground Stability report consists of a Data Sheet and feature mapping at three different scales.

2.2 Data Sheet

A Data Sheet is produced for each report slice and is divided into the following sections:

Contents, Summary Table, Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000), Ground Stability Data (1:50,000), Motion Map Data (1:2,500), Historical Map List, Data Currency, Data Suppliers and Useful Contacts.

For larger site areas each slice is covered by a separate Data Sheet.

2.2.1 Contents

The Contents page lists the report sections and gives a brief overview of the data that each section contains. Page numbers are included to aid navigation through the Data Sheet. In PDF versions of the data sheet these are included as a hyperlink and clicking on the page number will take you directly to the appropriate section. This page also includes Copyright Notices.

2.2.2 Summary Table

The Summary Table lists the information, within each search buffer, found in the Legend™ Database. The standard search buffers are on site, 0 - 250 metres, 251 - 500 metres and 501 - 1000 metres around the Site reference point or boundary. Customers can select search buffers of 50 metres, 250 metres, 500 metres and 1000 metres for the 1:10,000 scale mapping and on site, 50 metres, 100 metres and 250 metres for the 1:2,500 scale mapping. The table is modified to reflect the 1:10,000 scale search buffer selected.

A number in the table indicates that an entry for the data type has been found in the Legend™ Database. The total number of entries for each data set within a search buffer is indicated by the value. A page number is included to aid easy reference and in PDF versions of the Data Sheet this is included as a hyperlink. Clicking on the page number or the summary number entry will take you directly to the appropriate section. Figure 1 below shows an example of a Summary table.

Fig. 1: Summary Table (extract)

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1			3	4
Coal Mining Affected Areas	pg 2	Yes	n/a	n/a	n/a
Mining Instability	pg 2	Yes	n/a	n/a	n/a
Natural and Mining Cavities					
Potential Mining Areas					
Shallow Mining Hazards	pg 2	Yes	Yes	n/a	n/a
Historical Land Use Information (1:2,500)					
Extractive Industries Activity from 1855 - 1909 (100m)	pg 3	1	4	n/a	n/a
Extractive Industries Activity from 1893 - 1915 (100m)	pg 3	1	1	n/a	n/a

For some data types only the presence of a feature is indicated by a "Yes" under the appropriate search buffer in the Summary Table. This applies to the following data sets:

Mining and Natural Cavities Data:

Coal Mining Affected Areas, Mining Instability and Shallow Mining Hazards.

Ground Stability Data (1:50,000):

Brine Compensation Area, Potential for Collapsible Ground Stability Hazards, Potential for Compressible Ground Stability Hazards, Potential for Ground Dissolution Stability Hazards, Potential for Landslide Ground Stability Hazards, Potential for Running Sand Ground Stability Hazards and Potential for Shrinking or Swelling Clay Ground Stability Hazards.

2.2.2 Summary Table cont.

If a buffer of 250 metres or more is selected for the 1:10,000 scale mapping and 100 metres or less as the buffer for the 1:2,500 scale, the 1:2,500 buffer is displayed in brackets under the Data Type column. Any feature count shown in the 0-250m column of the summary table will relate only to this reduced buffer as illustrated in Fig. 1.

2.2.3 Mining and Natural Cavities Data

This section of the report covers data sets related to the existence of mining areas and their potential hazards as follows:

BGS Recorded Mineral Sites, Coal Mining Affected Areas, Man Made Mining Cavities, Mining Instability, Natural Cavities, Potential Mining Areas and Shallow Mining Hazards.

Detailed information on these data sets can be found in Appendix 1.

Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.

Figure 2 below shows an extract of the data listed under the Mining and Natural Cavities Data as it would appear in a Envirocheck Mining & Ground Stability report. Items listed which have a Map ID are plotted on the appropriate map.

Each reported record will have a quadrant reference, compass direction and an estimated distance from the site in metres, making it easier to locate points on the maps. A full explanation of quadrant references is given in section 2.3 of this guide. A column detailing the contact for the recorded information is included together with the National Grid Reference for each record. For a record that falls within the boundary of the site the estimated distance from site is reported as '0'.

Fig 2.: Mining and Natural Cavities Data (extract)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	BGS Recorded Mineral Sites Site Name: Cobridge Location: Cobridge, Stoke-On-Trent, Staffordshire Source: British Geological Survey, National Geoscience Information Service Reference: 15968 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Upper Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	678	1	387810 348985
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	(NE)	0	2	392001 352987
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	(E)	0	3	392500 348500

2.2.4 Historical Land Use Information (1:2,500)

This section of the report covers data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of the Envirocheck Mining & Ground Stability report, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map.

