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PRELIMINARY RISK ASSESSMENT AND GROUND INVESTIGATION REPORT FOR A SITE AT PRESTON STREET, WHITEHAVEN, CUMBRIA

Prepared by DTS Raeburn Limited

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Date:	November 2016			
Prepared by:	J. O'Keeffe MSc FGS Engineering Geologist			
	J. Billam PhD CEng MICE Geotechnical Consultant			
Checked by:	S.E. Johnson BSc (Hons) FGS Associate Director			
Approved by:	A.B.C. Obinwa BEng MSc CEng MICE SiLC Director			

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Generic List of Acronyms and Abbreviations

μg/kg	micrograms per kilogram	HSE	Health and Safety Executive
μg/l	micrograms per litre	IPPC	Integrated Pollution Prevention and
ACEC	aggressive chemical environment for		
	concrete	LAPPC	Local Authority Pollution Prevention
ACM	asbestos containing material		and Control
AOD	above Ordnance datum		Local Nature Reserve
bgl	below ground level	mb	millibar
BGS	British Geological Survey	MCERTS	Monitoring Certification Scheme
BH	Borehole	mg/kg	milligrams per kilogram
BTEX	benzene, toluene, ethylbenzene and	mg/l	milligrams per litre
	xylene compounds	NIEA	Northern Ireland Environment Agency
CBR	California bearing ratio	NGR	National Grid Reference
CH ₄	Methane	O ₂	oxygen
CIRIA	Construction Industry Research and	OS	Ordnance Survey
	Information Association	PAH	polycyclic aromatic hydrocarbons
CLR	Contaminated Land Report	PCB	polychlorinated biphenyls
CO	carbon monoxide	PFS	petrol filling station
CO ₂	carbon dioxide	PID	photo ionisation detector
COMAH	control of major accident hazards	PPE	personal protective equipment
CPT	cone penetration test	PRA	preliminary risk assessment
CSM	conceptual site model	SAC	Special Area of Conservation
DEFRA	Department of Environment, Food and	SEPA	Scottish Environment Protection
	Rural Affairs		Agency
DoE	Department of Environment (now part	SGV	soil guideline value
	of DEFRA)	SOM	soil organic matter
DP	dynamic probe	SPA	Special Protection Area
DPSH	dynamic probe super heavy	SPT	standard penetration test
DQRA	detailed quantitative risk assessment	SPZ	Source Protection Zone
DS	design sulphate class	SSSI	Site of Special Scientific Interest
DWS	drinking water standard	SVOCs	semi-volatile organic compounds
EA	Environment Agency	тос	total organic carbon
EHO	Environmental Health Officer	TP	trial pit
EQS	environmental quality standard	TPH	total petroleum hydrocarbons
FRA	flood risk assessment	TPO	Tree Preservation Order
GAC	generic assessment criteria	UKAS	United Kingdom Accreditation Service
GPR	ground penetrating radar	UXO	unexploded ordnance
GPS	global positioning systems	VOCs	volatile organic compounds
GQRA	generic quantitative risk assessment	WAC	Waste Acceptance Criteria
GW-TV	groundwater threshold value	WFD	Water Framework Directive
ha	Hectare	WHO	World Health Organisation
H ₂ S	hydrogen sulphide		window sampling borehole
НРА	Health Protection Agency		

PRELIMINARY RISK ASSESSMENT AND GROUND INVESTIGATION REPORT FOR A SITE AT PRESTON STREET, WHITEHAVEN, CUMBRIA

Executive Summary

Objectives and	To carry out a PRA and ground contamination and geotechnical investigation in accordance with the
Scope of Report	risk assessment framework presented in CLR11 to provide data for the proposed development of two
	non-food retail stores and associated car parking on a vacant parcel of land. The intrusive
	investigation was designed based on an initial Conceptual Site Model (CSM) formulated in the PRA,
	and also included a mining investigation to determine the presence or absence of shallow
	underground coal workings or voids.
Site Description	The initial site reconnaissance undertaken in September 2016 indicated the site to be vacant,
	surfaced largely by relict concrete hardstanding and heavily overgrown by vegetation, including three
	mature trees. The vegetation has since been removed following completion of the DTS investigation.
	The property is surrounded by a stone wall approximately 2m high.
Geology	The site is reported to be underlain by superficial strata of <i>Quaternary</i> aged alluvial deposits. These
	are in turn underlain by Carboniferous aged Pennine Middle Coal Measure Formation, consisting of
	Interbedded mudstone, siltstone, sandstone and coal.
Hydrology	Pow Beck (a designated Primary River) is indicated to be culverted from north-west to south-east
	beneath the site. Further information supplied by the Client indicates that a public sewer is located
	beneath the eastern section of the site at an unconfirmed depth of 4.3m, but that United Utilities
Hydrogeology	Both the superficial alluvial soils and underlying Coal Measures bedrock geology are elassified as
i yu ogeology	Secondary A' aquifers. However, there are no licensed groundwater abstractions within 1km of the
	site and the site does not lie within 1km of a designated Groundwater Source Protection Zone.
Maior Ecological	St Bees Head, a designated Site of Special Scientific Interest (SSSI) is present 780m southwest and the
Receptors	Cumbrian Coast Marine Nature Reserve is present 900m west. However, the site is considered to be
•	of low sensitivity with respect to these.
Flood Risk	The site is indicated to lie within a 'Flood Zone 1', corresponding to the lowest risk classification with
	respect to fluvial or tidal flooding.
Site History	The site was occupied by a stone yard and a pottery in the mid-19th century, and was redeveloped
	into an auction mart (at which cattle and livestock were sold) at around the turn of the 20 th century.
	The auction mart remained until the early 20 th century when it was relocated to new premises
	outside Whitehaven. The site has since remained vacant to the present day.
	The surrounding area has historically included a variety of industrial activities including railway
	sidings chemical textile and engine works collieries garages hoat builders and blacksmiths
	However the majority of these industries are no longer present in the area
Mineral	A Coal Mining Consultant's Report indicates that the working of one coal seam beneath the site was
Extraction	historically undertaken at about 19m depth. Further research suggests that coal mining has been
	undertaken in the Whitehaven area since the 17 th century (long before the maintenance of coal
	mining records became compulsory). A Coal Mining Risk Assessment (CMRA) is presented separately
	in DTS Report E12694/1A, and the assessment recommended that an intrusive investigation by
	means of rotary open boreholes be undertaken at the site.
Initial CSM	The contaminant-pathway-receptor linkage could potentially be completed with respect to human
	health, the development end use and controlled waters as a result of historical land uses of the site
	and surrounding area. The linkage is unlikely to be completed with respect to major ecological
	receptors.
Scope of	Comprised three cable percussion boreholes (extended by rotary open hole drilling), seven trial pits,
Investigation	three in situ plate load tests to determine CBR values, gas and groundwater monitoring and
	laboratory testing.
Strata	I nere is 1m to 3m of very loose largely granular made ground overlying up to 2m of very soft organic
Encountered	alluvial clay. Below the made ground and alluvium there is firm, stiff and very stiff clay till ('boulder
	Lidy J extending to about 10m-depth after which there is Coal Measures sandstone, mudstone and a 2m thick intact coal soam (botwoon 24m and 20mbal). The limit of evaluation was at 25m databased
	No evidence of coal mine workings or associated voids was ancountered

Groundwater	The groundwater depths recorded during monitoring in November 2016 varied between 2.0mAOD			
	(7.75m bgl) and 7.62mAOD (2.38m bgl) and may indicate separate bodies of perched ground water.			
Ground	The levels of contamination detected in the test soils are considered to be within acceptable limits			
Contamination	for retention beneath the proposed development and to present a sufficiently low risk to controlled			
Annraisal	waters			
Off-site Disposal	The concentrations of lead in the made ground at one location are sufficiently high to place the			
of Surplus Soils	affected soil into the bazardous waste for off site disposal. Observations suggest that the			
or surplus sons	anected soli linto the hazardous waste for on-site disposal. Observations suggest that the			
	The made ground tested from the surrounding trial nits could be classified as non-heardous waste			
	The made ground tested from the suffounding that pits could be classified as non-nazardous waste,			
	but is visually similar to the localised hazardous waste made ground. Further sampling and testing			
	may therefore be necessary to enable the solis to be segregated if on-site disposal of surplus made			
	ground is required. The made ground is underiain by naturally occurring alluvial clay, which would			
	also be classified as non-nazardous waste due to its organic content.			
Soll Gas	Protection measures against methane, carbon dioxide or carbon monoxide are not considered necessary			
	for the proposed retail building. Consideration should nowever be given to the inclusion of basic radon			
For store series s	protection.			
Engineering	The superficial alluvial clay has very high plasticity and high shrinkage and swelling potential. The			
properties of	clay till has low plasticity. SPT N-values and undrained shear strength are shown plotted against			
strata	depth below ground level in Figures 6 and 7.			
	in situ tests performed in the proposed car parking area gave CBK values of 10% to 16% and modulus			
	of subgrade reaction in the range 55MPa/m to 72MPa/m.			
Foundation	Pad and strip foundations cannot be recommended because of the weakness and high			
Design	compressibility if the alluvial clay. Vibro-replacement stone columns would offer no significant			
	benefit.			
	Piled foundations are recommended, for which detailed advice should be obtained from specialist			
	piling contractors. Estimated bearing resistances for CFA piles and driven precast jointed piles are			
	given.			
	A suspended ground floor slab is recommended.			
	The high shrinkage and swelling potential of the alluvial clay should not cause damage to the			
-	recommended piled foundations and suspended floor slabs.			
Pavement of Car	The proposed formation level should be prepared by removal of unsuitable materials followed by			
Parking Area	proof rolling. Flexible paving is recommended and should be designed for a CBR-value of 5%.			
Buried Concrete	The laboratory test results indicate the likely presence of pyrite within the made ground, which could			
	potentially oxidise to sulphate following ground disturbance. Any buried concrete placed in contact			
	with the made ground should therefore conform to Design Sulphate Class DS-3 and ACEC Class AC-3.			
	However, for piled foundations constructed within the underlying natural soils, the classification			
	could be reduced to Classes DS-1 and AC-1.			
Limitations	The limitations of this report are detailed in Section 14.0.			

1.0 INTRODUCTION

DTS RAEBURN Limited were commissioned by Morbaine Limited to carry out a Preliminary Risk Assessment (PRA) and ground investigation at a site off Preston Street, Whitehaven. It is understood that the site is to be redeveloped into two adjoining non-food retail stores with associated car parking and service areas.

1.1 Preliminary Risk Assessment

The principal objective of the PRA was to assess whether the site is potentially contaminated or whether there are other potential geo-environmental liabilities. These could include, but are not limited to, subsidence hazards due to shallow mining, the generation or migration of soil gas to beneath the site and other geotechnical abnormalities.

The environmental aspects of the PRA have been prepared utilising a risk-based approach and incorporating the accepted 'pollutant linkage' approach to contaminated land hazard identification (i.e. contaminant–pathway–receptor linkage). This approach is consistent with methodologies contained in both CLR11 'Model Procedures for the Management of Land Contamination' (DEFRA and EA, 2004) and Part IIA of the Environmental Protection Act 1990. The latter was introduced by Section 57 of the Environment Act 1995, which came into force in England and Wales in April 2000.

The scope of the PRA included a desk study and site reconnaissance, which comprise the minimum information required for sites where contamination is either known or suspected. The PRA has also been designed to fulfil the objectives of a 'preliminary investigation' as defined by British Standard BS10175:2011 'Investigation of Potentially Contaminated Sites – Code of Practice'.

The following information has been used to formulate the PRA:

- Site walkover survey carried out on 23rd September 2016
- Historical OS maps supplied by Landmark Information Group Limited
- British Geological Survey (BGS) Sheet 28 of Whitehaven (1:50,000 Solid and Drift Editions)
- Environmental database information prepared by Landmark Information Group Limited
- Correspondence with Local Authorities and other Statutory Agencies
- Coal Mining Risk Assessment (CMRA) Report *E12964/1A: Coal Mining Risk Assessment for the Proposed Development of Retail Stores at Preston Street, Whitehaven, Cumbria* undertaken by DTS Raeburn in October 2016.

1.2 Ground Investigation

The main objectives of the ground investigation were to provide geotechnical information for the design of foundations for the proposed extension and to facilitate a quantitative assessment of the risk of ground contamination beneath the proposed development.

The scope of the investigation included trial pits and cable percussion boreholes to obtain samples of the underlying soils for contamination and geotechnical laboratory testing. The investigation also included gas and groundwater monitoring to identify the presence and proportions of methane (CH₄), carbon dioxide (CO₂), depleted oxygen (O₂), carbon monoxide (CO) and hydrogen sulphide (H₂S) within the soil gas and measure the extent of any groundwater beneath the site. Rotary boreholes were also included within the scope of the investigation on the recommendation of the CMRA produced for the site (E12964/1A), to determine the presence or otherwise of shallow underground coal workings and/or associated voids.

This report presents the findings of the PRA and ground investigation together with recommendations for the proposed development.

2.0 SITE AND SURROUNDING AREA

2.1 Site Location

The site comprises a roughly triangular parcel of land covering approximately 0.35 hectares and centred on National Grid Reference 297260, 517570. Plans showing the site location are included as Figures 1 and 2.

2.2 Site Description

At the time of site reconnaissance in September 2016 the site was vacant, surfaced largely by relict concrete hardstanding and heavily overgrown by vegetation, including three mature trees. However, following the completion of the ground investigation works described in this report the vegetation was cleared from site at the direction of Morbaine Limited. With the exception of a vehicular access point off Preston Street to the west of the site, the property is surrounded by a stone wall approximately 2m high.

A plan illustrating the current site layout is included as Figure 3.

2.3 Ecology/Invasive & Injurious Plant Species

No Japanese Knotweed or other injurious or invasive weeds were observed within the site boundary or immediately adjacent to the site.

2.4 Surrounding Area

The main uses of the area surrounding the site can be summarised as follows:

- The site is bounded to the north-east by a tarmac-surfaced cycle path, beyond which lies a small retail park
- An ASDA supermarket is located opposite the site to the west. The building is elevated approximately 4m above the level of the subject site, with the areas separated by a crib retaining wall
- The land adjacent the site to the south is vacant and derelict

2.5 Proposed Development

The proposed development of the site is shown in Figure 4, and consists of two non-food retail units with associated car parking and hardstanding areas.

3.0 GEO-ENVIRONMENTAL SETTING

3.1 Topography

A topographical survey drawing of the site produced by Ellam Land Surveys dated October 2004, and provided by the Client indicates that the ground level across the site slopes gently downwards from west to east, between about 9.8m and 8.2m Above Ordnance Datum (AOD).

3.2 Geological Setting

3.2.1 Geological Map Information

The geology of the site is shown by BGS Sheet 28 of Whitehaven (1:50,000 Solid and Drift Editions), from which Figure 5 has been extracted. Reference has also been made to online BGS mapping and the BGS Lexicon of Named Rock Units.

The referenced data indicates that the site is underlain by superficial strata of *Quaternary* aged alluvial deposits. These overlie bedrock geology of the *Carboniferous* Pennine Middle Coal Measures, which are reported to consist of interbedded mudstone, siltstone, sandstone and coal seams.

3.2.2 BGS Borehole Data

BGS archive data includes the records of nine boreholes drilled at distances of between approximately 20m to the north-east and 200m to the south-east of the site, together with plans indicating their approximate locations.

The boreholes indicate the presence of superficial soils, consisting initially of soft clay underlain by dense sand and gravel to depths of between about 9.5m and 17m below ground level (bgl). The superficial soils are in turn overlain by sandstone bedrock. At one location the superficial soils are reported to be overlain by 4.4m of made ground (described as colliery waste).

The presence of an apparently localised cavity at approximately 12m depth is documented in four closely-spaced boreholes drilled at about 200m to the south-east of the site. However, there is some doubt about the accuracy of these records given that the respective borehole records indicate the cavity to have been encountered before intact bedrock was met.

The BGS borehole records are reviewed in further detail in the CMRA Report (E12964/1A), and included as an appendix to that report.

3.3 Hydrology, Hydrogeology and Site Sensitivity

Enclosure A contains a series of site sensitivity maps supplied by Landmark Information Group Limited. The information shown by these maps is discussed in the following subsections:

3.3.1 Hydrology

The maps indicate that Pow Beck is culverted beneath the eastern section of the site, and that the culvert continues for approximately 200m to the south and 550m north of the site. Pow Beck is shown to be designated as a 'Primary River' by the Environment Agency (EA).

The landowner is responsible for maintenance and repair of all watercourses (whether culverted or not) within the boundary of their property. If the watercourse is adjacent the property, the boundary will be assumed to be the centre of the watercourse unless there is another physical boundary.

However, if a watercourse is classified as a Primary River, the EA have authority over the watercourse under bye-laws of the Water Resources Act 2003. In practice, this means that the EA have powers to prevent construction up to a river bank or over a culvert without leaving a suitable easement. An easement with of 8m is commonly specified although this may be reduced in specific circumstances.

Further information supplied by the Client indicates that an 800mm-diameter public sewer is also located beneath the eastern section of the site at an unconfirmed depth of 4.3m bgl. However, United Utilities have no objection to the erection of buildings above or near the sewer.

3.3.2 Hydrogeology

The maps included in Enclosure A indicate that both the superficial soils and bedrock geology are classified as Secondary 'A' Aquifers. However, there are no existing licenced groundwater abstractions within 1km and the site does not lie within 1km of a designated Groundwater Source Protection Zone.

3.4 Major Ecological Receptors

St Bees Head, a designated Site of Special Scientific Interest (SSSI) is present 780m southwest and the Cumbrian Coast Marine Nature Reserve is present 900m west. Due to the stated distances it is unlikely that these will be affected by site activities.

3.5 Flood Risk

The flood maps shown in Enclosure A indicate that the site lies within a 'Flood Zone 1', which corresponds to the lowest risk classification with respect to fluvial or tidal flooding.

3.6 Summary

The site is considered potentially sensitive with respect to controlled waters due to its location above 'Secondary A' superficial and bedrock aquifers and a culverted Primary River. However, the site is considered to be of low sensitivity with respect to major ecological receptors and is not considered to be at significant risk from fluvial or tidal flooding.

4.0 <u>SITE HISTORY</u>

The site history has been deduced primarily from a review of historical OS maps obtained from Landmark Information Group and complemented by enquiries made at the Whitehaven Local Studies Centre.

4.1 Historical Maps and Plans

Table 4.1 summarises the previous uses of the site and surrounding area as identified in maps dated between 1875 and 2016. Copies of the maps referenced in the Table are included in Enclosure B. Any identified uses of the site and the surrounding area that are considered potentially contaminative are shown in **bold italics**. The distances and directions from the site stated in the table below are approximate.

Table 4.1Review of Historical Maps

On-site	Surrounding area
<u>1840-79(1:500)</u>	
The site is occupied in its northern section by a stone yard and its southern section by a pottery. The eastern section of the property includes 'clay pans' in its eastern section.	A church is present around 10m east of the site and 50m to the south is a <i>colliery</i> , a school and play grounds. The area adjacent to the east and north east is <i>railway sidings</i> , beyond which is playing fields and bowling green. Residential housing is present within 100m west and south and 200m to the north.
	There is a significant amount of industry in the surrounding

	area beyond 100m from the site. This includes; an old <i>chemical works</i> (ruins) 100m southeast, a <i>pipe manufacturer</i> 200m south, a <i>chemical works</i> 250m south, <i>pottery</i> 200m south and 300m south, a <i>saw mill</i> and <i>timer yard</i> 200m southeast, a <i>foundry</i> (iron and brass) 220m northwest and a <i>goods station, engine works</i> and <i>timer yard</i> all around 120m north.
<u>1867 (1:10,560)</u>	
No significant changes are indicated.	The map indicates the presence of underground coal mining in the surrounding area to the west. This includes <i>Thwaite Pit</i> at about 350m to the west and <i>Arrowthwaite Pit</i> (identified as an <i>up cast mine</i>) at about 350m to the south-west. A <i>brick</i> <i>works</i> is also located at about 500m to the south of the site.
<u>1899 (1:2,500)</u>	
The former buildings have been <i>demolished</i> and the site redeveloped into an Auction Mart. This comprises a large building in the north-western section of the site and several smaller buildings (possibly outbuildings) lining the western and southern boundaries.	The <i>colliery</i> , school and old chemical works to the south and southeast have been demolished. The <i>chemical works</i> 250m to the south is no longer identified but the buildings remain. Additional buildings have been constructed in the area occupied by the <i>timber yard</i> and <i>saw mill</i> about 150m to the southeast of the site. The <i>goods station</i> 120m to the north has been <i>extended</i> or <i>redeveloped</i> into a larger building.
<u>1925 (1:2,500)</u>	1
Some small buildings have been constructed adjoining the eastern side of the large auction mart building.	The <i>timber yard</i> 120m north is no longer present. 'Old mill' <i>carpet factory</i> is now present 180m north. The <i>potteries</i> to the south are no longer identified on the map, and some of the buildings associated with them have been <i>demolished</i> .
<u>1926 (1:10,560)</u>	· <u>-</u>
No significant changes are indicated.	Haig Colliery has been constructed 500m west and includes several fairly large buildings and associated railway lines and sidings.
<u>1938 (1:2,500)</u>	
No significant changes are indicated.	No significant changes are indicated.
1957 (1:10,000) No significant changes are indicated.	The row of terraced housing from 50m to the west of the site has been <i>demolished</i> and replaced by a large industrial building.
<u>1962 (1:2,500)</u>	
Some minor structural alterations and extensions to the buildings have occurred.	The large building 50m to the west of the site is identified as a <i>factory</i> . A <i>depot</i> is present 120m east, two <i>mills</i> are identified 120m southeast and the former <i>carpet factory</i> 180m north is now identified as a <i>warehouse</i> . An unspecified <i>works building</i> has been constructed 200m north and a second <i>warehouse</i> 90m north.
<u>1975-84 (1:2,500)</u>	
No significant changes are indicated.	<i>Garages</i> have been constructed 90m northwest and 100m southwest. An <i>engineering depot</i> has been established 120m south. The <i>factory</i> identified in the previous map is now indicated to be a <i>textile factory</i> . The site of the former <i>pottery</i> 200m south is now identified as a <i>contractor's yard</i> .
<u>1994 (1:1,250)</u>	
No significant changes are indicated.	The <i>textile factory</i> about 50m west of the site has been demolished and the area redeveloped into the current retail store. Two <i>depots</i> have been constructed 100m south of the site.
<u>1996 (1:1,250) Partial</u>	
No significant changes are indicated.	The goods station adjacent the site to the north-east has

	been <i>demolished</i> and the associated <i>railway sidings</i> dismantled. The area has been redeveloped into the existing retail stores and associated car park.
<u>1999 (Aerial Photo)</u>	
The buildings onsite have been <i>demolished</i>	No significant changes are indicated.
leaving the site vacant.	
<u>2000 (1:10,000)</u>	
No significant changes are indicated.	The <i>mine</i> at Haig <i>Colliery</i> is shown to have become disused
	and the area has been <i>redeveloped</i> into an enterprise park.
<u>2016 (1:10,000)</u>	
No significant changes are indicated.	No significant changes are indicated.

4.2 Additional information

A Trade Directory from 1925 held at the Whitehaven Local Studies Centre records that the site was occupied by Whitehaven and West Cumberland Auctioneering Company at the time. The 1957 Cumberland Directory indicates that the site was still in use as auctioneers for the sale of cattle and other livestock. A corn and foraging merchant is also listed at the same address. The same directory also documents the presence of a garage and petrol filling station adjacent No. 1 Preston Street, and reference to an historic OS map from the same period indicates that this property was located approximately 20m to the north-west of the site.

Further information held by the Local Studies Centre indicates that the auction mart within the site relocated to new premises in Cockermouth (about 15 miles from Whitehaven) in 2002.

4.3 Summary

The site was in use as both a stone yard in the northern section (associated with a nearby church) and a pottery in the southern section during the mid-19th century. Around the turn of the 20th century the site was redeveloped into an auction mart, at which cattle and other livestock were sold. The site remained as an auction mart until the start of the 21st century, at which time the mart was relocated to a new premises outside Whitehaven. The site has subsequently remained vacant to the present day.

5.0 MINERAL EXTRACTION

A Coal Mining Consultant's Report obtained for the site identifies workings recorded in the Brick (Bannock) coal seam at approximately 19m depth beneath the site. The most recent recorded date of working was 1967. The report also indicates that there are no probable unrecorded coal workings at shallow depth or recorded coal mine entries within the site boundary.

Environmental database information (reviewed in Section 6.0 below) includes ten entries relating to 'deep underground coal working' within a 250m radius to the south and north-west of the site. However, all of the workings are reported to have ceased.

A Coal Mining Risk Assessment (CMRA) was completed by DTS on the basis of the forgoing information, supplemented by detailed review of published geological and historical information and available borehole records. The CMRA is presented separately in DTS Report E12964/1A. The assessment concluded the evidence shown by the various data sources with respect to underground coal workings was inconclusive, but that the possibility of shallow underground coal workings beneath the site could not be discounted given that coal mining is reported to have been undertaken in the Whitehaven area since the 17th century (long before the maintenance of coal mining records became compulsory).

The CMRA therefore recommended that an initial investigation by means of rotary open boreholes be undertaken at the site. This recommendation was taken into account in the design of the intrusive investigation works described later in this report.

6.0 ENVIRONMENTAL DATABASE INFORMATION

Table 6.1 summarises the main points of note within the environmental database information supplied by Landmark Information Group Limited. The information is included in full in Enclosure C.

	No. of incidents		Details of notable database entries		
	0- 250m	251- 500m	Distance (m) & Direction from site	Additional Information	
Land determined as 'Contaminated Land' under Part IIA of the EPA 1990	0	0	-	-	
Discharge Consents	0	0	-	Four between 660m and 1km relating to sewage and storm water. These are considered unlikely to affect the site	
Integrated Pollution Controls	2	0	205 N 220 S	Organic chemical- oxygen containing compounds. Manufacture and use of organic compounds.	
Local Authority Pollution and Prevention Controls (LAPPC)	0	2	360 NE 475 E	Both relating to PFSs.	
Prosecutions relating to controlled waters	0	0	-	-	
Pollution Incidents	2	3	185 SE 230 S 300 NE 405 SE 465 NW	Oils – Category 3- Minor Incident Fuel oil – Category 3- Minor Incident Chemicals: detergents – Category 3- Minor Incident Waste oil – Category 3- Minor Incident Chemicals: acid – Category 3- Minor Incident All the incidents are considered unlikely to affect the site due to their 'Minor' classification.	
Registered Radioactive Substances	0	0	-	-	
Water Abstractions	0	0	-	The closest abstraction is about 830m south, from surface water. The licence has been revoked.	
Historical Landfill Sites	0	0	-	-	
Local Authority Recorded Landfill Sites	0	2	300 NW 240 NW	No details included.	
Waste Management Facilities	0	1	300 N	Metal recycling (mixed)- Licence revoked.	
Waste Treatment/ Disposal Sites	1	1	185 SE 330N	Waste includes: alcohol, aldehydes and ketones, hydrocarbons, ethers and liquid waste Waste Includes: domestic appliances, ferrous and	

 Table 6.1
 Summary of Environmental Database Information

	No. of incidents		Details of notable database entries	
	0- 250m	251- 500m	Distance (m) & Direction from site	Additional Information
				nonferrous scrap, industrial scrap and scrap vehicles.
Potentially infilled land (non-water)	1	3	250 S 350 W 360 SW 370 W	Identified as 'areas of unknown filled ground', possibly corresponding to quarries or pits.
COMAH and NIHHS sites	0	0	-	-
Potentially contaminative land uses	20+ v 500m	vithin radius	All directions	Activities include a number of garage services, car dealers and tyre dealers, boat and engine builders, builder's merchants, blacksmiths and foragemasters.
PFS sites	0	3	420 NE 465 E 475 E	Active Active Inactive

The database entries also state that the risks of ground instability due to collapsible ground, ground dissolution and shrink swell clay at the site or in the immediate vicinity are very low to negligible. The risk associated with landslides and running sand is reported to be low, and the risk associated with compressible ground is reported to be moderate.

In summary, the database entries indicate a generally low risk to the site from historical pollution incidents or the authorised discharges of substances to water. A number of potentially contaminative industrial activities are identified in the surrounding area, and the potential for ground contamination to be present beneath the site as a result of these activities is discussed further in Section 7.0 below.

7.0 INITIAL CONCEPTUAL SITE MODEL (CSM)

A qualitative risk assessment of the site was undertaken utilising the information obtained in the preceding desk study section of the report in order to facilitate the development of an initial CSM. This was based on a risk-based approach and incorporated the accepted contaminant–pathway–receptor linkage approach ('pollutant linkage') outlined in Part IIa of the Environmental Protection Act 1990. This approach also follows the risk assessment framework included in CLR11 (DEFRA and EA, 2004) in which three essential elements to any risk are considered:

- A **contaminant** a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters;
- A receptor in simple terms, something that may be adversely affected by a contaminant
- A **pathway** a route or means by which a receptor can be exposed to, or affected by, a contaminant.

A risk is created only where the above three elements are linked together, and must first be established for a contaminated land hazard to exist and before any other secondary considerations are given to the effects and the need/requirement for remediation.

Table 7.1 below summarises the potential contaminants, receptors and pathways identified. Contaminants arising from the current and historical uses of both the site and surrounding area have been considered. For the purpose of this assessment the contaminants have been separated according to whether they are likely to have originated from on-site or off-site sources.

Table 7.1 Initial CSM for proposed development

Potential sources (associated contaminants)

On-site sources:
• Former use of site as an 'Auction Mart' (contamination generally considered unlikely, although
localised contamination by <i>petroleum hydrocarbons</i> is possible in areas of former oil/fuel storage)
Former redevelopment and demolition of buildings on site (Asbestos, heavy metals)
Former use of site as a pottery (sulphides, heavy metals, asbestos)
Off-site sources:
 Former railway sidings adjacent east and northeast (<i>petroleum hydrocarbons, glycols, PAH compounds, asbestos</i>)
 Former surrounding works, including; chemical works 100m SE and 250m Engine works 120m N, other unspecified works within 500m and former industrial activates including timber yard and saw mill 200m E and foundry 220 NW. (<i>petroleum hydrocarbons, metals/metalloids, chlorinated solvents and other volatile and semi-volatile organic compounds (VOC and SVOC), acidity/alkalinity, asbestos)</i> Former textile factory 50m W and carpet factory 180m N (<i>heavy metals, dyes, inorganic compounds, PAH compounds</i>) Former warehouses and railway goods station 120m N (dependant on the nature of the goods shed but could include: <i>petroleum hydrocarbons, metals/metalloids, PAH, acidity/alkalinity, asbestos</i>) Former colliery 500m W and mineral extraction including former pits 350m W and SW. (<i>heavy metals, TPH, cyanides, sulphates, PAH and acidity/alkalinity (low/high soil pH)</i>) Current/recent industrial activities within 500m reported in environmental databases, including garage services, boat builders and blacksmiths (<i>petroleum hydrocarbons, metals/metalloids, netals/metalloids, volatile and semi-volatile organic compounds (VOC and SVOC), acidity/alkalinity, asbestos</i>) Two operational and one inactive PFS within 500m E and NE of the site (<i>heavy metals, TPH, PAH, VOC and acids/alkalis</i>)
However, the primary responsibility for ground contamination occurring at the site from off-site sources would lie with the respective site owners (occupiers
Potential recentors
Humane: Construction workers, future maintenance workers, surrent and future site users
 Humans, construction workers, ruture maintenance workers, current and ruture site users Development end use: buildings, bardstandings, services and utilities
Controlled waters:
 Surface water –Pow Beck (a 'Primary River') culverted beneath the site and surfacing at about 200m south and 550m north of the site. Groundwater – Secondary 'A' Aquifer status of bedrock and superficial geology
The distance to designated major ecological receptors (between 780m and 900m from the site) suggests
that these can be discounted as potential receptors.
Potential pathways
Humans: Ingestion, skin contact, inhalation of dust and indoor and outdoor air
Development end use: Contact
Controlled waters:
• Underlying groundwater – migration, dilution and dispersion through soils into groundwater.
 Surface water –lateral migration via hydrological flow within groundwater (depending on structural integrity of the culvert).

The CSM summarises the identified potential sources of ground contamination, potential exposure/migratory pathways and potential receptors, and indicates that the accepted contaminated land hazard identification convention (contaminant–pathway receptor linkage) could potentially be completed for human receptors, the development end use and controlled waters from both on-site and off-site sources, as a result of the previous uses of the site and surrounding area. However, the linkage is unlikely to be completed with respect to ecological receptors due to their distance from the site.

An intrusive investigation was therefore undertaken at the site, with the primary objectives of providing quantitative data with respect to ground contamination and assessing the risk to the relevant receptors, as well as geotechnical data for the design of structural foundations and temporary works for the proposed development. The investigation also included rotary boreholes drilled into the underlying Coal Measures bedrock to determine the presence of otherwise of shallow underground coal mine workings or voids beneath the proposed retail buildings.

Details of the investigation undertaken are presented in Section 8.0 below.

8.0 DETAILS OF SITE INVESTIGATION

8.1 Scope and design of intrusive investigation

The investigation was undertaken between the 18th and the 27th October 2016 and comprised seven trail pits (TP1-TP7), three in situ plate load tests to obtain California Bearing Ratio (CBR) values and three cable percussion boreholes (BH1-BH3), which were continued by rotary drilling into the bedrock strata.

8.1.1 Ground Contamination Objectives

The initial CSM presented in Section 7.0 above did not identify any specific point sources of contamination that require to be targeted by the intrusive investigation. However, the investigation included trial pits positioned within the footprints of former buildings to investigate the presence or otherwise of contamination within any made ground remaining at these locations following demolition. The remaining trial pits were positioned outside the footprints of these buildings to enable non-targeted sampling and testing.

8.1.2 Geotechnical Objectives

Cable Percussion Boreholes BH1 to BH3 were positioned on the periphery of the footprint of the proposed retail buildings to enable the provision of geotechnical data for the design of foundations and temporary works for these structures. The trial pits and CBR tests were also used to provide test data for pavement design.

The cable percussion boreholes were contained from their base at bedrock by rotary open hole methods, to depth of 35m below current ground level in order to determine the presence or otherwise of mining related voids.

The following subsections describe the investigation in additional detail.

8.2 Exploratory Hole Information

8.2.1 Trial pits

Seven trial pits were excavated to depths of between 1.9m (TP7) and 4m (TP1, TP4-6 below ground level (bgl) using a JCB 3CX hydraulic excavator, under the supervision of the DTS Raeburn Site Engineer. After detailed examination, measurement and sampling, the pits were backfilled with materials arising.

8.2.2 Plate Load Tests (CBR)

Plate load tests in accordance with BS1377-9:1990 were preformed within the near surface made ground in trial pits TP1, TP2 and TP3 using the JCB excavator as kentledge. The results of the plate load tests are included as Appendix 1.