This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.

Detailed information on these data sets can be found in Appendix 1.

Figure 3 below shows an extract of the data listed under the Historical Land Use Information (1:2,500) as it would appear in an Envirocheck Mining & Ground Stability report.

Each entry has a Map ID, Details Section, Quadrant Reference, Compass Direction, Estimated Distance From Site, Contact and National Grid Reference as described under the Mining and Natural Cavities Data section.

Fig. 3: Historical Land Use Information (1:2,500) (extract)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	Extractive Industries Activity from 1855 - 1909 Use: Extraction - Colliery - Coal First Map Published 1877 Date: Last Map Published 1880 Date: Status: N	A13NE (NE)	0	-	388377 348568
7	Extractive Industries Activity from 1855 - 1909 Use: Railway - Railway Embankment - N/A First Map Published 1877 Date: Last Map Published Not Applicable Date: Status: N	A13NE (N)	32	-	388294 348540

2.2.5 Historical Land Use Information (1:10,000)

This section of the report covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses.

For the purpose of this Envirocheck Mining and Ground Stability report, only data categories relating to mining and ground stability has been included in the report as follows:

Air Shafts, Disturbed Ground, General Quarrying, Heap (unknown constituents), Mineral Railway, Mining & quarrying general, Mining of coal & lignite, Quarrying of sand & clay and operation of sand & gravel pits, Former Marshes, Potentially Infilled Land (Non-Water) and Potentially Infilled Land (Water).

Detailed information on these data sets can be found in Appendix 1.

Features revealed are plotted on the accompanying Historical Land Use Information (1:10,000) map.

Figure 4 below shows an extract of the data listed under the Historical Land Use Information (1:10,000) as it would appear in an Envirocheck Mining & Ground Stability report.

Each entry has a Map ID, Details Section, Quadrant Reference, Compass Direction, Estimated Distance From Site, Contact and National Grid Reference as described under the Mining and Natural Cavities Data section.

Fig. 4: Historical Land Use Information (1:10,000) (extract)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
23	Air Shafts Use: Not Supplied Date of Mapping: 1891	A14NW (NE)	525	-	388752 348761
24	General Quarrying Use: Not Supplied Date of Mapping: 1891	A7NE (SW)	704	-	387824 347983
25	Heap, unknown constituents Use: Not Supplied Date of Mapping: 1995	A13NW (NW)	205	-	388175 348676

2.2.6 Ground Stability Data (1:50,000)

This section of the report covers data sets as follows:

Brine Compensation Area, Brine Pumping Related Features, Brine Subsidence Solution Area, Potential for Collapsible Ground Stability Hazards, Potential for Compressible Ground Stability Hazards, Potential for Ground Dissolution Stability Hazards, Potential for Landslide Ground Stability Hazards, Potential for Running Sand Ground Stability Hazards, Potential for Shrinking or Swelling Clay Ground Stability Hazards and Salt Mining Related Features, Subsidence Insurance Claims, Subsidence Investigations.

Detailed information on these data sets can be found in Appendix 1.

Features revealed for the 6 BGS Geosure ground stability hazards data sets, each reporting potential hazards up to 250m, are plotted onto the 3 separate A4 1:50,000 scale maps. Brine Pumping Related Features and Salt Mining Related Features are also plotted on the first of these maps. The Brine Compensation Area, Brine Subsidence, Subsidence Insurance Claims and Subsidence Investigations data sets are not plotted.

Figure 5 below shows an extract of the data listed under the Ground Stability Data (1:50,000) as it would appear in an Envirocheck Mining & Ground Stability report.

Each entry has a Map ID, Details Section, Quadrant Reference, Compass Direction, Estimated Distance From Site, Contact and National Grid Reference as described under the Mining and Natural Cavities Data section.

Fig. 5: Ground Stability Data (1:50,000) (extract)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Brine Compensation Area The site does not fall within the brine compensation area.				
	Potential for Collapsible Ground Stability Hazards No Hazard				
94	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	0	1	388100 348475
95	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	195	1	388100 348475

2.2.7 Motion Map Data (1:2,500)

This section of the report contains the Motion Map data set; data that is derived from NPA's Ground and Structure Motion database, which offers a unique insight into long-term stability trends across the UK. Through the analysis of satellite radar data, historical motion trends have been derived across a dense network of measurement points. These measurement points correspond to buildings, bridges, rocky outcrops and other features which strongly reflect the satellite radar.