8.2.3 Cable Percussion Boreholes

Three cable percussion boreholes were drilled to practical refusal at depths of between 9.65m (BH3) and 10.4m (BH2) below present ground level. Standard cable percussion boring equipment was used to produce 150mm-diameter boreholes. Clean drilling techniques were employed at the site and included casing through the made ground in each borehole to avoid the potential for any cross-contamination between strata.

Disturbed samples were taken at frequent intervals during boring in order to give a comprehensive record of strata encountered. SPTs, as described in BS EN ISO 22476-3:2005, were also carried out during drilling to allow an assessment of the in-situ density or stiffness of the ground for foundation design.

8.2.4 Rotary 'Open Hole' Boreholes

Rotary drilling was continued from the base of each cable percussion borehole to a depth of 35m bgl. The boreholes were drilled using open-hole techniques using water as the flushing medium, as agreed with the Coal Authority, Permit Reference Number 13094. The water flush returns were monitored and recorded throughout drilling to enable any soft ground or possible voids within the strata penetrated to be identified.

8.2.5 Gas and Groundwater Monitoring Installations

The rotary boreholes were sealed with bentonite below bedrock on completion. Soil gas and groundwater monitoring standpipes were subsequently fitted into all of the boreholes targeting the overlying superficial soils. The installations comprised 63mm diameter HDPE tubes, which were perforated along differing lengths as appropriate to the ground conditions encountered and as indicated on the borehole records. The perforated sections were surrounded with clean pea gravel while the upper section of each installation comprised a bentonite seal, which was overlain by concrete securing a protective cover and gas control valve.

8.3 Soil sampling

Soil samples were collected from the trial pits by the supervising DTS Site Engineer. The guidelines in BS10175:2011 'Investigation of Potentially Contaminated Sites - Code of Practice' were followed during recovery of samples for chemical analysis. During sampling all reasonable effort was maintained to prevent cross-contamination or general failure of the sampling strategy. All samples were collected in new, clean bags or jars as appropriate using a stainless steel trowel, which was cleaned prior to the collection of each sample. The recovered samples were temporarily stored in cool boxes with freeze packs in order to maintain low temperatures during transfer to the laboratory.

Soil samples from the cable percussion boreholes were collected by the drilling crew in new clean bags or containers using appropriately cleaned tools. The samples were inspected and logged by a DTS Raeburn Engineer.

8.4 Soil Gas and Groundwater Monitoring

The depth to groundwater and the concentrations of carbon dioxide, methane, oxygen, carbon monoxide and hydrogen sulphide within the borehole installations were recorded on four occasions during November 2016. The barometric pressure and gas flow rates were also recorded.

8.5 Records of fieldwork

Detailed records of the boreholes have been produced in accordance with BS5930:2015, and are included as Appendix 2. Details of the borehole installations are given on the respective borehole

logs. The gas and groundwater monitoring results are presented in Table A, which immediately follows the report text.

9.0 LABORATORY TESTING

9.1 Soil contamination testing

Table 9.1 lists the contamination tests performed on soil samples during the present investigation, together with a brief summary of the purpose of each test.

Table 9.1	Soil Contamination 1	fests

Test	No. of tests	Purpose
Suite of contaminants including	10	
metals, phenols, sulphate and sulphide ¹		Tests generally non-targeted, and included analysis for
Speciated total petroleum	10	determinants appropriate to the previous uses of the site,
hydrocarbons (TPH ²)	10	as identified by the initial CSM
Polycyclic aromatic hydrocarbons	10	
(PAH ³)		
Asbestos screen	8	No fragments of asbestos observed during fieldwork but
		samples of made ground were subjected to laboratory
		screening tests
Leachability testing for a series of	3	
parameters as required by the		Used in conjunction with the above analyses to classify
Waste Acceptance Criteria (WAC)		surplus soils for off-site disposal.

¹ The tested determinants comprised arsenic, cadmium, chromium, lead, mercury, copper, nickel, selenium and zinc.

² TPH were speciated into aliphatic C₅-C₆, C₆-C₈, C₈-C₁₀, C₁₀-C₁₂, C₁₂-C₁₆, C₁₆-C₂₁, C₂₁-C₃₅ and C₃₅-C₄₀ and aromatic C₆-C₇, C₇-C₈, C₈-C₁₀, C₁₀-C₁₂, C₁₂-C₁₆, C₁₆-C₂₁, C₂₁-C₃₅, C₃₅-C₄₀ carbon chain lengths. The tests also included BTEX compounds (benzene, toluene, ethylbenzene and xylene).

³ PAH were speciated into the USEPA-16 'priority pollutants'.

9.2 Geotechnical testing

Three soil samples were subjected to chemical analysis to determine their soluble sulphate content and pH value. These data are used in conjunction with total (acid soluble) sulphate and total sulphur (part of the contamination test suite detailed in Table 9.1 above) to assess the risk of sulphate attack to buried concrete and determine the necessary design classification.

Six samples were also subject to moisture content and plasticity index tests to assess the shrinkage and swelling potential of the clay soil. A further two samples were subjected to undrained shear strength tests.

9.3 Results of laboratory tests

The laboratory tests were performed by Terra Tek Limited to both UKAS and MCERTS accreditation where applicable. The soil contamination and geotechnical test results are included as Appendices 3 and 4 respectively.

10.0 SUCCESSION OF STRATA

10.1 Ground levels

The mean ground level at the positions of boreholes and trial pits is 8.62mAOD (range 8.2mAOD to 10.0mOD).

10.2 Records of boreholes and trial pits

Table 10.2 is a summary of the records of boreholes and trial pits; detailed descriptions of strata are given in the borehole records presented in Appendix 2.

Stratum	top of	stratum	base of	stratum	mean
	mean depth	mean level	mean depth	mean level	thickness
	(m)	(mOD)	(m)	(mOD)	(m)
	[range, m]	[range, mOD]	[range, m]	[range, mOD]	[range, m]
made groundconcreteorbrickpaving in some areas;clayeyclayeysandygravelwith ash; some cobblesofmudstone,sandstone,brick&coalrareashlarmasonry blocks in TP7. $2 \leq N \cong 4$	0	8.62 [8.2 to 10.0]	2.01 [1.2 to 3.2]	6.62 [5.0 to 7.6]	2.01 [1.2 to 3.2]
alluvium soft sandy clay; organic remains, peat	2.01 [1.2 to 3.2]	6.62 [5.0 to 7.6]	3.21 [2.4 to 4.8]	5.48 [4.1 to 7.2]	1.34 [0.4 to 2.2]
river terrace deposits medium dense sand with gravel of sandstone and mudstone N = 15, 16	3.21 [2.4 to 4.8]	5.48 [4.1 to 7.2]	4.63 [4.2 to 5.0]	4.70 [4.1 – 5.3]	0.27 [0 to 0.8]
clay till firm, stiff and very stiff gravelly clay; some cobbles of sandstone and mudstone $40 \le N \le 72$	4.63 [4.2 to 5.0]	4.70 [4.1 – 5.3]	10.00 [9.3 to 11.1]	-0.67 [-2.9 to 0.7]	5.37 [4.6 to 6.9]
sandstone with mudstone bands	10.00 [9.3 to 11.1]	-0.67 [-2.9 to 0.7]	27.50 [24.8 to 29.1]	-18.17 [-19.1 to -16.6]	17.50 [13.7 to 19.8]
coal contains mudstone band in BH1	27.50 [24.8 to 29.1]	-18.17 [-19.1 to -16.6]	27.50 [24.8 to 29.1]	-18.17 [-19.1 to -16.6]	2.03 [1.9 to 2.2]
mudstone with sandstone bands	27.50 [24.8 to 29.1]	-18.17 [-19.1 to -16.6]	base not reached in boreholes		-

Table 10.2Succession of strata

No loss of flush returns was encountered during drilling of the rotary boreholes, indicating the absence of any coal mining related voids.

10.3 Ground water

No groundwater was encountered during the drilling of the boreholes. The groundwater level was monitored in standpipe installations fitted to BH1- BH3 on four occasions between 03.11.16 and 24.11.16. During the monitoring visits, groundwater levels (mAOD) between the three boreholes were variable, and some deviation was also recorded between site visits (specifically within BH2).

Table 10.3 gives the minimum and maximum depth to ground water level recorded at each borehole.

Number of monitoring visits: 4		Date of monitoring visits: 03/11/16 09/11/16 18/11/16 24/11/16				
	BH1 (m bgl)	BH1 (m AOD)	BH2 (m bgl)	BH2 (m AOD)	BH3 (m bgl)	BH3 (m AOD)
Maximum water	6.60	3.15	1.30	6.95	2.38	7.62
level						
Minimum water	7.75	2.00	4.86	3.39	2.53	7.47
level						

Table 10.3	Depth to ground water level
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The reason for the large differences in water levels in BH1-BH3 is unclear but may indicate separate bodies of perched ground water.

11.0 **GROUND CONTAMINATION APPRAISAL**

11.1 Soil Contamination Assessment Methodology

The ground contamination appraisal has been undertaken based on a risk-based approach and incorporating the accepted 'pollutant linkage' outlined in Part IIa of the Environmental Protection Act 1990, and introduced in Section 7.0.

The detailed appraisal of the soil contamination at the site has followed the tiered procedure adopted in CLR11 and repeated below:

- Development of a CSM summarising the identified pollutant linkages at the site (Preliminary Risk Assessment)
- Selection of appropriate generic screening criteria and comparisons to the measured contaminant concentrations (Generic Quantitative Risk Assessment)
- Derivation of site-specific values where the determinants exceed the generic screening criteria as appropriate (Detailed Quantitative Risk Assessment).

The main advantage of the tiered procedure is that it enables low risk sites and determinants to be screened out early, hence enabling attention to be focused in higher risk areas.

11.2 Preliminary Risk Assessment

An initial CSM was presented in Section 7.0. The present investigation has confirmed the presence of naturally occurring alluvial soils (comprising soft organic clay overlying medium dense gravelly sand) and shown these to be overlain by between about 1m and 3m of made ground. However, no visual or olfactory evidence of contamination was noted during the fieldwork.

The investigation has also shown that the alluvium is separated from the bedrock geology by a layer of Glacial clay till, which is classified as 'unproductive strata' and is therefore likely to inhibit the

continued downward migration of any contaminants to the bedrock aquifer. In addition, the Coal Measures bedrock beneath the site has been shown to consist primarily of mudstone, the permeability of which would be expected to be less than (or at worst case, comparable to) a clay soil. On the basis of the foregoing observations, it is considered that a plausible 'pollutant linkage' to the bedrock aquifer is unlikely to be completed at the site. However, further evaluation of the risk to shallow groundwater within the superficial soils has been undertaken and is discussed further in Section 11.3 below.

11.3 Quantitative Risk Assessment

For the various receptors, appropriate screening criteria relevant to the potential 'pollutant linkages' were selected. These are summarised below:

11.3.1 Receptor: Short-term Human Health (Construction Workers)

The risk of exposure to ground workers from contaminated materials is considered short-term and should be mitigated by taking account of the relevant Health and Safety Executive (HSE) Guidance on Workplace Exposure Limits (EH40/2005, 2nd Edition 2011). A Health and Safety Hazard Assessment for the detailed undertakings should be carried out as stipulated under the Construction Design and Management (CDM) Regulations 2007, with due regard to the laboratory test results included in Appendix 3. A Working Health and Safety Plan should be prepared, which mitigates the potential risks/hazards to site workers from the specific undertakings as identified in the Hazard Assessment.

In general, the risks of exposure by ground workers should be mitigated by the use of site personal protective equipment (PPE) consisting of overalls, gloves and suitable protective footwear and headgear. Further advice on PPE is given in HSE Publication HS(G)66 (1991) 'Protection of Workers and the General Public During Development of Contaminated Land'.

11.3.2 Receptor: Long-term Human Health (Site End Users) and Proposed Development End Use

The maximum contaminant concentrations detected by laboratory testing have been compared directly to GAC selected from the sources below (listed in order of preference). The range of results for each determinant is present in Table 11.1 below together with the adopted assessment criteria.

- 1. CLEA Model Soil Guideline Values (SGVs), published by the Environment Agency (March June 2009).
- 2. Suitable for Use Levels (S4ULs) published by Land Quality Management Limited (LQM) and the Chartered Institute of Environmental Health (CIEH) (2015).
- Generic Assessment Criteria (GAC) derived by DTS Raeburn using the CLEA UK (Version 1.06) Model 2009. The derivation of these GAC has taken account of the relevant TOX data and published literature information regarding chemical properties. The standard parameters for a commercial development end use and a UK sandy loam soil have been assumed.

Where necessary a soil organic matter (SOM) concentration of 6% has been assumed. This is considered suitably conservative based on the results of site specific testing for TOC.

Exceedances of the GAC are identified in **bold** text in the table below where appropriate.

Table 11.1	Assessment of Soil Contamination	Test Results
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			mg/kg		
Determinant	Number of Samples	Maximum Value	Assessment Criteria	Source of Criteria	
arsenic	10	110	640	1	
cadmium	10	<1*	230	1	
chromium (total)	10	32	3000	2	
copper	10	370	72000	2	
lead	10	2800	5,800	3	
Selenium	10	<3*	13,000	1	
mercury (inorganic)	10	2	3,600	1	
Nickel	10	81	980	1	
Zinc	10	260	730,000	2	
Phenol ¹	10	1.9	3700	2	
total cyanide	10	0.9	16,000	3	
РАН					
Acenapthene ²	10	0.93	100000	2	
Acenaphthylene ²	10	0.95	100000	2	
anthracene	10	2.10	540,000	2	
benzo(a)anthracene	10	22.72	180	2	
benzo(a)pyrene	10	28.59	36	2	
benzo(b)fluoranthene	10	28.13	45	2	
benzo(g,h,i)perylene	10	20.46	4000	2	
benzo(k)fluoranthene	10	15.08	1,200	2	
Chrysene	10	19.11	350	2	
dibenzo(a,h)anthracene	10	5.8	3.6	2	
Fluoranthene	10	27.69	23,000	2	
Fluorine ²	10	0.84	71000	2	
indeno(1,2,3-cd)pyrene	10	20.67	510	2	
Naphthalene ²	^{,3} 10	0.96	1100	2	
Phenanthrene	10	10.42	23,000	2	
Pyrene	10	24.66	54,000	2	
TPH and BTEX				Ι	
aliphatic TPH C ₅ -C ₆	10	<0.01*	1150	2	
aliphatic TPH C ₆ -C ₈	1	<0.01*	738	2	
aliphatic TPH C ₈ -C ₁₀	10	<1*	450	2	
aliphatic TPH C ₁₀ -C ₁₂	10	<1*	283	2	
aliphatic TPH C ₁₂ -C ₁₆	10	3	142	2	
aliphatic TPH C ₁₆ -C ₃₅	10	13	1,800,000	2	
aliphatic TPH C ₃₅ -C ₄₀	10	<1*	1,800,000	2	
aromatic TPH C ₆ -C ₇	10	0.030	4710	2	
aromatic TPH C ₇ -C ₈	10	0.034	4360	2	
aromatic TPH C ₈ -C ₁₀	10	0.033	3580	2	
aromatic TPH C ₁₀ -C ₁₂	10	<1*	2150	2	
aromatic TPH C ₁₂ -C ₁₆	10	<1*	38000	2	
aromatic TPH C ₁₆ -C ₂₁	10	17	28,000	2	
aromatic TPH C ₂₁ -C ₃₅	10	86	28,000	2	
aromatic TPH C ₃₅ -C ₄₀	10	6	28,000	2	
Benzene	10	0.030	90	2	

Toluene ³	10	0.034	4360	2
Ethylbenzene ³	10	0.008	2840	2
m&p-xylene ^{3,4}	10	0.017	2620	2
o-xylene	10	0.007	4170	2

¹Based on a threshold protective of direct skin contact with phenol (most conservative)

² Calculated using TOX data for inorganic cyanide (R&D Publication TOX5, DEFRA and EA, 2002)

³ SGV/GAC capped at the lower of the vapour or aqueous saturation limits in soil

⁴ GAC for p-xylene (most conservative)

* Below laboratory detection limits

Table 11.1 indicates that the maximum detected concentrations of all of the tested determinants were below the respective GAC, with the exception of the PAH compound dibenzo(a,h)anthracene at one location only (TP3, 0.5m bgl).

However, the CLEA UK (V1.071) software package indicates that over 90% of exposure to humans to dibenzo(a,h)anthracene is by ingestion and skin contact, with the inhalation pathway contributing less than 1% of total exposure. Therefore, the proposed construction of buildings and carpark hardstanding in the vicinity of TP6 will be suitable to mitigate the risk of exposure to site end users from dibenzo(a,h)anthracene.

In addition, no fibres or fragments of asbestos containing materials were detected in any of the samples of made ground screened.

On the basis of the foregoing it is considered that the levels of contamination in the test soils present a sufficiently low risk to long-term human health and the proposed development end use.

11.3.3 Receptor: Controlled Waters

A quantitative assessment of the risks to groundwater within the superficial soils beneath the site and the culverted Pow Beck has also been undertaken by means of laboratory analysis of groundwater samples recovered from BH1 to BH3. The results of these analyses are presented in Appendix 5.

The results of the groundwater analysis are summarised in Table 11.2. The Table also includes a comparison of the maximum detected concentrations to the relevant GAC selected from the sources listed below:

- 1. GW-TV incorporated by the River Basin district Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010.
- 2. EQS for individual substances in fresh water. These have been selected assuming a water hardness of 50mg/l CaCO₃ (most conservative).