Detailed information on this data set can be found in Appendix 1.

Features revealed are plotted on the accompanying Motion Map (1:2,500) map.

Each entry has a Map ID, Details Section, Quadrant Reference, Compass Direction, Estimated Distance From Site, Contact and National Grid Reference as described under the Mining and Natural Cavities Data section.

2.2.8 Historical Map List

The Historical Map List section gives details of the historical mapping that has been analysed for your site, in relation to the data in the Historical Land Use Information sections.

Figure 6 below shows an extract of the data listed under the Historical Map List as it would appear in an Envirocheck Mining & Ground Stability report.

Fig. 6: Historical Map List (extract)

1:10,560	Mapsheet	Published Date
Staffordshire	012_SW	1890
Staffordshire	012_SW	1900
Staffordshire	012_SW	1926
Staffordshire	012_SW	1951

2.2.9 Data Currency

This section is designed to provide additional information on the update cycles, the version of the data used in the report and the source of each data set.

Figure 7 below shows an extract of the data listed under Data Currency as it would appear in an Envirocheck Mining & Ground Stability report. For each data set, the source is named, with the date of the latest version available, together with the update cycles agreed with the data suppliers.

Fig. 7: Data Currency (extract)

Mining Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2007	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Mining Report Service	January 2006	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable

2.2.10 Data Suppliers

This section provides a list of some of the key organisations who provide data that is used within the Envirocheck Mining & Ground Stability report.

2.2.11 Useful Contacts

This section provides contact addresses and telephone numbers to assist customers who may wish to make additional enquiries regarding the Envirocheck Mining & Ground Stability report.

2.3 Mapping

In order to accommodate larger site areas, Envirocheck reports use "Slices" to divide a site into sections. Each slice covers an area on the ground of 2.7 by 2.7 kilometres which is reproduced on an A3 print at 1:10,000 scale. Most sites will only require one slice but larger areas will be divided into a maximum of 16 slices, which will allow full coverage of a site where the site and total buffer has a maximum dimension in any direction of 10.8km. (i.e. maximum site dimension plus twice the selected search buffer).

Orders for linear sites, such as roads and railways, and sites larger than 10.8km including the search buffer cannot be processed immediately on line but will need to be saved as a quote. Customer Services can then split this quote into a number of separate orders which can then be run.

To allow easy location of features each slice has a bearing reference point from which the compass directions shown in the Data Sheet are derived. This bearing reference point is plotted on the 1:10,000 scale mapping however, if the slice has several segments as described below, the bearing reference point will obviously only be shown on the single 1:2,500 segment in which it is located.

Features that are located in close proximity are coalesced for easier map interpretation. These features are identified as those that have a red box around them; this meaning that there are multiple features of the same data set in the vicinity of that location. All the features that are coalesced into this single feature are reported in the datasheet.

The compass directions are best suited for use with sites that cover a single slice. Feature locations are probably more easily identified on larger sites with multiple slices by using the quadrant reference.

2.3.1 Index map

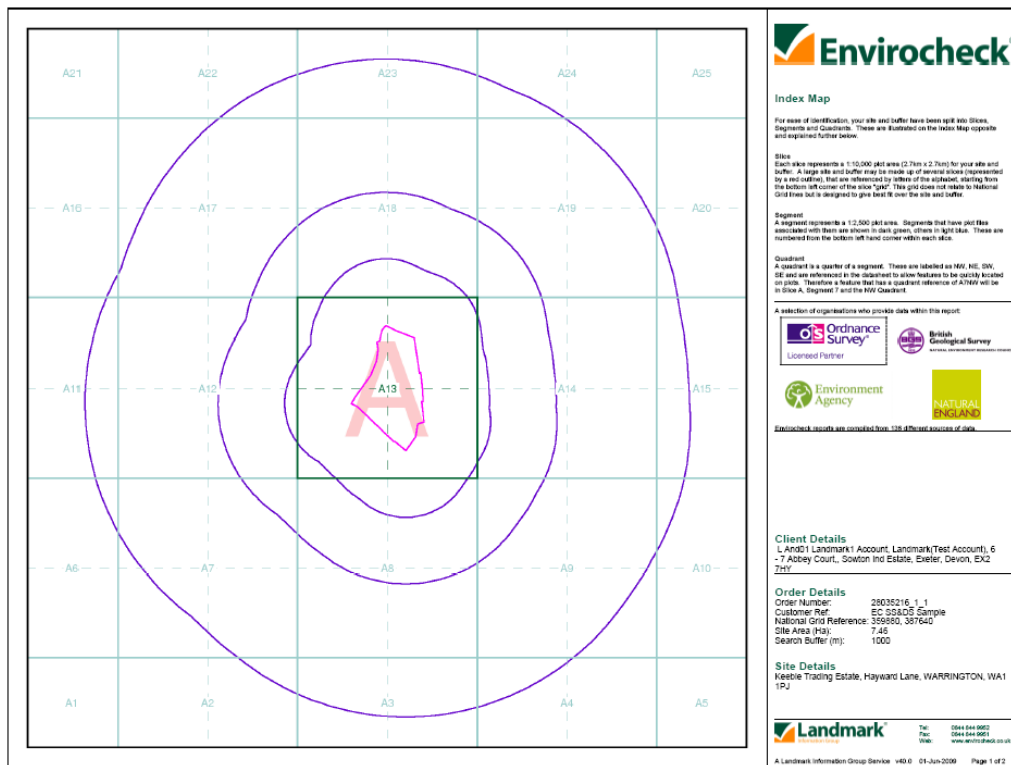
An index map is produced for every order which shows the number of slices in the order and the segments into which each slice is divided. Each segment covers a single 1:2,500 scale plot area and is divided into quadrants, NW, NE, SW and SE to allow easy reference to the location of a feature. Slices are identified by a letter and segments by the slice letter followed by a number.

A set of Landmark's Terms and Conditions is attached to the Index map.

If your Envirocheck Mining & Ground Stability report is ordered with other Envirocheck report modules, only one index map will be produced for the whole order.

Figure 8 below shows an example of an index map.

Fig. 8: Index Map



2.3.2 Historical Land Use (1:10,000) map

This map is reproduced at 1:10:000 scale and is supplied as A3, covering an area on the ground 2.7 by 2.7 kilometres.

A separate map is produced for each slice.

Features revealed in the Historical Land Use (1:10,000) section of the report are plotted on this map, together with Potential Mining Areas and BGS Recorded Mineral Sites from the Mining and Natural Cavities Data section.

This map should be interpreted with the aid of the report data sheet. All items are plotted under their Map ID numbers and can be located on the map using the distance and direction from the bearing reference point. A full explanation of the symbols is provided in the Legend to the right of the map. Similarly, where the Map ID appears on the map the associated text appears in the data sheet.

2.3.2 Historical Land Use (1:2,500) and Motion Map Data (1:2,500) maps

These maps are reproduced at 1:2:500 scale and is supplied as A3, covering an area on the ground 675 by 675 metres.

A separate map is produced for each segment.

Features revealed in the Historical Land Use (1:2,500) section of the report are plotted on the Historical Land Use (1:2,500) map, including the subterranean features.

Features revealed in the Motion Map Data (1:2,500) section of the report are plotted on the Motion Map (1:2,500) map.

As with the 1:10,000 scale, this map should be interpreted with the aid of the report data sheet. All items are plotted under their Map ID numbers and are probably best located on the map using the quadrant identified in the data sheet.

2.3.3 Ground Stability Data (1:50,000) map

Each slice of the Envirocheck Mining & Ground Stability report has three A4 Ground Stability Data (1:50,000) maps, produced in landscape orientation. The first of these maps shows Potential for Compressible Ground Stability Hazards and Potential for Collapsible Ground Stability Hazards together with Brine Pumping Related Features and Salt Mining Related Features. The second map shows Potential for Landslide Ground Stability Hazards and Potential for Ground Dissolution Stability Hazards. The final map shows Potential for Running Sand Ground Stability Hazards and Potential for Shrinking or Swelling Clay Ground Stability Hazards.

The scale of the reproduced maps is 1:25,000, taken from 1:50,000 base mapping, and covers the area of the report slice, indicated by the red square, and an additional area beyond. The map covers an area on the ground of 4.075 x 4.075 kilometres in total.

2.4 Quality Assurance

Should there be any query raised concerning your Envirocheck Mining & Ground Stability report or if you have any questions concerning either the content or the presentation of your report, please do not hesitate to contact us on 0844 844 9952 and speak to one of our Customer Services staff. Landmark's business comes from satisfied customers and we will do everything possible to meet our customers' requirements.