Table 11.2 Groundwater Contamination Te	est Results
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	Number	μg/I		Location of
Determinant	of Samples	Maximum Value	GAC (source)	Exceedance(s)
arsenic	3	12.6	7.5 (1)	BH2
cadmium	3	0.06	3.75 (1)	-
chromium (total)	3	1.11	37.5 (1)	-
copper	3	6.7	1500 (1)	-
lead	3	0.09	7.5 (1)	-
mercury (inorganic)	3	0.21	0.75 (1)	-
nickel	3	17.9	15 (1)	BH2
zinc	3	15.2	12.3 (2)	BH2

	Number	μg/l		Location of
Determinant	of Samples	Maximum Value	GAC (source)	Exceedance(s)
boron	3	<0.3	750 (1)	-
phenol	3	<0.5	7.7 (2)	-
sulphate	3	152	188000 (1)	-
РАН				
naphthalene	3	<0.01	2 (2)	-
anthracene	3	<0.01	0.1 (2)	-
fluoranthene	3	<0.01	0.0063 (2)	-
benzo(a)pyrene	3	<0.01	0.00075 (1)	-
benzo(b)fluoranthene & benzo(k)fluoranthene	3	<0.01	0.075 (1)	-
benzo(g,h,i)perylene & indeno(1,2,3-cd)pyrene	3	<0.01	0.1 (2)	-
ТРН			•	
aliphatic C5-C6	3	<10		-
aliphatic C ₆ -C ₈	3	<10		-
aliphatic C ₈ -C ₁₀	3	<10		-
aliphatic C ₁₀ -C ₁₂	3	<10		-
aliphatic C ₁₂ -C ₁₆	3	<10		-
aliphatic C ₁₆ -C ₂₁	3	<10		-
aliphatic C ₂₁ -C ₃₅	3	<10		-
aliphatic C ₃₅ -C ₄₄	3	<10	101	-
aromatic EC5-EC7	3	<10	10	-
aromatic EC7-EC8	3	<10		-
aromatic EC ₈ -EC ₁₀	3	<10		-
aromatic EC ₁₀ -EC ₁₂	3	<10		-
aromatic EC ₁₂ -EC ₁₆	3	<10		-
aromatic EC ₁₆ -EC ₂₁	3	<10		-
aromatic EC ₂₁ -EC ₃₅	3	<10		-
aromatic EC ₃₅ -EC ₄₄	3	<10		-
benzene	3	<1	0.75 (1)	-
toluene	3	<1	74 (2)	-
ethylbenzene	3	<1	10 ¹	-
m&p-xylene	3	<2	10 ¹	-
o-xylene	3	<1	10 ¹	-

¹ in the absence of a published assessment criteria, a national screening value of 10µg/l has been adopted.

Table 11.2 identifies that the concentrations of all the tested determents are below the respective GAC, with the exception of arsenic, nickel and zinc in BH2 only. However, given the apparently localised spatial distribution of these determinants in groundwater beneath the site, together with the observations made during groundwater monitoring which indicates that the groundwater present in the boreholes may represent separate bodies of perched groundwater beneath the site rather than a single continuous Groundwater Table, it is considered that the exceedences detected are sufficiently low in practical terms not to warrant any further site-specific risk assessment or remedial action.

The groundwater contamination test results also show that dibenzo(a,h)anthracene concentrations were below laboratory detection limits in all of the groundwater samples tested. This observation provides assurance that the presence of localised elevated concentrations of dibenzo(a,h)anthracene in soils does not present an unacceptable risk to controlled waters.

11.4 Off-site Disposal of Surplus Soils

The contamination test results, which included Waste Acceptance Criteria (WAC) soil and leachate analyses indicate that the made ground (around 0.5m bgl) in the vicinity of TP6 would fall into the hazardous waste classification if removed from site, due to the presence of lead in excess of the hazardous waste threshold of 1,000mg/kg.

The soils tested were recovered from close to a below-ground lead pipe, and similarly elevated concentrations were not detected in the made ground recovered from any of the other exploratory holes. It is therefore likely that the hazardous waste soils are localised to the vicinity of the lead pipework.

The made ground tested from the remaining exploratory holes could be classified for off-site disposal as non-hazardous waste provided that the soils were segregated from the hazardous waste made ground encountered at TP6. However, as the made ground at TP6 is visually similar to that encountered at the nearby TP3 and TP5, segregation on site by visual means may be problematic. Therefore, if the off-site disposal of any made ground from the vicinity of TP6 is required, it would be prudent to undertake a limited amount of additional soil sampling and testing to determine the extent of hazardous waste soils present in this area and enable them to be segregated from the surrounding non-hazardous waste material.

The concentration of lead detected in the made ground at TP6 would not prevent the material from being re-used on site beneath the proposed development.

The results of analysis of the natural soils indicate that these would qualify for off-site disposal as inert waste under the Landfill (England and Wales) (Amendment) Regulations 2004.

These recommendations are for guidance purposes only and subject to the Landfill Operator's certification.

11.5 Soil gas

Table 11.3 summarises the soil gas results from four monitoring visits undertaken during November 2016. The detailed results are included in Table A, which follows the report text.

Number of monitoring	Date of monitoring visits: 03/11/16 09/11/16 18/11/16 24/11/16							
	Pressure (mb)	CH₄ (%)	CH4 CO2 (%) (%)		H₂S (ppm)	O2 (%)	Flow (l/hr)	
Maximum	1028	0.1	5.8	61	6	19.5	5.9	
concentration								
Minimum	984	0.0	0.5	0	0	5.2	-3.8	
concentration								

Table 11.3Summary of Soil Gas Monitoring Data

Multiplication of the maximum carbon dioxide concentration by the maximum gas flow rate, in accordance with the framework presented in CIRIA Report C665 (2007) gives a calculated gas screening value¹ of 0.054 litres/hour. This value falls into 'Characteristic Situation' Classification CS-1. However, the CIRIA guidance advises that "consideration should be given" to increasing the site classification to CS-2 if concentrations of either CH_4 or CO_2 exceed 1% or 5% by volume respectively.

 $^{^{1}}$ Gas screening value is calculated by multiplying the maximum concentration of either CO₂ or CH₄ by the maximum flow rate. This is highly conservative in the present case because the maximum CO₂ concentration and gas flow rates were measured in separate boreholes.

In the present case, CO_2 concentrations marginally exceeded 5% in one borehole installation during one monitoring visit only. The maximum concentration was measured during a period of high atmospheric pressure (1028mb) and the corresponding gas flow rate was negligible (0.2 litres/hour). An earlier monitoring visit during a period of low atmospheric pressure (984mb) revealed a maximum CO_2 concentration of 2.2% by volume and a gas flow rate of 0.2 litres/hour at the same location. These observations suggest that higher concentrations of CO_2 are unlikely to be measured during less favourable weather conditions.

On the basis of the foregoing, it is considered that a 'CS-1' classification is appropriate for the site.

BS8485:2015 identifies suitable levels of gas protection depending on the CS classification and the type of building to be constructed. The proposed retail units at the site would constitute 'Type C' buildings, for which no gas protection is required at sites within a 'CS-1' classification.

The above referenced guidance does not take account of CO concentrations. However, a maximum peak concentration of 61ppm was detected during the first monitoring visit only, and had reduced to zero within three minutes. This suggests that the long-term Workplace Exposure Limit (WEL) of 30ppm (8-hour time-weighted average) is highly unlikely to be exceeded at the site. It is also noted that the maximum peak CO concentrations detected during the subsequent monitoring visits were below 30ppm, indicating that the initial concentration may have been caused by ground disturbance during drilling. On the basis of the foregoing, it is considered that gas protection measures are not required with respect to CO.

BRE Report BR 211 (2007) indicates that no radon protection measures are necessary in the construction of new buildings on the site. However, subsequent guidance issued by Public Health England (PHE, formerly HPA) recommends that basic radon protection measures should be included in all new and refurbished buildings regardless of their location. Such protection is not mandatory but can be afforded by the inclusion of a well-installed damp-proof membrane of minimum 1200-guage, extended across the ground floor slab.

12.0 ENGINEERING PROPERTIES OF STRATA

12.1 Water content and Atterberg limits for fine-grained soils

Tables 12.1(a), (b) and (c) give summaries of the measured water content, liquid limit and plastic limit for specimens of fine grained soils; the derived plasticity index² and liquidity index³ are included also.

Table 12.1(a)	specimens nom											
	water content liquid limit		plastic limit	plasticity	liquidity							
	(%)	(%)	(%)	index	index							
mean	45.8	60.2	29.8	30.4	0.52							
minimum	28	38	18	20	0.36							
maximum	60	75	37	41	0.71							

Table 12.1(a) Specimens from TP1-TP6 in the depth range 1.5m to 2.2m	n (5 specimens))
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Soil classification: clay of intermediate to very high plasticity with medium to high shrinkage and swelling potential

² The plasticity index I_P is the numerical difference between the liquid and plastic limits.

³ The liquidity index I_{L} is a rough indicator of undrained shear strength. An index of zero is typical of stiff clay; for extremely soft clay $I_{L} \rightarrow 1$.

	water content (%)	liquid limit (%)	plastic limit (%)	plasticity index	liquidity index
mean	11.4	25.0	13.4	11.6	-0.133
minimum	28	38	18	20	-0.333
maximum	60	75	37	41	0

Table 12.1(b) Specimens from BH1-BH3 in the depth range 5.2m to 8.7m (5 specimens)

Soil classification: clay of low plasticity having low shrinkage and swelling potential

	Table 12.1(c)	Specimen	from BH2	at 3.7m	(1 specimen
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water content	liquid limit	plastic limit	plasticity	liquidity		
(%)	(%)	(%)	index	index		
91	120	54	66	0.561		

Soil classification: organic silt of extremely high plasticity and very high shrinkage and swelling potential

12.2 Undrained shear strength

Table 12.2 gives the leading results of two laboratory tests to measure the undrained shear strength for core specimens of clay.

Table 12.2	Ullula	ineu shear strength	
borehole	depth (m)	water content (%)	undrained shear strength (kPa)
1	5.4	13	90
3	5.4	13	40

Table 12.2Undrained shear strength

12.3 Standard Penetration Tests

Standard Penetration Tests (SPTs) were performed in BH1-BH3 at frequent depth intervals. Each test result is expressed by an N-value, which is the blow-count from a calibrated free-fall drop hammer needed to cause a standard penetrometer to advance 300mm into the soil.

Figure 6 shows N-values plotted against depth below ground level.

For clays of low to intermediate plasticity the undrained shear strength c_u may be related empirically to the SPT N-value:

 $c_u(kPa) \cong 5 \times N \tag{1}$

For clay soils Figure 7 shows undrained shear strength plotted against depth below ground level. In descending order of reliability the shear strength is represented by:

- (i) direct measurements of c_u;
- (ii) c_u estimated from N using Eqn 1; and
- (iii) c_u estimated from the liquidity index⁴.

The bi-linear best-fit relationship is an assessment based on available evidence. (Some excessively high N-values in the depth interval 7m to 8m are thought to have been caused by encounters with large gravel particles and have been excluded from consideration.) The best-fit relationship is given by

 $\begin{array}{ll} N=8.3z+7.5 & \text{in the interval } 1.5m \leq z \leq 4.5m \\ \text{and} & N=35.5z-114.5 & \text{in the interval } 4.5m \leq z \leq 10.0m \end{array}$

 $^{4}c_{u}(kPa) \cong 100^{(1-I_{L})}$

in which z is the depth below ground level.

12.4 California Bearing Ratio and modulus of subgrade reaction

Table 12.4 gives the results of three in situ plate loading tests carried out to measure the California Bearing Ratio (CBR) and modulus of subgrade reaction K. Test results are also presented in Appendix 1.

Table 12.4	California Bearing Ratio and modul								
test	CBR (%)	K (MPa/m)							
1	16.0	72							
2	9.9	55							
3	11.3	59							

is of subgrade reaction

Note: units of the modulus of subgrade reaction are sometimes given as MN/m³.

13.0 **GEOTECHNICAL ASSESSMENT**

13.1 **Proposed development**

Two non-food retail units are to be built in approximately the southern half of the site, and part of the northern half is to be used for car parking.

13.2 **Ground conditions**

There is 1m to 3m of largely granular, very loose made ground overlying 0.5m to 2m of natural alluvial soils. Much of the alluvium is peat and peaty silty clay having very high plasticity and high shrinkage and swelling potential. Below 4.5m-depth there is firm, stiff and very stiff clay till with low plasticity and low shrinkage and swelling potential.

The depth to ground water level ranges from 2.0mAOD (BH1) and 7.62mAOD (BH3); the variation may be evidence of separate bodies of perched ground water.

13.3 **Foundations**

Shallow pad and strip foundations cannot be recommended because the near-surface soils are very weak and highly compressible to a depth of 4.5m. Vibro-replacement stone columns would offer no significant benefit.

Piled foundations are recommended. Advice on the selection and design of piles should be obtained from specialist piling contractors; the following comments are offered only for general guidance.

13.3.1 **Continuous flight auger (CFA) piles**

Table 13.31 gives the estimated design bearing resistance for a single CFA pile of diameter (d) and length (L) from present ground level. No shaft resistance has been included for the uppermost 4.5m of weak and compressible made ground and alluvium. In accordance with Eurocode 7 a partial factor γ_t of 2.8 has been applied to the total of the ultimate shaft and base resistances⁵.

⁵ Applying a partial factor to the total resistance proved more critical than applying separate partial factors to the shaft and base resistances.

pile length L	estimated design bearing resistance (kN)								
(m)	d = 0.3m	d = 0.4m	d = 0.5m						
6	40	65	90						
8	100	150	210						
10	190	275	370						

Table 13.31Estimated design bearing resistance for a CFA pile

13.3.2 Driven precast jointed piles

Driven precast jointed piles end-bearing in the underlying sandstone and mudstone bedrock would offer larger bearing resistances than those given in Table 13.31 for CFA piles. The bearing resistance of a pile driven to a satisfactory set on rock usually depends on the strength of the pile concrete rather than that of the rock. Table 13.32 gives the estimated design bearing resistance of a single vertical driven jointed pile of cross-section b×b bearing in rock at about 11m below present ground level.

Table 13.32 Estimated design bearing resistance for a driven jointed pil	е
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pile cross-section (mm×mm)	250×250	300×300	350×350
estimated design bearing	390	560	760
resistance (kN)			

13.4 Ground floor slabs

Suspended ground floor slabs are recommended because of the high compressibility of the alluvial organic soils.

13.5 Shrinkage and swelling potential

The high shrinkage and swelling potential of the near-surface organic soils should not cause damage to piled foundations and suspended floor slabs.

13.6 Pavement of car parking area

Existing paving, topsoil and other unsuitable materials should be removed and the proposed formation level should be proof-rolled. Any excessively soft material should be removed and replaced by compacted hardcore. New surfacing should be designed for a California Bearing Ratio (CBR) of 5%, in order to reduce the risk of settlement of paved areas above organic soils which were not specifically targets by the plate bearing tests. Flexible paving is recommended.

13.7 Buried Concrete

The soluble sulphate concentrations detected in the tested soils and groundwater fall into Design Sulphate Class DS-1 of Special Digest 1 (3rd Edition, BRE, 2005). The soil pH values together with the presence of groundwater beneath the site indicate an Aggressive Chemical Environment for Concrete (ACEC) Class of AC-1.

However, the results of analysis for total (acid soluble) sulphate and total sulphur indicate the likely presence of pyrite within the made ground. It is therefore also necessary to take account of the total potential sulphate (TPS, calculated by 3x total sulphur). The test results indicate a 'characteristic value' for TPS of 0.7%, which falls into Design Sulphate Class DS-3 and a corresponding ACEC Class of AC-3.

It is therefore recommended that any buried concrete placed in direct contact with the made ground should conform to Design Sulphate Class DS-3 and ACEC Class AC-3. However, the presence of pyrite is not a significant consideration for piled foundations, the construction of which minimises the disturbance of the soil and thus the potential for oxidation of pyrite to sulphate. The specification for piled foundations could therefore be reduced to Classes DS-1 and AC-1.

14.0 LIMITATIONS AND USE OF THIS REPORT

IMPORTANT: This section should be read before reliance is placed on any of the opinions, advice, recommendations and conclusions contained in this report.

- a) This report has been prepared at the request of Morbaine Limited ('the Client') pursuant to their appointment of DTS Raeburn Limited in connection with the intrusive investigation;
- Except for Morbaine Limited, no duty is undertaken or warranty or representation made to any party in respect of the opinions, advice, recommendations or conclusions contained in this report;
- c) All work carried out in preparing this report has used, and is based upon DTS Raeburn's professional knowledge and understanding of the current (October 2016) relevant English, Scottish and European Community standards and codes, technology and legislation. Changes in the above may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. Following delivery of this report, DTS Raeburn will have no obligation to advise the Clients of any such changes or of their effects. It may therefore be necessary to review the opinions, advice, recommendations and conclusions of this report following future changes to legislation;
- d) Some of the information referenced and included in the PRA has been provided by third parties and whilst DTS Raeburn has no reason to doubt the accuracy, these items have not been verified. DTS Raeburn accepts no responsibility for errors within third party materials referenced and presented in this report;
- e) DTS Raeburn acknowledge that they are being retained, in part, because of their knowledge and experience with respect to geotechnical and environmental matters. DTS Raeburn will consider and analyse all information provided in the context of their knowledge and experience and all other relevant information known to DTS Raeburn. To the extent that the information provided to DTS Raeburn is not inconsistent and/or incompatible therewith, DTS Raeburn shall be entitled to rely upon and assume, without independent verification, the accuracy and completeness of all such information,
- f) The opinions expressed in this report are based on the ground conditions revealed by investigation, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are only for guidance and no liability can be accepted for their accuracy;
- g) The groundwater and ground gas conditions entered on the various records are those observed at the time of investigation and subsequent monitoring. Groundwater is subject to seasonal variation or changes in local drainage conditions. Ground gas levels may vary depending on variations in weather conditions particularly barometric pressure. Rates of decomposition / degradation of organic matter in the underlying soils can also affect the generation of ground gases;

- h) The content of this report represents the professional opinion of experienced geotechnical and environmental specialists. DTS Raeburn does not provide associated legal advice and appropriate legal advice should be sought if required;
- i) The lack of evidence of the presence of hazardous materials, voids or obstructive features at the subject property does not guarantee the absence of such materials/features, rather it indicates only that none was found as a result of the services provided.