3. Ordering Envirocheck Reports

- 3.1** You are able to order any Envirocheck report and register on-line at www.envirocheck.co.uk. Alternatively you can apply for an Envirocheck report using an Order Form through the office. Please contact Customer Services on 0844 844 9952 to obtain an Order Form.
- 3.2** If you apply for a search by order form, it is important that each order is accompanied by a location plan, clearly showing the site boundary in relation to established surface features. Orders submitted without a location plan may lead to delays in locating the site.
- 3.3** In normal circumstances Envirocheck reports will be delivered as follows:
- Orders placed via www.envirocheck.co.uk on a normal working day before 12 noon will be dispatched on the same day.
- Orders placed via www.envirocheck.co.uk after 12 noon, or those placed at weekends and bank holidays, will be dispatched on the next working day.
- Orders placed through the office are dispatched the next working day provided a signed order form is received before 4 pm.
- Orders are dispatched by courier and use a pre 10 am delivery service. This service is subject to courier performance.
- 3.4** For questions about aspects of our Envirocheck services please contact Customer Services as detailed below:

Landmark Information Group Limited

The Smith Centre
Fairmile
Henley-on-Thames
Oxon
RG9 6AB

Telephone: **0844 844 9952**

Fax: **0844 844 9951**

E-mail: **customerservices@landmarkinfo.co.uk**

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
1:50,000 Colour Raster Mapping	1:50,000 Colour raster mapping provides national coverage of Great Britain. The mapping mirrors Ordnance Survey's Landranger® map series.	Ordnance Survey	Raster Mapping	From 2002	As notified	Ground Stability mapping
BGS Recorded Mineral Sites	This data set is geo-coded by BGS. It comprises details of all mines, quarries and mineral sites operating in England, Wales and Scotland since 1993. The original data was compiled by BGS in 1993-94, primarily from their own records and also from information supplied by Local Authorities, the Valuation Office Agency and industrial sources.	British Geological Survey (BGS)	Point & Text	From 1993	Annually	Mining and Natural Cavities
Brine Compensation Area	An area in Cheshire and Greater Manchester that was set out in the Brine Pumping (Compensation for Subsidence) Act (1891) and the Cheshire Brine Pumping (Compensation for Subsidence) Act (1952). The areas outlined in these acts were those deemed to be liable to subside as a result of the salt industry. Any damages as a consequence of these activities are eligible for compensation.	Cheshire Brine Subsidence Compensation Board	Polygon	From November 2002	Not Applicable	Ground Stability
Brine Pumping Related Features	This data set contains features relating to brine pumping, including brine 'runs', brine boreholes and wells, and other areas where dissolution has taken place due to brine pumping. A brine run is defined as the line of movement of brine - usually towards the pumping borehole in times of wide brine or natural brine extraction. This leads to the ingress of fresh water into the surface of the salt beds remote from the borehole, causing rapid solution of the surface of the salt and subsequent surface subsidence. The subsidence is usually more severe at the points of freshwater ingress, reducing as the brine content approaches saturation nearer the extraction borehole. Brine runs have existed in geological time, caused by natural solution of the salt beds but have been exacerbated by the pumping of wild brine along such runs.	Wardell Armstrong LLP	Point & Polygon	Not Applicable	As Notified	Ground Stability
Brine Subsidence Solution Area	This data indicates the boundary of areas potentially affected by subsidence due to brine solution. The brine subsidence data relating to the Droitwich area is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. Brine subsidence is a natural effect; zone boundaries can and do change over time.	Johnson, Poole and Bloomer	Polygon	Not Applicable	As notified	Ground Stability
Coal Mining Affected Areas	This data set is made up of 1km polygon areas which may be affected by coal mining activity.	Coal Authority	Polygon & Text	Not Applicable	As notified	Mining and Natural Cavities
Former Marshes	Locations of former marshes as derived from Historical Ordnance survey 1:10,560 scale mapping	Ordnance Survey	Polygon	Not Applicable	Not Applicable	Historical Land Use Information (1:10,000)
Man-Made Mining Cavities	This dataset contains information on cavities produced by mining activity in the past for the extraction of chalk, flint and other minerals. The data is supplied by Peter Brett Associates and has GB coverage.	Peter Brett Associates	Point, Polygon & Text	Not Applicable	Variable	Mining and Natural Cavities
Mining Instability	Mining Instability is a data set based on the findings of a report completed by Ove Arup and Partners in December 1991 commissioned by the former Department of the Environment (DoE). It forms part of the Geology and Minerals Planning Research Programme of the DoE, aimed at assessing the significance of environmental hazards and their influence on planning and control of development. The main objective of the data is to indicate where mining should be borne in mind when considering planning and development of land.	Ove Arup & Partners	Polygon & Text	Not Applicable	Not Applicable	Mining and Natural Cavities