DTS RAEBURN LTD

E12964/1B – November 2016

References

- Department for Environment, Food and Rural Affairs and the Environment Agency Contaminated Land Report 11: Model procedures for the management of land contamination 2004
- British Standards Institution
 Investigation of Potentially Contaminated Sites Code of Practice
 BS10175: 2011
- British Standards Institution
 BS EN ISO 22476-3:2005
 Geotechnical investigation and testing. Field testing. Standard penetration test
- iv) British Standards Institution
 BS 5930:2015
 Code of Practice for Site Investigation
- v) Health and Safety Executive
 Workplace Exposure Limits (as amended)
 HSE Publication EH40/2005 (2nd Edition, 2011).
- Vi) Health and Safety Executive
 Protection of Workers and the General Public During Development of Contaminated Land
 HSE Publication HS(G)66
 1991
- vii) ntrol of Asbestos Regulations 2012. ry Instrument 2012 No. 632
- viii) Environment Agency Contaminated Land Exposure Assessment (CLEA) UK Model (Version 1.06) Science Reports SC050021/SR2, SR3, arsenic, cadmium, mercury, selenium, nickel, phenol, benzene, toluene, ethylbenzene and xylene SGVs 2009
- ix) Nathanial, C.P., McCaffery, C., Ashmore, M.H., Cheng, Y.Y., Gillett, A., Ogden, R. and Scott, D. The LQM/CIEH Suitable 4 Use Levels. Land Quality Press, Nottingham, 2015.
- x) Department for Environment, Food and Rural Affairs and the Environment Agency R&D Publications TOX 5 (inorganic cyanide) and TOX 6 (lead) 2002
- xi) BRE Concrete in aggressive ground Special Digest 1 (3rd Edition), 2005.
- xii) The Landfill (England and Wales) (Amendment) Regulations 2004 Statutory Instrument 2004 No. 1375

- xiii) Wilson, S., Oliver, S., Mallett, H., Hutchings, H. and Card, G.
 Assessing risks posed by hazardous ground gases to buildings (revised).
 Construction Industry Research and Information Association (CIRIA) Report C665, 2007
- xiv) British Standards Institution
 Code of Practice for Characterization and Remediation From Ground Gas in Affected
 Developments (2nd Edition)
 BS 8485:2015
- xv) British Standards Institution
 BS EN 1997-1: 2004
 Geotechnical Design General Rules
- xvi) British Standards Institution
 BS EN 1997-2: 2007
 Geotechnical Design Ground Investigation and Testing
- xvii) British Standards Institution UK National Annexes to BS EN 1997-1:2004 & BS EN 1997-2:2007

Project: E12964/1 Whitehaven

Date: 03/11/2016

Atmospheric Pressure: 1014mb Steady

Weather: Overcast/raining

	Groundwater		Flow	Rate	Gas Concentration (by volume)									
Borehole	Level	Groundwater	(1/	'nr)	CH	. (%)	CO	<u>2</u> (%)	O2	(%)	H₂S (ppm)	CO (ppm)
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	21.0	21.0	0	0	0	0
BH1	7.75	2.0	0.1	0.1	0.0	0.0	1.1	0.9	14.8	16.6	6	2	61	0
BH2	4.86	3.39	-3.8*	-2.5	0.0	0.0	0.5	0.5	19.5	19.5	0	0	8	8
BH3	2.53	7.47	0.0	0.0	0.0	0.0	1.5	1.5	16.6	16.6	0	0	0	0

*Steadily lowered to 2.5 over 3 minutes

Date: 09/11/2016

Atmospheric Pressure: 1000mb Steady

Weather: Overcast/cool

	Groundwater		Flow Rate		Gas Concentration (by volume)									
Borehole	Level	Groundwater	(1/	hr)	CH₄ (%)		CO ₂ (%)		O ₂ (%)		H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	21.0	21.0	0	0	0	0
BH1	7.31	2.44	0.2	0.1	0.0	0.0	2.3	1.4	14.6	17.3	6	0	16	0
BH2	4.16	4.09	5.9	5.3	0.1	0.0	3.7	3.3	10.1	11.0	0	0	5	0
BH3	2.51	7.49	0.1	0.0	0.0	0.0	2.0	1.9	16.1	16.4	0	0	0	0

Date: 18/11/2016

Atmospheric Pressure: 984mb Steady

Weather: Cloudy, cold, raining

	Groundwater		Flow	Rate	Gas Concentration (by volume)									
Borehole	Level	Groundwater	(1/	hr)	CH4 (%)		CO₂ (%)		O2 (%)		H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	20.9	20.9	0	0	0	0
BH1	6.60	3.15	0.1	0.1	0.0	0.0	1.7	1.7	13.5	13.5	0	0	0	0
BH2	1.30	6.95	0.7	0.2	0.0	0.0	1.3	1.3	16.2	16.3	0	0	0	0
BH3	2.38	7.62	0.2	0.2	0.0	0.0	2.2	2.2	17.6	17.8	0	0	0	0

Date: 24/11/2016 Atmospheric Pressure: 1028mb Steady

Weather: Sunny, cold, dry

	Groundwater		Flow Rate		Gas Concentration (by volume)										
Borehole	Level	Groundwater	(1/	(l/hr)		CH4 (%)		CO ₂ (%)		O ₂ (%)		H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady	
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	20.9	20.9	0	0	0	0	
BH1	7.30	2.45	0.2	0.2	0.1	0.0	3.1	3.1	8.3	8.3	0	0	0	0	
BH2	3.61	4.64	0.2	0.2	0.0	0.0	5.8	5.8	5.2	5.2	0	0	0	0	
BH3	2.39	7.61	0.0	0.0	0.0	0.0	2.5	2.5	17.5	17.7	0	0	0	0	




Moor Lane, Witton, Birmingham B6 7HG Telephone: +44(0)121 344 5885 Facsimile: +44(0)121 344 5888

FIGURE 1

Site Location Plan Scale 1:200,000 @A4



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Scale 1:2,500 @A4





Moor Lane, Witton, Birmingham B6 7HG Telephone: +44(0)121 344 5885 Facsimile: +44(0)121 344 5888

Scale 1:500 @A3

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FIGURE 5

Extract from BGS Sheet 28 Solid Edition; Scale 1:63,360





Project: E12964/1 Whitehaven

Date: 03/11/2016

Atmospheric Pressure: 1014mb Steady

Weather: Overcast/raining

	Groundwater		Flow	Rate	Gas Concentration (by volume)										
Borehole	Level	Groundwater	(1/	(l/hr)		CH₄ (%)		CO2 (%)		O ₂ (%)		H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady	
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	21.0	21.0	0	0	0	0	
BH1	7.75	2.0	0.1	0.1	0.0	0.0	1.1	0.9	14.8	16.6	6	2	61	0	
BH2	4.86	3.39	-3.8*	-2.5	0.0	0.0	0.5	0.5	19.5	19.5	0	0	8	8	
BH3	2.53	7.47	0.0	0.0	0.0	0.0	1.5	1.5	16.6	16.6	0	0	0	0	

*Steadily lowered to 2.5 over 3 minutes

Date: 09/11/2016

Atmospheric Pressure: 1000mb Steady

Weather: Overcast/cool

Groundwater Flow Rate						Gas Concentration (by volume)								
Borehole	Level	Groundwater	(1/	(l/hr)		CH4 (%)		CO ₂ (%)		(%)	H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	21.0	21.0	0	0	0	0
BH1	7.31	2.44	0.2	0.1	0.0	0.0	2.3	1.4	14.6	17.3	6	0	16	0
BH2	4.16	4.09	5.9	5.3	0.1	0.0	3.7	3.3	10.1	11.0	0	0	5	0
BH3	2.51	7.49	0.1	0.0	0.0	0.0	2.0	1.9	16.1	16.4	0	0	0	0

Date: 18/11/2016

Atmospheric Pressure: 984mb Steady

Weather: Cloudy, cold, raining

	Groundwater		Flow	Flow Rate G					Gas Concentration (by volume)							
Borehole	Level	Groundwater	(1/	hr)	CH4	CH₄ (%)		CO2 (%)		O2 (%)		H₂S (ppm)		CO (ppm)		
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady		
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	20.9	20.9	0	0	0	0		
BH1	6.60	3.15	0.1	0.1	0.0	0.0	1.7	1.7	13.5	13.5	0	0	0	0		
BH2	1.30	6.95	0.7	0.2	0.0	0.0	1.3	1.3	16.2	16.3	0	0	0	0		
BH3	2.38	7.62	0.2	0.2	0.0	0.0	2.2	2.2	17.6	17.8	0	0	0	0		

Date: 24/11/2016 Atmospheric Pressure: 1028mb Steady

Weather: Sunny, cold, dry

	Groundwater		Gas Concentration (by volume)												
Borehole	Level	Groundwater	(1/	(l/hr)		CH4 (%)		CO2 (%)		O ₂ (%)		H₂S (ppm)		CO (ppm)	
	(m bgl)	Level (mAOD)	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak	Steady	
Calibration	-	-	-	-	0.0	0.0	0.0	0.0	20.9	20.9	0	0	0	0	
BH1	7.30	2.45	0.2	0.2	0.1	0.0	3.1	3.1	8.3	8.3	0	0	0	0	
BH2	3.61	4.64	0.2	0.2	0.0	0.0	5.8	5.8	5.2	5.2	0	0	0	0	
BH3	2.39	7.61	0.0	0.0	0.0	0.0	2.5	2.5	17.5	17.7	0	0	0	0	

Enclosure A

Hydrology, Hydrogeology, Site Sensitivity and Flood Risk Maps

(13 Pages)



General



Site Sensitivity Map - Segment A13



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	A
Site Area (Ha):	0.34
Plot Buffer (m):	100

Site Details

1, the Ginns, Whitehaven, CA28 9DR



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Web

















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Site Sensitivity Map - Slice A



Order Details

Order Number:	
Customer Ref:	
National Grid Reference	С
Slice:	
Site Area (Ha):	
Search Buffer (m):	

98177302_1_1 E12964 ce: 297270, 517570 Α 0.34 1000

Site Details

1, the Ginns, Whitehaven, CA28 9DR



Tel: Fax: Web:



Industrial Land Use Map

General



8 Map ID

unica paner(

Specified Site Specified Buffer(s) X Bearing Reference Point

Industrial Land Use

- ★ Contemporary Trade Directory Entry
- 🛨 Fuel Station Entry
- 📉 Gas Pipeline
- 🔆 Points of Interest Commercial Services
- 🔆 Points of Interest Education and Health
- ★ Points of Interest Manufacturing and Production
- 🚖 Points of Interest Public Infrastructure
- 🜟 Points of Interest Recreational and Environmental
- V Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

Order Number:98177302_1_1Customer Ref:E12964National Grid Reference:297270, 517570Slice:ASite Area (Ha):0.34Search Buffer (m):1000

Site Details

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DTS RAEBURN DTECHNICAL & ENVIRONMENTAL

General

🔼 Specified Site

- C Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

Extreme Flooding from Rivers or Sea without Defences (Zone 2)

Flooding from Rivers or Sea without Defences (Zone 3)

Area Benefiting from Flood Defence



Flood Water Storage Areas

--- Flood Defence

Flood Map - Slice A



Order Details

Order Number: Customer Ref: National Grid Reference: 297270, 517570 Slice: Site Area (Ha): Search Buffer (m):

98177302_1_1 E12964 А 0.34 1000

Site Details

1, the Ginns, Whitehaven, CA28 9DR



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General

Specified Site
Specified Buffer(s)
Bearing Reference Point
Map ID
Several of Type at Location

Agency and Hydrological (Boreholes)

- 😑 BGS Borehole Depth 0 10m
- BGS Borehole Depth 10 30m
- 🔴 BGS Borehole Depth 30m +
- Confidential

⊖ Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A

Order Details

Order Number:98177302_1_1Customer Ref:E12964National Grid Reference:297270, 517570Slice:ASite Area (Ha):0.34Search Buffer (m):1000

Site Details

1, the Ginns, Whitehaven, CA28 9DR



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DTS RAEBURN FECHNICAL & ENVIRONMENTAL

General

- C Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID

Detailed River Network Data

Extended Culvert (greater than 50m) - Primary River Secondary River Underground River (inferred) - Tertiary River — Downstream of High Water Mark 🗕 Canal --- Downstream of Seaward Extension – – – Canal Tunnel --- Not assigned River feature Undefined River – – – Lake/Reservoir – – – Offline Drainage Feature Contours (height in metres) MLW Mean Low Water - 105 Standard Contour Master Contour

Spot Height



■MHAVI■ Mean High Water

EA/NRW Detailed River Network Map - Slice A



Order Details

Order Number: Customer Ref: National Grid Reference: 297270, 517570 Slice: Site Area (Ha): Search Buffer (m):

98177302_1_1 E12964 А 0.34 1000

Site Details

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Tel: Fax:

Web:

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General

- 🔼 Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Risk of Flooding from Surface Water

High - 30 Year Return
Medium - 100 Year Return

Low - 1000 Year Return

Suitability See the suitability map below

National to county County to town

Town to street

Street to parcels of land

Property

EA/NRW Suitability Map - Slice A



Order Details

Order Number: Customer Ref: National Grid Reference: 297270, 517570 Slice: А Site Area (Ha): Search Buffer (m): 0.34 1000

98177302_1_1 E12964

Site Details

1, the Ginns, Whitehaven, CA28 9DR



Tel: Fax: Web:

Enclosure B

Selected Historical Maps

(14 Pages)



Cumberland

Published 1840 - 1879

Source map scale - 1:500

The 1:500 scale Ordnance Survey mapping was introduced in 1855 as a replacement for the 1:528 scale and to compliment the 1:2500 scale that had been implemented in 1853. By 1895, the 1:500 scale covered most towns over a population of about 4000 at the time of survey, although very few towns were mapped more than once at this scale, and none have been since 1910. The 1:500 scale gives particular emphasis to such features as lamp posts, man holes, arched passages and minor building projections. Also often featured are divisions between tenements, interior ground floor layouts of public buildings, and on earlier plans, the functions of the various parts of larger industrial premises are also indicated. Content of the plans does vary however, from one town to the next in terms of, for example, the completeness of railway tracks and the coverage of public buildings.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13

A21 SE SW NE NW	A22	SE SW NE NW	A23	SE SW NE NW	A24	A25	
-A16	-A17		-A18-		-A19-	A20-	
SE SW NE NW		SE SW NE NW		SE SW NE NW		SE SW NE NW	N
-A11	-A12		– A) 3–		-A14-	A15-	
SE SW NE NW		SE SW NE NW		SE 6W NEINW		SE SW NE NW	\mathbf{V}
-·A6 – – –	- · Ą7		- · A <mark>'</mark> 8 - ·		– · Å9 – ·	A10-	
SE SW NE NW		SE SW NE NW		SE SW NE NW		SE SW NE NW	
A1	A2		A3		A4	A5	

Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	A
Site Area (Ha):	0.34
Search Buffer (m):	0

Site Details

1, the Ginns, Whitehaven, CA28 9DR



Tel: Fax: Web:





Cumberland

Published 1899

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	A
Site Area (Ha):	0.34
Search Buffer (m):	100
Site Area (Ha): Search Buffer (m):	0.34 100

Site Details

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Cumberland

Published 1925

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

)

Site Details

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Cumberland

Published 1938

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	A
Site Area (Ha):	0.34
Search Buffer (m):	100
Site Area (Ha): Search Buffer (m):	0.34 100

Site Details

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Ordnance Survey Plan

Published 1962

Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

 	— — — 1962 1:1,250	 	NX9 196 1:1,	9717 2 250	NW	 	NX9 196 1:1	9717 32 ,250	NE	
L İ		I	—	—	_	ł	-	—	_	
1	NX9617SE 1962 1:1,250	I	NX9 196 1:1	9717 2 250	SW	I	NX 196 1:1	9717 32 ,250	SE	

· _ _ _ I _ _ _ I _ _ _ I

Historical Map - Segment A13



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	Α
Site Area (Ha):	0.34
Search Buffer (m):	100

Site Details

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Ordnance Survey Plan Published 1975 - 1984 Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

 NX9617NE
 NX9717NW
 1975

 1984
 1975
 1:1,250

 1:1,250
 1:1,250
 1

 NX9617SE
 1

 1984
 1975
 1

 1984
 1975
 1

 1:1,250
 1
 1

 1:1,250
 1
 1

Historical Map - Segment A13



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	Α
Site Area (Ha):	0.34
Search Buffer (m):	100

Site Details

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DTS RAEBURN GEOTECHNICAL & ENVIRONMENTAL

Large-Scale National Grid Data Published 1994

Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

_						-
T T	NX9617NE 1994 1:1,250	1	NX9717NW 1994 1:1,250	l I	NX9717NE 1994 1:1,250	1
		I				
I	NX9617SE	I	NX9717SW	I	NX9717SE	I
L	1994 1:1,250	Т	1994 1:1,250	I.	1994 1:1,250	I
I.		Т		L		I

_ __ _ **Historical Map - Segment A13**



Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	A
Site Area (Ha):	0.34
Search Buffer (m):	100

Site Details

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Large-Scale National Grid Data Published 1996

Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

A21	A22	SE SW NE NW	A23	SE SW NE NW	A24	A25	
-A16	-A17		-A18		-A19-	A20-	
SE SW NE NW		SE SW NE NW		SE SW NE NW		SE SW NE NW	N A
-A11	-A12		(A)3-		-A14-	A15-	
SE SW NE NW		SE SW NEINW		SESW		SEISW NEINW	V
-•A6 – – –	- · A7		- • A <mark>8</mark>		- · A9 - ·	A10-	
SE SW NE NW	Å2	SE SW NE NW	A3	SE SW NE NW	Å4	sesw NeNW A5	

Order Details

Order Number:	98177302_1_1
Customer Ref:	E12964
National Grid Reference:	297270, 517570
Slice:	Α
Site Area (Ha):	0.34
Search Buffer (m):	100

Site Details

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Historical Aerial Photography Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13

A21	A22	A2:	3 SEISW NEINW	A24	A25	
-A16	-A17	A	3	-A19	A20 -	
SE SW NE NW		SW I	SE SW NE W		ie sw Ie NW	N A
-A11	-A12		3)	-A14	A15-	
SE SW NE NW	I si I Ni	SW I	SE SW NENW		SE SW TE NW	V
- · A6	- · A7	 A8		- · A9	A10-	
A1	A'2	sw NW A3	SEISW NEINW	A4	A5	

Order Details

Order Number:98177302_1_1Customer Ref:E12964National Grid Reference:297270, 517570Slice:ASite Area (Ha):0.34Search Buffer (m):100

Site Details

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DTS RAEBURN

10k Raster Mapping Published 2000

Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: Customer Ref: National Grid Reference: 297270, 517570 Slice: А Site Area (Ha): Search Buffer (m):

98177302_1_1 E12964 0.34 1000

Site Details

1, the Ginns, Whitehaven, CA28 9DR



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VectorMap Local

Published 2016

Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).



Enclosure C

Environmental Database

(53 Pages)



Envirocheck® Report:

Datasheet

Order Details:

Order Number: 98177302_1_1

Customer Reference: E12964

National Grid Reference: 297270, 517570

Slice:

Site Area (Ha): 0.34 Search Buffer (m):

1000

Site Details:

1, the Ginns Whitehaven CA28 9DR

Client Details:

Mr S Johnson DTS Raeburn Moor Lane Witton Birmingham West Midlands B6 7HG



Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	12
Hazardous Substances	17
Geological	18
Industrial Land Use	27
Sensitive Land Use	40
Data Currency	41
Data Suppliers	46
Useful Contacts	47

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				4
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls	pg 2		1		
Integrated Pollution Prevention And Control	pg 2		1		
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 2			2	2
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3		Yes		
Pollution Incidents to Controlled Waters	pg 3		2	3	11
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 6				3
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 6				2
Water Abstractions	pg 7				1
Water Industry Act Referrals					
Groundwater Vulnerability	pg 7	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 7	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 7	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 7		Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 9		Yes	n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Detailed River Network Lines	pg 9	Yes	Yes	Yes	n/a
Detailed River Network Offline Drainage					n/a

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 12				1
Licensed Waste Management Facilities (Locations)	pg 12			1	2
Local Authority Landfill Coverage	pg 12	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 12			2	1
Potentially Infilled Land (Non-Water)	pg 13		1	3	9
Potentially Infilled Land (Water)	pg 14		1	10	16
Registered Landfill Sites	pg 15				1
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 16		1	1	
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 17				1
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 18	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 18	Yes			Yes
BGS Recorded Mineral Sites	pg 18		9	7	23
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas	pg 25	Yes	n/a	n/a	n/a
Mining Instability	pg 25	Yes	n/a	n/a	n/a
Man-Made Mining Cavities	pg 25				1
Natural Cavities	pg 25				1
Non Coal Mining Areas of Great Britain	pg 25	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 25	Yes	Yes	n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 25	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 25	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 26	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 26	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 27		21	17	34
Fuel Station Entries	pg 33		1	2	1
Points of Interest - Commercial Services	pg 33		6	15	7
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 35		4	4	15
Points of Interest - Public Infrastructure	pg 37			9	8
Points of Interest - Recreational and Environmental	pg 39		4	2	
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 40				2
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves	pg 40				1
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest	pg 40				1
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (N)	0	2	297265 517600
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (S)	0	2	297265 517550
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Potential for Groundwater Flooding to Occur at Surface	A13NW (SW)	0	2	297265 517566
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Limited Potential for Groundwater Flooding to Occur	A13SW (W)	153	2	297100 517500
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Limited Potential for Groundwater Flooding to Occur	A13SW (W)	199	2	297050 517500
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Limited Potential for Groundwater Flooding to Occur	A13NW (W)	226	2	297000 517600
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (S)	276	2	297265 517250
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Limited Potential for Groundwater Flooding to Occur	A8NW (S)	326	2	297265 517200
	BGS Groundwater F	looding Susceptibility				
	Flooding Type:	Limited Potential for Groundwater Flooding to Occur	A18SW (NW)	489	2	297050 518050
	Discharge Consents	6				
1	Operator: Property Type: Location: Authority: Catchment Area: Reference: Permit Version:	United Utilities Water PIc (?) Sewerage Network - Sewers - Water Company Esk Avenue, Whitehaven, Copeland, Cumbria Environment Agency, North West Region Ehen 017480429 1	A14SW (SE)	606	3	297830 517250
	Effective Date: Issued Date: Revocation Date: Discharge Type:	7th March 2005 7th March 2005 Not Supplied				
	Discharge Environment:	Freshwater Stream/River				
	Receiving Water: Status:	Un-Named Trib Of Pow Beck Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995)				
	Positional Accuracy:	Located by supplier to within 10m				
	Discharge Consents	3				
2	Operator: Property Type: Location: Authority: Catchment Area: Reference: Permit Version:	United Utilities Water Limited Sewerage Network - Sewers - Water Company Esk Avenue, Whitehaven, Copeland, Cumbria Environment Agency, North West Region Ehen 01COP0041 1	A9NW (SE)	686	3	297880 517180
	Effective Date: Issued Date: Revocation Date: Discharge Type: Discharge Environment: Receiving Water	1st January 1995 1st January 1995 6th March 2005 Public Sewage: Storm Sewage Overflow Freshwater Stream/River				
	Status: Positional Accuracy:	Consent revoked or revised: New Consent issued (Section 37(1)) Located by supplier to within 100m				



Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	Discharge Consents Operator: Property Type: Location: Authority: Catchment Area: Reference: Permit Version: Effective Date: Issued Date: Revocation Date: Discharge Environment: Receiving Water: Status: Positional Accuracy:	North West Water Ltd Not Given North West W A , West Strand Outfall Environment Agency, North West Region Not Given COP0094 Not Supplied Not Supplied 1st April 1991 Not Supplied Storm Sewage Coastal Not Supplied Not Supplied Located by supplier to within 100m	A17SW (NW)	802	3	296500 517935
4	Discharge Consents Operator: Property Type: Location: Authority: Catchment Area: Reference: Permit Version: Effective Date:	Subscription of the second sec	A17SW (NW)	835	3	296520 518040
	Issued Date: Revocation Date: Discharge Type: Discharge Environment: Receiving Water: Status: Positional Accuracy:	Not Supplied 1st September 1996 Sewage Discharges - Unspecified - Water Company Unknown Unknown Outlet; Licence Status: Revoked Authorisation revokedRevoked Located by supplier to within 100m				
5	Integrated Pollution Name: Location: Authority: Permit Reference: Dated: Process Type: Description: Status: Positional Accuracy:	Controls Rhodia Consumer Specialties Ltd Po Box 15, Whitehaven, Cumbria, Ca28 9qq Environment Agency, North West Region Bt1134 Not Supplied IPC minor (non-substantial) variation to previous variation 4.2 A (J) Manufacture and use of Organic Chemicals within the Chemical Industry Application has met the requirements for authorisation (but not yet authorised)Not Yet Authorised Manually positioned within the geographical locality	A13SW (S)	223	3	297268 517303
6	Integrated Pollution Name: Location: Authority: Permit Reference: Original Permit Ref: Effective Date: Status: Application Type: Apps. Sub Type: Positional Accuracy: Activity Code: Activity Description: Primary Activity: Primary Activity:	Prevention And Control Npower Cogen Ltd Whitehaven Works, Po Box 15, Whitehaven, Cumbria, CA28 9QQ Environment Agency, North West Region Bu3680id 25th March 2004 Superseded By Variation Application New Manually positioned within the geographical locality 4.1 A(1) (A) (II) Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Y 0.0 Associated Process Associated Process N	A13NW (N)	204	3	297200 517800
7	Local Authority Poll Name: Location: Authority: Permit Reference: Dated: Process Type: Description: Status: Positional Accuracy:	ution Prevention and Controls Wm Morrison Plc Petrol Filling Station Flatt Walks, WHITEHAVEN, Cumbria, CA28 Copeland Borough Council, Environmental Health Department CBC/LAPPC/B/24 Not Supplied Local Authority Air Pollution Control PG1/14 Petrol filling station Authorised Manually positioned to the address or location	A13NE (NE)	358	4	297600 517780

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	Local Authority Poll Name: Location: Authority: Permit Reference: Dated: Process Type: Description: Status: Positional Accuracy:	ution Prevention and Controls Corkickle Service Station Back Corkickle, Whitehaven, Cumbria, CA28 7TS Copeland Borough Council, Environmental Health Department CBC/LAPPC/B/5 Not Supplied Local Authority Air Pollution Control PG1/14 Petrol filling station Authorised Manually positioned to the address or location	A14NW (E)	475	4	297783 517634
9	Local Authority Poll Name: Location: Authority: Permit Reference: Dated: Process Type: Description: Status: Positional Accuracy:	ution Prevention and Controls Lakeland Dry Cleaners 18 Church Street, Whitehaven, Ca28 7eb Copeland Borough Council, Environmental Health Department CBC/LAPPC/B27 Not Supplied Local Authority Pollution Prevention and Control PG6/46 Dry cleaning Permitted Manually positioned to the address or location	A18SE (N)	566	4	297362 518156
10	Local Authority Poll Name: Location: Authority: Permit Reference: Dated: Process Type: Description: Status: Positional Accuracy:	ution Prevention and Controls Tesco Petrol Filling Station Bransty Row, North Shore, Whitehaven, Cumbria, CA28 7XY Copeland Borough Council, Environmental Health Department CBC/LAPPC/B/25 Not Supplied Local Authority Air Pollution Control PG1/14 Petrol filling station Authorised Manually positioned to the address or location	A18NE (N)	990	4	297482 518563
	Nearest Surface Wa	ter Feature	A13NW	156	-	297088
11	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Oils - Unknown Pow Beck 27th November 1994 94120149 Irish Sea Coastal Not Given Other Incident/Unknown Category 3 - Minor Incident Located by supplier to within 100m	A13SE (SE)	185	3	297400 517400
12	Pollution Incidents f Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Ships/Boats Whitehaven Dock, Irish Sea Environment Agency, North West Region Oils - Other Fuel Oil Oil 8th October 1997 97120092 Irish Sea Coastal Coastal Water Deliberate Disposal To Drain Category 3 - Minor Incident Unknown	A13SE (S)	231	3	297300 517300
13	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Chemical industry Albright & Wilson Environment Agency, North West Region Chemicals - Detergents/Surfactant Foam On Sea 7th November 1998 NO980472 Irish Sea Coastal Coastal Water High Flow Category 3 - Minor Incident Located by supplier to within 100m	A13NE (NE)	300	3	297500 517800



Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Oils - Waste Oil Pow Beck 17th June 1994 94120065 Irish Sea Coastal Not Given Deliberate Disposal To Drain Category 3 - Minor Incident	A8NE (SE)	405	3	297500 517200
	Positional Accuracy:	Located by supplier to within 100m				
15	Pollution Incidents f Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Spillage; Accident In Transit Location Description Not Available Environment Agency, North West Region Chemicals - Acid Irish Sea; Phosphoric Acid 10th February 1993 93120014 Irish Sea Coastal Not Given Unknown Category 3 - Minor Incident Located by supplier to within 100m	A18SW (NW)	465	3	297000 518000
16	Pollution Incidents f Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Water Company Sewage: Storm Overflow Whitehaven A F C Environment Agency, North West Region Sewage - Storm Overflow Sewage 18th December 1998 NO980529 Irish Sea Coastal Freshwater Stream/River CSO Normal Operation Category 3 - Minor Incident Unknown	A14NW (NE)	540	3	297800 517800
17	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Spillage; Accident In Transit Location Description Not Available Environment Agency, North West Region Chemicals - Acid Phosphoric Acid 3rd November 1992 92120116 Irish Sea Coastal Not Given Unknown Category 3 - Minor Incident Located by supplier to within 100m	A8NE (S)	546	3	297400 517000
18	Pollution Incidents f Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Spillage; Accident In Transit Location Description Not Available Environment Agency, North West Region Miscellaneous - Foam Whitehaven Harbour 5th December 1991 91120126 Irish Sea Coastal Not Given Unknown Category 3 - Minor Incident Located by supplier to within 100m	A18SW (N)	601	3	297200 518200
19	Pollution Incidents f Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Spillage; Accident In Transit Location Description Not Available Environment Agency, North West Region Miscellaneous - Unknown Irish Sea Tributary 30th April 1991 91120034 Irish Sea Coastal Not Given Unknown Category 3 - Minor Incident Located by supplier to within 100m	A18NW (N)	700	3	297200 518300



Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Oils - Petrol Pow Beck 1st February 1995 95120013 Irish Sea Coastal Not Given	A18NE (N)	715	3	297400 518300
	Cause of Incident: Incident Severity: Positional Accuracy:	Other Incident/Unknown Category 3 - Minor Incident Located by supplier to within 100m				
21	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters No Premises Identified Whitehaven Harbour / Pow Beck, WHITEHAVEN HARBOUR, Cumbria Environment Agency, North West Region No Pollutant Not Supplied 5th August 1999 31015 Not Given Coastal Water Other Cause Category 3 - Minor Incident Located by supplier to within 100m	A18NW (N)	800	3	297200 518400
22	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Ships/Boats Whitehaven Harbour, WHITEHAVEN Environment Agency, North West Region Oils - Unknown Oil 30th January 1998 NO980033 Irish Sea Coastal Coastal Water Unknown Category 3 - Minor Incident Located by supplier to within 100m	A18NE (N)	813	3	297400 518400
23	Pollution Incidents of Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Industrial Effluent Not Supplied 5th August 1993 93120081 Irish Sea Coastal Not Given Unknown Category 2 - Significant Incident Located by supplier to within 100m	A7SE (SW)	857	3	296800 516800
24	Pollution Incidents i Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Oils - Waste Oil Pow Beck 7th February 1995 95120035 Irish Sea Coastal Not Given Leaking Underground Pipe Category 3 - Minor Incident Located by supplier to within 100m	A8SE (S)	895	3	297600 516700
25	Prollution Incidents (Property Type: Location: Authority: Pollutant: Note: Incident Date: Incident Date: Incident Reference: Catchment Area: Receiving Water: Cause of Incident: Incident Severity: Positional Accuracy:	to Controlled Waters Not Given Location Description Not Available Environment Agency, North West Region Chemicals - Detergents/Surfactant Not Supplied 12th October 1994 94120122 Irish Sea Coastal Not Given Other Incident/Unknown Category 3 - Minor Incident Located by supplier to within 100m	A12SW (W)	971	3	296300 517300

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Pollution Incidents	to Controlled Waters				
26	Property Type:	Connection To Surface Drains	A15SW	989	3	298300
	Location:	Cumbria	(E)			517500
	Pollutant:	Sewage Debris/Litter				
	Note:	Un Named Stream; Domestic Sewage				
	Incident Reference:	96120066				
	Catchment Area:	Irish Sea Coastal				
	Cause of Incident:	Wrong Connection				
	Incident Severity:	Category 3 - Minor Incident				
	Positional Accuracy:					
	Registered Radioac	tive Substances				
27	Name:	Centre For Environment Fisheries And Aquaculture Fisheries Radiobiological Laboratory, West Strand, WHITEHAVEN, Cumbria	A17NE	834	3	296845 518336
	Loodion	CA28 7LY	(1007)			010000
	Authority:	Environment Agency, North West Region				
	Dated:	25th July 1996				
	Process Type:	Registration under S7 RSA for the keeping and use of Radioactive materials				
	Description:	Minor variation to a registration under the Act of an open source which is also				
	Chatran	the subject of an authorisation				
	Status:	Authorisation superseded by a substantial or non substantial variationSuperseded				
	Positional Accuracy:	Automatically positioned to the address				
	Registered Radioac	tive Substances				
27	Name:	Centre For Environment Fisheries And Aquaculture	A17NE	839	3	296845
	Location:	Fisheries Radiobiological Laboratory, West Strand, WHITEHAVEN, Cumbria, CA28 7I Y	(NW)			518341
	Authority:	Environment Agency, North West Region				
	Permit Reference:	AK0936 6th October 1993				
	Process Type:	Registration under S7 RSA for the keeping and use of Radioactive materials				
	Description:	(was RSA60 S1) Registration under the Act of multiple open sources which are also the subject				
	Docomption	of authorisations				
	Status:	Authorisation superseded by a substantial or non substantial variationSuperseded				
	Positional Accuracy:	Automatically positioned to the address				
	Registered Radioac	tive Substances				
27	Name:	Centre For Environment Fisheries And Aquaculture	A17NE	846	3	296840
	Location:	The Cefas Whitehaven Laboratory, West Strand, WHITEHAVEN, Cumbria, CA28 7LY	(NVV)			518346
	Authority:	Environment Agency, North West Region				
	Permit Reference: Dated:	BB0698 7th May 1998				
	Process Type:	Registration under S7 RSA for the keeping and use of Radioactive materials				
	Description:	(was RSA60 S1) Minor variation to a registration under the Act of an open source which is also				
	-	the subject of an authorisation				
	Status: Positional Accuracy:	Authorisation either revoked or cancelledCancelled				
	Substantiated Pollur	tion Incident Perister				
28	Authority:	Environment Agency - North West Region North Area	A18NW	850	3	297105
	Incident Date:	30th October 2006	(N)		Ť	518439
	Incident Reference: Water Impact:	446969 Category 2 - Significant Incident				
	Air Impact:	Category 4 - No Impact				
	Land Impact: Positional Accuracy:	Category 4 - No Impact Located by supplier to within 10m				
	Pollutant:	Oils And Fuel: Mixed/Waste Oils				
	Substantiated Pollu	tion Incident Register				
29	Authority:	Environment Agency - North West Region, North Area	A18NE	918	3	297375
	Incident Date: Incident Reference:	445208	(N)			518511
	Water Impact:	Category 2 - Significant Incident				
	Air Impact: Land Impact:	Category 4 - No Impact Category 4 - No Impact				
	Positional Accuracy:	Located by supplier to within 10m				
	r ulutarit.					