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
Motion Map	<p>Motion Map is a Geographical database of Persistent Scatterers (PS), their location and associated motion characteristics, obtained by Persistent Scatterer Interferometry (PSI). The database covers the temporal period 1992 to 2002. The PSI information is derived from Nigel Press Associates (NPA's) Ground and Structure Motion database, which offers an insight into long-term stability trends across the UK. Through the analysis of satellite radar data, historical motion trends have been derived across a dense network of measurement points. These measurement points correspond to buildings, bridges, rocky outcrops and other features which strongly reflect the satellite radar.</p> <p>Each PS point has an average velocity gradient, which indicates the average change in height of that point between 1992 and 2002. The data indicates long-term stability trends and displacement readings every 2 months on average.</p> <p>PS correlate to features which respond strongly to the incoming satellite SAR signal. Typically include buildings, infrastructure and rocky outcrops. As such, the technique is best suited to urban and semi-urban areas.</p> <p>Each date's displacement value is a relative measurement from the datum (the first date value height of '0'.</p>	Nigel Press Associates	Point & Text	Not Applicable	Variable	Motion Map
Natural Cavities	<p>This dataset contains details of naturally formed cavities as produced by the processes of dissolution, cambering, marine erosion and other processes. The 'other processes' includes a variety of cavity forms such as soil piping, scour hollows, fault movement and erosion of natural discontinuities in rocks by the action of water.</p>	Peter Brett Associates	Point, Polygon & Text	Not Applicable	Variable	Mining and Natural Cavities
OS Mastermap®	Digital large-scale mapping of the whole of England Scotland and Wales.	Ordnance Survey	Digital Mapping	Current	Annually	1:2,500 Historical Land Use Information map
Potentially Contaminative Industrial Uses from Large Scale Mapping published between 1950 and 1980	<p>This data set was captured from the analysis of the first available post-war National Grid Ordnance Survey map at 1:2,500 scale and 1:1,250 scale, and identifies areas where, historically, the land uses were potentially contaminative.</p> <p>The date ranges for the source mapping are 1950's & 1960's for urban areas and 1960's & 1970's for rural areas. This data represents the period of post-war urban expansion and therefore contains a significant amount of contaminative uses.</p> <p>Coverage of the 1:2,500 scale mapping extends over the whole of mainland Britain, with the exception of upland and moorland areas which were not mapped at all. The 1:1,250 scale mapping only covers urban and built up areas.</p>	Landmark	Point, Polygon & Text	From 1950 - 1980	Not Applicable	Historical Land Use Information (1:2,500)
Potentially Contaminative Industrial Uses (Past Land Uses)	<p>From historical mapping, dating back to the middle of the 19th century, Landmark's Systematic Analysis has identified areas where, historically, the land uses were potentially contaminative.</p> <p>This is drawn from a series of up to six Historical map editions - up to four Ordnance Survey 1:10,560 County Series Maps (usually pre-W.W.II), the first National Grid Black and White raster 1:10,560 map and the last National Grid edition Black and White raster map at 1:10,000 scale.</p>	Landmark	Point, Polygon & Text	From 1850	Not Applicable	Historical Land Use Information (1:10,000)
		Ordnance Survey	Point, Polygon & Text	From 1850	Not Applicable	
Potentially Contaminative Land Uses (1855-1909) from large scale historical mapping	<p>This data set was captured from the analysis of Ordnance Survey map at 1:2,500 scale and 1:1,250 scale, and identifies areas where, historically, the land uses were potentially contaminative. The date ranges for the source mapping are 1855 to 1909.</p> <p>Coverage of the 1:2,500 scale mapping extends over the whole of mainland Britain, with the exception of upland and moorland areas which were not mapped at all. The 1:1,250 scale mapping only covers urban and built up areas.</p>	Landmark	Point, Polygon & Text	From 1855-1909	Not Applicable	Historical Land Use Information (1:2,500)

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
Potentially Contaminative Land Uses (1893-1915) from large scale historical mapping	This data set was captured from the analysis of Ordnance Survey map at 1:2,500 scale and 1:1,250 scale, and identifies areas where, historically, the land uses were potentially contaminative. The date ranges for the source mapping are 1893 to 1915. Coverage of the 1:2,500 scale mapping extends over the whole of mainland Britain, with the exception of upland and moorland areas which were not mapped at all. The 1:1,250 scale mapping only covers urban and built up areas.	Landmark	Point, Polygon & Text	From 1893-1915	Not Applicable	Historical Land Use Information (1:2,500)
Potentially Contaminative Land Uses (1906-1937) from large scale historical mapping	This data set was captured from the analysis of Ordnance Survey map at 1:2,500 scale and 1:1,250 scale, and identifies areas where, historically, the land uses were potentially contaminative. The date ranges for the source mapping are 1893 to 1915. Coverage of the 1:2,500 scale mapping extends over the whole of mainland Britain, with the exception of upland and moorland areas which were not mapped at all. The 1:1,250 scale mapping only covers urban and built up areas.	Landmark	Point, Polygon & Text	From 1906-1937	Not Applicable	Historical Land Use Information (1:2,500)
Potentially Contaminative Land Uses (1924-1949) from large scale historical mapping	This data set was captured from the analysis of Ordnance Survey map at 1:2,500 scale and 1:1,250 scale, and identifies areas where, historically, the land uses were potentially contaminative. The date ranges for the source mapping are 1893 to 1915. Coverage of the 1:2,500 scale mapping extends over the whole of mainland Britain, with the exception of upland and moorland areas which were not mapped at all. The 1:1,250 scale mapping only covers urban and built up areas.	Landmark	Point, Polygon & Text	From 1924-1949	Not Applicable	Historical Land Use Information (1:2,500)
Potential for Collapsible Ground Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for Superficial geology has been used. Collapsible ground occurs when certain types of ground, that have an open porous structure with large pore spaces, collapse when too great a load is placed on them or when they become saturated when a lesser load is applied	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability
Potential for Compressible Ground Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for Superficial geology has been used. Certain types of ground, such as that developed beneath river plains, can contain very soft layers or pockets. These can compress under the weight of overlying structures, such as buildings, resulting in progressive depression of the ground and disturbance of foundations.	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability
Potential for Ground Dissolution Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for Superficial geology has been used. Ground dissolution occurs when certain types of bedrock contain layers of material that can dissolve within the ground water. This can cause underground cavities to develop that, with time, can reach the surface and cause significant ground movement, such as the development of collapse hollows that can directly impinge on buildings.	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
Potential for Landslide Ground Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for Superficial geology has been used. The Potential for Slope instability occurs due to particular types of slope becoming unstable under certain circumstances, causing down-slope movement of the ground and disruption to buildings. A combination of factors, including, amongst others, the rock type, the presence of excess water (natural or relating to man-made activity), the angle of the slope, and construction work such as cuttings or embankments can all contribute.	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability
Potential for Running Sand Ground Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for Superficial geology has been used. Running sand occurs when loosely-packed sand flows (runs) because water flowing through the spaces between the grains reduces the contact between the grains and they are swept along in the flowing water. This may happen where springs occur at the base of sand outcrops, where excavations in sand go below the water table or around leaking drains or water pipes.	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability
Potential for Shrinking or Swelling Clay Ground Stability Hazards	This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists. Maps of this natural subsidence hazard are derived from 1:50,000 geological maps. In small areas of the country where the 1:50,000 scale data is not available, 1:250,000 mapping for bedrock geology and 1:625,000 for superficial geology has been used. Shrinking/Swelling Clay can change volume due to variation in ground moisture. This can cause ground movement, particularly in the upper 2 metres of the ground, which may affect foundations. Ground moisture variations can be related to a number of factors, including weather variations (annual or longer term), vegetation effects (particularly growth or removal of trees) and man-made activity.	British Geological Survey	Polygon & Text	Not Applicable	Annually	Ground Stability
Potentially Infilled Land	From historical mapping dating back to the middle of the 19th century, Landmark's Systematic Analysis Department has identified areas where cavities and areas of water or marsh have potentially been infilled with materials. This is drawn from a series of up to six Historical map editions - up to four Ordnance Survey 1:10,560 County Series Maps (usually pre-W.W.II), the first National Grid Black and White raster 1:10,560 map and the last National Grid edition Black and White raster map at 1:10,000 scale.	Landmark	Point, Polygon & Text	From 1850	Not Applicable	Historical Land Use Information (1:10,000)
		Ordnance Survey	Point, Polygon & Text	From 1850	Not Applicable	