Map ID	Details			Estimated Distance From Site	Contact	NGR
	Water Abstractions					
30	Operator:WhiteLicence Number:27740Permit Version:Not SLocation:InlandAuthority:EnvircAbstraction:ManulAbstraction Type:Not SSource:SurfactDaily Rate (m3):1Yearly Rate (m3):455	Phaven Brick & Tile Co Ltd 002003 upplied d Water At Fire Brick Works, WHITEHAVEN, Cumbria onment Agency, North West Region facturing upplied ce	A8SE (S)	827	3	297300 516700
	Details: Licence Authorised Start: Not S Authorised End: Not S Permit Start Date: Not S Permit End Date: Not S Positional Accuracy: Locate	ce Status: Revoked upplied upplied upplied upplied ed by supplier to within 100m				
	Groundwater Vulnerability Soil Classification: Soils workir worst Map Sheet: Sheet Scale: 1:100	f High Leaching Potential (U) - Soil information for restored mineral ngs and urban areas is based on fewer observations than elsewhere. A case vulnerability classification (H) assumed, until proved otherwise t 6 South West Cumbria ,000	A13NW (SW)	0	3	297265 517566
	Drift Deposits None					
	Bedrock Aquifer Designation: Secon	ions ndary Aquifer - A	A13NW (SW)	0	2	297265 517566
	Superficial Aquifer Design Aquifer Designation: Secor	nations ndary Aquifer - A	A13NW (SW)	0	2	297265 517566
	Superficial Aquifer Design Aquifer Designation: Secon	nations ndary Aquifer - Undifferentiated	A13SW (SW)	0	2	297250 517555
	Extreme Flooding from Rir Type: Exten Flood Plain Type: Fluvia Boundary Accuracy: As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al Models upplied	A13NE (NE)	3	3	297282 517588
	Extreme Flooding from RiType:ExtenFlood Plain Type:FluviaBoundary Accuracy:As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al / Tidal Events upplied	A13NW (N)	136	3	297218 517734
	Extreme Flooding from Ri Type: Exten Flood Plain Type: Fluvia Boundary Accuracy: As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al / Tidal Events upolied	A13SE (SE)	150	3	297353 517408
	Extreme Flooding from Ri Type: Exten Flood Plain Type: Fluvia Boundary Accuracy: As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al Models inplied	A13SE (SE)	153	3	297370 517417
	Extreme Flooding from Ri Type: Exten Flood Plain Type: Fluvia Boundary Accuracy: As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al Models and Fluvial / Tidal Events upplied	A13SE (SE)	153	3	297370 517417
	Extreme Flooding from RiType:ExtenFlood Plain Type:FluviaBoundary Accuracy:As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al Models and Fluvial / Tidal Events applied	A13SE (SE)	156	3	297380 517421
	Extreme Flooding from Ri Type: Exten Flood Plain Type: Fluvia Boundary Accuracy: As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences al Models upplied	A13SE (SE)	178	3	297468 517477
	Extreme Flooding from RiType:ExtenFlood Plain Type:Tidal IBoundary Accuracy:As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences Models upplied	A13NW (N)	189	3	297240 517790
	Extreme Flooding from RiType:ExtenFlood Plain Type:UndefBoundary Accuracy:As Su	vers or Sea without Defences t of Extreme Flooding from Rivers or Sea without Defences fined Events upplied	A13SE (SE)	196	3	297471 517450

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models and Undefined Events Boundary Accuracy: As Supplied	A13SE (SE)	196	3	297473 517452	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	A13SE (SE)	199	3	297479 517455	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	A13SE (SE)	201	3	297484 517459	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	A13SE (SE)	204	3	297488 517461	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13SE (SE)	206	3	297492 517463	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	A13SE (E)	211	3	297503 517472	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	A13SE (SE)	213	3	297481 517435	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial / Tidal Events Boundary Accuracy: As Supplied	A13SE (SE)	219	3	297468 517410	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13SE (SE)	220	3	297469 517409	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (N)	221	3	297166 517806	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A13NW (N)	224	3	297165 517810	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A13NW (N)	224	3	297165 517810	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Flovial Models Boundary Accuracy: As Supplied	A13NW (N)	225	3	297165 517811	
	Extreme Flooding from Rivers or Sea without Defences					
	Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial / Tidal Events Boundary Accuracy: As Supplied	A13SE (SE)	225	3	297473 517407	
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models	A13NW (NW)	225	3	297162 517810	
	Boundary Accuracy: As Supplied					
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models and Fluvial / Tidal Events Boundary Accuracy: As Supplied	A13NW (N)	226	3	297175 517815	
L	1					

Map ID	Details		Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	s or Sea without Defences	A13SE (SE)	226	3	297502 517442
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	s or Sea without Defences	A13NW (N)	227	3	297171 517815
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Fluvial Models and Undefined Events Boundary Accuracy: As Supplied	s or Sea without Defences	A13SE (SE)	230	3	297506 517439
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Undefined Events Boundary Accuracy: As Supplied	s or Sea without Defences	A13SE (SE)	236	3	297516 517444
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	s or Sea without Defences	A13SE (SE)	236	3	297523 517457
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	s or Sea without Defences	A13SE (SE)	247	3	297491 517394
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	without Defences	A13SE (SE)	153	3	297370 517417
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	without Defences	A13SE (SE)	170	3	297420 517433
	Areas Benefiting from Flood Defences None					
	Flood Water Storage Areas					
	Flood Defences None					
31	Detailed River Network Lines River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D012 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Currently Undefined Management Status: Pow Beck Name: Water Course Water Course POBE Reference: Vertice		A13NW (SW)	0	3	297264 517565
32	Detailed River Network LinesRiver Type:Extended Culvert (greater than 50m)River Name:Not SuppliedHydrographic Area:D012River Flow Type:Primary Flow PathRiver Surface Level:Below SurfaceDrain Feature:Not a DrainFlood RiskOther RiversManagement Status:Water CourseWater CourseNot SuppliedName:Water CourseWater CourseNot SuppliedReference:Not Supplied		A13NW (NW)	101	3	297186 517686

Agency & Hydrological

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	Detailed River Netw River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	ork Lines Extended Culvert (greater than 50m) Not Supplied D012 Primary Flow Path Below Surface Not a Drain Currently Undefined Pow Beck POBE	A13NW (NW)	101	3	297186 517686
	Detailed River Netw	ork Lines				
34	River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	Tertiary River Not Supplied D012 Primary Flow Path Surface Not a Drain Other Rivers Not Supplied Not Supplied	A13NW (NW)	156	3	297088 517668
35	Detailed River Netw River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	ork Lines Primary River Pow Beck D012 Primary Flow Path Surface Not a Drain Flood Risk Management Indicative/Statutory Main River Pow Beck POBE	A13SE (SE)	191	3	297380 517377
	Detailed River Netw	ork Lines				
36	River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	Tertiary River Not Supplied D012 Primary Flow Path Surface Not a Drain Other Rivers Not Supplied Not Supplied	A13NW (NW)	276	3	296972 517702
37	Detailed River Netw River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	ork Lines Tertiary River Not Supplied D012 Primary Flow Path Surface Not a Drain Other Rivers Not Supplied Not Supplied	A13NW (NW)	276	3	296972 517702
38	Detailed River Netw River Type: River Name: Hydrographic Area: River Flow Type: River Surface Level: Drain Feature: Flood Risk Management Status: Water Course Name: Water Course Reference:	ork Lines Primary River Not Supplied D012 Primary Flow Path Surface Not a Drain Flood Risk Management Indicative/Statutory Main River Midgey Gill MIDE	A14NW (E)	428	3	297715 517714

Order Number: 98177302_1_1 Date: 21-Sep-2016

rpr_ec_datasheet v50.0

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
39	Detailed River Network LinesRiver Type:Extended CulverRiver Name:Not SuppliedHydrographic Area:D012River Flow Type:Primary Flow ParRiver Surface Level:Below SurfaceDrain Feature:Not a DrainFlood RiskCurrently UndefinManagement Status:Water CourseWater CourseMidgey GillName:Water CourseWater CourseMIDEReference:Katen Status	: (greater than 50m) h ned	A14NW (E)	433	3	297715 517727
40	Detailed River Network Lines River Type: Primary River River Name: Not Supplied Hydrographic Area: D012 River Flow Type: Primary Flow Pair River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Flood Risk Mana Management Status: Water Course Water Course MIDE Reference: MIDE	h gement Indicative/Statutory Main River	A14NW (E)	435	3	297725 517705
41	River Type: Secondary River River Name: Not Supplied Hydrographic Area: D012 River Flow Type: Primary Flow Par River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Water Course Not Supplied Name: Water Course Water Course Not Supplied Reference: Not Supplied	h	A14NW (E)	435	3	297725 517705
42	Detailed River Network LinesRiver Type:Extended CulverRiver Name:Not SuppliedHydrographic Area:D012River Flow Type:Primary Flow PaiRiver Surface Level:Below SurfaceDrain Feature:Not a DrainFlood RiskFlood Risk ManaManagement Status:Water CourseWater CourseMidgey GillName:MIDEReference:Not a Drain	: (greater than 50m) h gement Indicative/Statutory Main River	A14NW (E)	443	3	297735 517701
43	Detailed River Network Lines River Type: Extended Culver River Name: Not Supplied Hydrographic Area: D012 River Flow Type: Primary Flow Pai River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Water Course Not Supplied Name: Water Course Detailed River Network Offline Drain	: (greater than 50m) h age	A14NW (E)	452	3	297741 517712
	None					

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Licensed Waste Ma	nagement Facilities (Landfill Boundaries)				
44	Name:	Woodhouse Quarry	A8SE	741	3	297325
	Licence Number:	57167	(S)			516788
	Location:	Woodhouse Quarry, Low Road, Whitehaven, Cumbria, CA28 9HS				
	Authority:	E012 Ll0 Environment Agency - North West Region North Area				
	Site Category:	Landfills Taking Non-biodegradeable Wastes (Not Construction)				
	Max Input Rate:	Not Supplied				
	Licence Status:	Expired				
	Positional Accuracy:	Positioned by the supplier				
	Boundary Accuracy:	As Supplied				
	Licensed Waste Ma	nagement Facilities (Locations)				
45	Licence Number:	57263	A13NW	302	3	297200
_	Location:	12/14 Albion Street, Whitehaven, Cumbria, CA28 9AD	(N)		-	517900
	Operator Name:	Hanratty Peter				
	Authority:	Not Supplied				
	Site Category:	Metal Recycling Sites (Mixed)				
	Licence Status:	Revoked				
	Issued:	1st June 1994 Net Supplied				
	Expires:	Not Supplied				
	Suspended:	Not Supplied				
	Revoked:	14th October 2014				
	Surrendered:	Not Supplied				
	Positional Accuracy:	Located by supplier to within 100m				
	Licensed Waste Ma	nagement Facilities (Locations)				
16	Licensed Waste Ma	57167	19510/	0.28	2	207200
40	Location:	Woodhouse Quarry, Low Road, Whitehaven, Cumbria, CA28 9HS	(S)	920	3	516600
	Operator Name:	Eotl2 Ltd	(0)			0.0000
	Operator Location:	Not Supplied				
	Authority:	Environment Agency - North West Region, North Area				
	Licence Status:	Expired				
	Issued:	13th January 1992				
	Last Modified:	Not Supplied				
	Expires: Suspended:	Not Supplied				
	Revoked:	Not Supplied				
	Surrendered:	Not Supplied				
	IPPC Reference:	Not Supplied				
47	Licensed Waste Ma	nagement Facilities (Locations)	40014/	004	2	007700
47	Licence Number:	57570 Unit 25 Meadow Road Whitebayen Cumbria CA28 9HX	A9SW (SE)	981	3	297700
	Operator Name:	Auto Spares And Repairs Limited	(02)			010000
	Operator Location:	Not Supplied				
	Authority:	Environment Agency - North West Region, North Area				
	Licence Status:	Revoked				
	Issued:	2nd April 2007				
	Last Modified:	Not Supplied				
	Expires: Suspended	Not Supplied				
	Revoked:	13th January 2009				
	Surrendered:	Not Supplied				
	IPPC Reference:	Not Supplied				
	Local Authority Lan	Idfill Coverage				007005
	Name:	- Has supplied landfill data		0	4	297265 517566
	Local Authority Lan	dfill Coverage				
	Name:	Cumbria County Council		0	5	297265
	Nume.	- Had landfill data but passed it to the relevant environment agency		Ŭ	0	517566
	Local Authority Rec	corded Landfill Sites				
48	Location:	Albion Street, Whitehaven	A13NW	298	4	297124
	Reference:	263	(NW)			517874
	Authority:	Copeland Borough Council, Environmental Health Department				
	Last Reported	UNKNOWN				
	Types of Waste:	Not Supplied				
	Date of Closure:	Not Supplied				
	Positional Accuracy:	Positioned by the supplier				
	Doundary Quality:	500u	1			

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Rec	corded Landfill Sites				
49	Location: Reference: Authority: Last Reported	Albion Street, Whitehaven 263 Copeland Borough Council, Environmental Health Department Unknown	A18SW (NW)	343	4	297118 517919
	Types of Waste: Date of Closure: Positional Accuracy: Boundary Quality:	Not Supplied Not Supplied Positioned by the supplier Good				
	Local Authority Rec	corded Landfill Sites				
50	Location: Reference: Authority: Last Reported Status: Types of Waste:	Woodhouse Quarry, Whitehaven 167 Copeland Borough Council, Environmental Health Department Unknown Not Supplied	A8SW (S)	857	4	297145 516676
	Date of Closure: Positional Accuracy: Boundary Quality:	Not Supplied Positioned by the supplier Good				
	Potentially Infilled L	and (Non-Water)				
51	Bearing Ref: Use: Date of Mapping:	S Unknown Filled Ground (Pit, quarry etc) 1979	A13SW (S)	250	-	297220 517279
	Potentially Infilled L	and (Non-Water)				
52	Bearing Ref: Use: Date of Mapping:	W Unknown Filled Ground (Pit, quarry etc) 1979	A12NE (W)	349	-	296878 517617
	Potentially Infilled L	and (Non-Water)				
53	Bearing Ref: Use: Date of Mapping:	SW Unknown Filled Ground (Pit, quarry etc) 1979	A8NW (SW)	360	-	297058 517224
	Potentially Infilled L	and (Non-Water)				
54	Bearing Ref: Use: Date of Mapping:	W Unknown Filled Ground (Pit, quarry etc) 1979	A12NE (W)	369	-	296856 517586
	Potentially Infilled L	and (Non-Water)				
55	Bearing Ref: Use: Date of Mapping:	S Unknown Filled Ground (Pit, quarry etc) 1979	A8NE (S)	520	-	297418 517032
	Potentially Infilled L	and (Non-Water)				
56	Bearing Ref: Use: Date of Mapping:	NW Unknown Filled Ground (Pit, quarry etc) 1979	A18SW (NW)	536	-	296983 518071
	Potentially Infilled L	and (Non-Water)				
57	Bearing Ref: Use: Date of Mapping:	S Unknown Filled Ground (Pit, quarry etc) 1979	A8NE (S)	612	-	297345 516921
58	Potentially Infilled L Bearing Ref: Use: Date of Mapping:	.and (Non-Water) S Unknown Filled Ground (Pit, quarry etc) 1979	A8SE (S)	712	-	297392 516827
	Potentially Infilled L	and (Non-Water)				
59	Bearing Ref: Use: Date of Mapping:	S Unknown Filled Ground (Pit, quarry etc) 1979	A8SE (S)	734	-	297464 516823
	Potentially Infilled L	and (Non-Water)				
60	Bearing Ref: Use: Date of Mapping:	SW Unknown Filled Ground (Pit, quarry etc) 1979	A7SE (SW)	898	-	296744 516788
	Potentially Infilled L	and (Non-Water)				
61	Bearing Ref: Use: Date of Mapping:	SE Unknown Filled Ground (Pit, quarry etc) 1979	A9NE (SE)	933	-	298130 517115
	Potentially Infilled L	and (Non-Water)				
62	Bearing Ref: Use: Date of Mapping:	SW Unknown Filled Ground (Pit, quarry etc) 1979	A7SW (SW)	968	-	296561 516850