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
Potential Mining Areas	<p>This data set identifies areas potentially affected by abandoned mines within Great Britain and has been captured and compiled by Landmark. The source data identifies areas affected by mining using 400m x 400m map grid squares and has been captured as 400m x 400m polygons.</p> <p>The primary source of mine details is the Mining Catalogue, which was held by the Mines Department and published in 1929. Additions to the Catalogue were made by the publication of supplement documents from 1929 to 1938 (Landmark did not have access to the supplements published in 1937 and 1938).</p> <p>After the dissolution of the Mines Department the Mining Catalogue passed to the National Coal Board. All metal related mines were then taken as a subset of the Mining Catalogue to create the Catalogue of Plans of Abandoned Mines other than Coal and Oil Shale, also known as the Metalliferous Catalogue. This forms the second source of mine details for this data set. The Metalliferous Catalogue was published in 1958 with additions logged by the Health and Safety Executive up until December 1985. The Metalliferous Catalogue probably contains metalliferous entries from the supplement documents produced in 1937 and 1938.</p> <p>A process of comparison and de-duplication between the two data from the two sources was undertaken by Landmark to create a single data set. The records within this data set contain details of the mine names, the commodities mined from them, and associated working dates.</p>	Wardell Armstrong LLP	Polygon & Text	Not Applicable	Not Applicable	Mining and Natural Cavities
Salt Mining Related Features	<p>This data set contains features related to salt mining, including areas of mining, mine shafts, brine shafts, bastard brine shafts, brine wells and exploratory boreholes. Currently the coverage of this data set is confined to the Northwich and Marston area of Cheshire.</p> <p>Shafts can be defined as vertical or inclined passageways used to access underground mineral outcrops or brine supplies. Boreholes are deep and narrow shafts in the ground used to test the location and commercial viability of underground deposits (salt/brine). Brine Wells are usually of a significantly larger diameter than boreholes (circa 2-3 metres) and used to extract brine from the surface of the salt beds by bucket or other means.</p>	Wardell Armstrong LLP	Point, Polygon & Text	Not Applicable	Not Applicable	Ground Stability
Shallow Mining Hazard	<p>This assessment is based on data produced by the British Geological Survey (BGS) using the latest geological mapping information and interpretation by BGS geologists.</p> <p>Maps of shallow mining hazard are derived from 1:50,000 and 1:250,000 geological maps plus analysis of historical mine plans, enhanced by local geological knowledge built up during detailed geological mapping.</p> <p>This assessment takes into account many types of mining in addition to coal, such as ironstone or limestone extraction.</p> <p>Shallow mining has been defined as workings within 40 metres of the ground surface, and does not include deeper mine workings. Shallow mine workings may have a greater potential for generating ground movement at the surface than deeper workings. Although mining hazard can cause the ground movement, it will not necessarily cause building movement as this depends on the type and age of the building in the area of search.</p>	British Geological Survey	Polygon & Text	From 1994	Bi-annually	Mining and Natural Cavities

Appendix 1 : Data Sets Currently Used in Envirocheck Mining & Ground Stability

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Section
Streetview	1:10,000 scale raster National Grid providing national coverage of Great Britain. This is derived from the Ordnance Survey Landplan® and OSCAR Traffic-Manager® road information..	Ordnance Survey	Raster Mapping	Current	Bi-Annually	1:10,000 Historical Land Use Information map
Subsidence Insurance Claims	<p>This data set identifies sites where SP Property Services have undertaken subsidence monitoring. The fact that subsidence monitoring is being carried out indicates that a valid subsidence insurance claim has been made at this location.</p> <p>Where enough information has been collected during the subsidence monitoring, a damage classification will be attributed to the record, based upon crack width. In addition, some records will have a movement trend indication (MTI), detailing the type of movement occurring and the movement variation relative to the damage classification scale. The MTI is produced from stud measurements, rather than crack size.</p>	SP Property Services	Point & Text	Not Applicable	Quarterly	Ground Stability
Subsidence Investigations	<p>This data set identifies sites where the CET Group have undertaken investigations to examine subsidence claims. Therefore, this data set does not necessarily confirm the site of valid subsidence claims.</p> <p>Each record will indicate whether a CCTV drain survey or root analysis has taken place during the investigation. Against some records a classification of soil character has been given, and a depth measurement of the first soil sample which is normally taken from the underside of the footings.</p> <p>The coverage of the dataset is Great Britain, although CET mainly work in England and Wales. Therefore, only a very small number of records exist in Scotland. Updates to the data will be supplied on a quarterly basis.</p>	CET Group	Point & Text	Not Applicable	Quarterly	Ground Stability
Subterranean Features	This dataset contains all types of underground space (classed into 23 main categories) as identified by the Subterranea Britannica website	Subterranea Britannica	Point, Polygon & Text	Not Applicable	Bi-Annually	Historical Land Use Information (1:2,500)