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potentially Infilled La	and (Non-Water)				
63	Bearing Ref: Use: Date of Mapping:	S Unknown Filled Ground (Pit, quarry etc) 1979	A8SW (S)	979	-	297005 516579
	Potentially Infilled La	and (Water)				
64	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A13NW (W)	176	-	297049 517598
65	Potentially Infilled La Use: Date of Mapping:	and (Water) Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A13SW (W)	274	-	296985 517460
	Potentially Infilled La	and (Water)	. ,			
66	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1900	A13SW (W)	281	-	296949 517548
	Potentially Infilled La	and (Water)				
67	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A13NW (W)	288	-	296938 517604
	Potentially Infilled La	and (Water)				
68	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1900	A13NE (NE)	294	-	297553 517735
	Potentially Infilled La	and (Water)				
69	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1900	A13SW (W)	295	-	296960 517466
	Potentially Infilled La	and (Water)				
70	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A12SE (W)	307	-	296921 517562
	Potentially Infilled La	and (Water)				
71	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A12NE (W)	319	-	296914 517660
70	Potentially Infilled La	and (Water)				
12	Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	(SW)	350	-	296965 517331
73	Potentially Infilled La Use: Date of Mapping:	and (water) Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14NW	410	-	297723 517572
	Potentially Infilled La	and (Water)	(-)			
74	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14SW (E)	422	-	297733 517518
	Potentially Infilled La	and (Water)				
75	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A12SE (SW)	546	-	296763 517291
	Potentially Infilled La	and (Water)				
76	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14SW (E)	557	-	297829 517355
	Potentially Infilled La	and (Water)				
77	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1957	A12SE (SW)	560	-	296733 517324
	Potentially Infilled La	and (Water)				
78	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14SW (SE)	567	-	297782 517247
	Potentially Infilled La	and (Water)				
79	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1938	A12SE (SW)	584	-	296718 517297
	Potentially Infilled La	and (Water)				
80	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A12NE (W)	587	-	296653 517721
	Potentially Infilled La	and (Water)		0.00		007070
81	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14SW (SE)	618	-	297856 517270
	Potentially Infilled La	and (Water)	A 1705			0000.40
82	Use: Date of Mapping:	UTIKIIOWIT FIIIea Grouna (Pond, marsn, river, stream, dock etc) 1938	(NW)	668	-	296842 518141

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potentially Infilled L	and (Water)				
83	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14NE (E)	730	-	298025 517728
	Potentially Infilled L	and (Water)				
84	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A9NW (SE)	750	-	297862 517055
	Potentially Infilled L	and (Water)				
85	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1938	A14NE (E)	836	-	298128 517750
	Potentially Infilled L	and (Water)				
86	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A14SE (E)	864	-	298127 517275
	Potentially Infilled L	and (Water)				
87	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A9NE (SE)	895	-	298055 517065
	Potentially Infilled L	and (Water)				
88	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1900	A9SW (SE)	906	-	297632 516701
	Potentially Infilled L	and (Water)				
89	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1867	A18NW (N)	950	-	297245 518551
	Potentially Infilled L	and (Water)				
90	Use: Date of Mapping:	Unknown Filled Ground (Pond, marsh, river, stream, dock etc) 1938	A19NW (NE)	975	-	297772 518425
	Registered Landfill	Sites				
	Site Location: Licence Easting: Licence Easting: Licence Northing: Operator Location: Authority: Site Category: Max Input Rate: Waste Source Restrictions: Status: Dated: Preceded By Licence: Superseded By Licence: Positional Accuracy: Boundary Accuracy: Authorised Waste	Not Given Manually positioned to the address or location Not Given Manually positioned to the address or location Not Applicable H'Concrete,Brick,Slate,Glass,Cera Inert Mat'L Consisting Of Max.Waste Permitted By Licence				516600
	Prohibited Waste	Soil, Sand, Clay, Stone Animal Flesh Clinical - As In Coll/Disp.Regs Of '88 Difficult Wastes As In Doe Wmp No.26 Foodstuffs Hard Bonded Asbestos From Constr/Demol Leachate Forming Mat'Ls Incl. Liquid Wastes Metal Objects Paper/Cardboard Waste Plaster Objects Plastic Objects Sawdust Spec.Waste (Epa'90:S62/1996 Regs) Textiles Vegetable Matter Waste In Demountable Containers Wood/Timber				

Map ID	Details			Estimated Distance From Site	Contact	NGR
	Registered Waste T	reatment or Disposal Sites				
92	Licence Holder: Licence Reference: Site Location: Operator Location: Authority: Site Category: Max Input Rate: Waste Source Restrictions: Licence Status: Dated: Preceded By Licence: Superseded By Licence: Positional Accuracy: Boundary Quality: Authorised Waste	Partco Autoparts Ltd 203/M1 Border Yard, Coach Road, WHITEHAVEN, Cumbria, CA28 9DF Lea Francis House, Station Road, Balsall Common, COVENTRY, West Midlands, CV7 7FD Environment Agency - North West Region, North Area Storage - with transfer Very Large (Equal to or greater than 250,000 tonnes per year) No known restriction on source of waste Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled 1st September 1992 Not Given Not Given Manually positioned to the road within the address or location Not Supplied Alcohols Aldehydes And Ketones Aliphatic Hydrocarbons Ethers Liq.Waste Cellulose Paint/Thinner Cont Max.Storage	A13SE (SE)	185	3	297400 517400
	Registered Waste T					
93	Licence Holder: Licence Reference: Site Location: Operator Location: Authority: Site Category: Max Input Rate: Waste Source Restrictions: Licence Status: Dated: Preceded By Licence: Superseded By Licence: Positional Accuracy: Boundary Quality: Authorised Waste	P Hanratty 263/M1 Albion Street, WHITEHAVEN, Cumbria, CA28 9AD As Site Address Environment Agency - North West Region, North Area Scrapyard Very Small (Less than 10,000 tonnes per year) No known restriction on source of waste Operational as far as is knownOperational 1st June 1994 Not Given Not Given Manually positioned to the road within the address or location Not Supplied Domestic Appliances Ferrous Metal Scrap Industrial Scrap Metal/Machinery Max.Waste Permitted By Licence Non-Ferrous Metal Scrap Scrap Vehicles Clinical - As In Coll/Disp.Regs Of '88 Commercial Waste Construction And Demolition Wastes Difficult Wastes (As In Wmp.26) Drums/Cont'Rs Which Contain Waste Industrial Wastes Liquid Wastes Non-Metal Waste Percussive/Explosive/Similar Waste Spec.Waste (Epa'90:S62/1996 Regs)N.O.S Waste N.O.S.	A18SW (N)	333	3	297150 517920



Hazardous Substances

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Control of Major Accident Hazards Sites (COMAH)					
94	Name: Location:	Rhodia Consumer Specialties Limited Whitehaven Works, P O Box 15, High Street, WHITEHAVEN, Cumbria, CA28 9QQ	A19NW (NE)	910	6	297656 518415
	Reference: Type: Status: Positional Accuracy:	Not Supplied Upper Tier Record Ceased To Be Supplied Under COMAH Regulations Manually positioned to the road within the address or location				



Map ID		Details		Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solie	d Geology				
	Description:	Pennine Middle Coal Measures Formation And South Wales Middle Coal Measures Formation (Undifferentiated)	A13NW (SW)	0	2	297265 517566
	BGS Estimated Soil	Chemistry				
	Source: Soil Sample Type: Arsenic Concentration:	British Geological Survey, National Geoscience Information Service Sediment <15 mg/kg	A13NW (SW)	0	2	297265 517566
	Cadmium Concentration:	<1.8 mg/kg				
	Concentration: Lead Concentration:	<100 mg/kg				
	Concentration:	is - su mg/kg				
	BGS Estimated Soil	l Chemistry				
	Source: Soil Sample Type: Arsenic Concentration:	British Geological Survey, National Geoscience Information Service Sediment no data	A18NW (N)	787	2	297189 518386
	Cadmium Concentration: Chromium	<1.8 mg/kg				
	Concentration: Lead Concentration: Nickel	<100 mg/kg				
	Concentration:					
	BGS Recorded Mine	eral Sites				
95	Site Name: Location: Source: Reference: Type: Status: Operator:	Harris Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225752 Underground Ceased Not Supplied	A13SW (S)	60	2	297229 517472
	Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m				
	BGS Recorded Mine	eral Sites				
96	Site Name: Location: Source: Reference: Type: Status:	New Ginn Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225763 Underground Ceased	A13SW (S)	123	2	297265 517403
	Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m				
	BGS Recorded Mine	eral Sites				
97	Site Name: Location: Source: Reference: Type: Status: Operator:	Pedler Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225725 Underground Ceased Not Supplied	A13NW (NW)	127	2	297135 517682
	Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Not Supplied Carboniferous Pennine Coal Measures Group Coal - Deep Located by supplier to within 10m				



Map ID		Details		Estimated Distance From Site	Contact	NGR
	BGS Recorded Mine	eral Sites				
98	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Stowe Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225762 Underground Ceased Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A13SE (S)	183	2	297306 517350
	BGS Recorded Mine	eral Sites				
99	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Periodic Type: Geology: Commodity: Positional Accuracy:	Parker Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225759 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A13SW (W)	190	2	297044 517538
	BGS Recorded Mine	eral Sites				
100	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Destitute Locations	Engine Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225753 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by cumplicate within 10m	A13SW (S)	200	2	297247 517326
101	BGS Recorded Mine Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Year Sites Whitehaven , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 140707 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Sandstone Located by supplier to within 10m	A13NW (NW)	209	2	297073 517736
	BGS Recorded Mine	eral Sites				
101	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Newtown Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225724 Underground Ceased Not Supplied Not Supplied Carboniferous Main Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A13NW (NW)	222	2	297100 517777
	BGS Recorded Mine	eral Sites			_	
102	site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Ciay Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225755 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by supplier to within 10m	A13SW (S)	242	2	297192 517292



Map ID		Details			Contact	NGR
	BGS Recorded Mine	eral Sites				
103	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Periodic Type: Geology: Commodity: Positional Accuracy:	Ginns Drift , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225754 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A13SE (S)	254	2	297326 517282
	BGS Recorded Mine	eral Sites				
104	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Burnt Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225757 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A8NE (S)	358	2	297284 517169
	BGS Recorded Mine	eral Sites				
105	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Radcliffe Band Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225764 Underground Ceased Not Supplied Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A8NW (S)	362	2	297116 517192
	BGS Recorded Mine	ral Sites				
105	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Swinburn Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225765 Underground Ceased Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A8NW (S)	401	2	297100 517156
	BGS Recorded Mine	eral Sites				
106	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Arrowthwaite Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225756 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A8NW (SW)	371	2	297053 517214
40-	BGS Recorded Mine	eral Sites	A 4005		~	000040
107	Inte Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	I nwaite Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225720 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Coal Measures Group Coal - Deep Located by supplier to within 10m	A12SE (W)	416	2	296813 517542



Map ID		Details			Contact	NGR
	BGS Recorded Mine	aral Sites				
108	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Deriodic Type: Geology: Commodity: Positional Accuracy:	Double Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225758 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A8NW (S)	432	2	297127 517113
	BGS Recorded Mine	eral Sites				
109	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Periodic Type: Geology: Commodity: Positional Accuracy:	Duke Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225723 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A18SW (NW)	539	2	296971 518068
	BGS Recorded Mine	eral Sites				
110	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Haig Colliery , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 11792 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A12NE (W)	542	2	296684 517616
	BGS Recorded Mine	aral Sites				
110	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Haig Colliery , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225721 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A12NE (W)	545	2	296681 517568
	BGS Recorded Mine	eral Sites				
111	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Operator: Operator: Periodic Type: Geology: Commodity: Positional Accuracy:	King Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225722 Underground Ceased Not Supplied Not Supplied Carboniferous Main Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A12NE (NW)	632	2	296667 517889
	BGS Recorded Mine	aral Sites		074	~	000000
111	site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Ravenniii , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 8556 Opencast Ceased Not Supplied Not Supplied Carboniferous Whitehaven Sandstone Formation Sandstone Located by supplier to within 10m	A12NE (NW)	674	2	296620 517890



Map ID	Details			Estimated Distance From Site	Contact	NGR
	BGS Recorded Mine	ral Sites				
112	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location:	Kell Bearmouth , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225770 Underground Ceased Not Supplied Not Supplied	A8NE (S)	652	2	297465 516909
	Periodic Type: Geology: Commodity: Positional Accuracy:	Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m				
	BCS Beeerded Mine					
113	Site Name: Location: Source: Reference: Type: Status:	Fox Pit , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225771 Underground Ceased	A8SE (S)	652	2	297349 516881
	Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m				
	PCS Decorded Mine					
114	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Howgill Head Clay Pits , Kells, Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 16706 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by Supplier to within 10m	A8SE (S)	683	2	297310 516845
	BCS Beeerded Mine					
115	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Howgill Pit , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225772 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A8SE (S)	727	2	297381 516810
	BGS Recorded Mine	ral Sites				
116	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Raven Hill Pit , Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225750 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A12SW (W)	729	2	296533 517366
447	BGS Recorded Mine	In a stres	4005	750	0	007000
117	site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Howgill Head Clay Pits , Kells, Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 16705 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by supplier to within 10m	A8SE (S)	750	2	297333 516780

Map ID		Details			Contact	NGR
118	BGS Recorded Mine Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Paral Sites Howgill Head Clay Pits , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225773 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by supplier to within 10m	A8SE (S)	796	2	297271 516730
	BGS Recorded Mine					
119	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Wood Houses Brick Field Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225760 Opencast Ceased Not Supplied Not Supplied Quaternary, Devensian Till, Devensian Common Clay and Shale Located by supplier to within 10m	A8SE (S)	800	2	297438 516747
	BGS Recorded Mine	eral Sites				
120	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Saltom Pit , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 11793 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Coal Measures Group Coal - Deep Located by supplier to within 10m	A12SW (W)	821	2	296434 517377
	BGS Recorded Mine	eral Sites				
121	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator: Periodic Type: Geology: Commodity: Positional Accuracy:	Howgill Head Clay Pits , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225774 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by supplier to within 10m	A8SW (S)	828	2	297168 516703
	BGS Recorded Mine	eral Sites				
122	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Rise Pit , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225769 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Coal - Deep Located by supplier to within 10m	A8SE (S)	850	2	297388 516687
122	BGS Recorded Mine	eral Sites		855	2	206725
123	Compositional Accuracy:	Weinington Fit , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 224563 Underground Ceased Not Supplied Not Supplied Carboniferous Pennine Coal Measures Group Coal - Deep Located by supplier to within 10m	(NW)	000	2	290729 518287



Map ID		Details			Contact	NGR
104	BGS Recorded Mine	eral Sites Senhouse Rise Rit	ARCE	963	2	207200
124	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Sennouse Rise Pit , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225766 Underground Ceased Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m	(S)	863	2	297289 516664
	BGS Recorded Mine	eral Sites				
124	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Bell Pit , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225767 Underground Ceased Not Supplied Not Supplied Carboniferous Bannock Coal (Cumbria) Coal - Deep Located by supplier to within 10m	A8SE (S)	891	2	297319 516637
	BGS Recorded Mine	eral Sites				
125	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Postitional Accuracy:	Harras Park , Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 140705 Opencast Ceased Not Supplied Not Supplied Carboniferous Whitehaven Sandstone Formation Sandstone Located by supplier to within 10m	A19NW (NE)	928	2	297928 518260
	BGS Recorded Mine	and Sites				
126	Site Name: Location: Source: Reference: Type: Status: Operator: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Kells, Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 140708 Opencast Ceased Not Supplied Not Supplied Carboniferous Whitehaven Sandstone Formation Sandstone Located by supplier to within 10m	A7SE (SW)	931	2	296692 516784
	BGS Recorded Mine	eral Sites				
127	Site Name: Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	Howgill Head Clay Pits , Woodhouse, Whitehaven, Cumberland British Geological Survey, National Geoscience Information Service 225775 Opencast Ceased Not Supplied Not Supplied Carboniferous Pennine Middle Coal Measures Formation Common Clay and Shale Located by supplier to within 10m	A8SW (S)	949	2	297168 516581
128	BGS Recorded Mine Site Name:	erai sites Brake House	A8SW	979	2	296999
	Location: Source: Reference: Type: Status: Operator: Operator Location: Periodic Type: Geology: Commodity: Positional Accuracy:	, Whitehaven, Cumbria British Geological Survey, National Geoscience Information Service 140709 Opencast Ceased Not Supplied Not Supplied Carboniferous Whitehaven Sandstone Formation Sandstone Located by supplier to within 10m	(S)			516581



Map ID		Details		Estimated Distance From Site	Contact	NGR
	BGS Measured Urba No data available	an Soil Chemistry				
	BGS Urban Soil Che	emistry Averages				
	No data available	·······				
	Coal Mining Affecte	d 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.	A13NW (SW)	0	7	297265 517566
	Mining Instability					
	Mining Evidence:	Inconclusive Coal Mining	A13NW	0	-	297265
	Source: Boundary Quality:	Ove Arup & Partners As Supplied	(SW)			517566
	Man-Made Mining C	avities				
	Easting:	296700	A12NE	526	8	296700
	Distance:	526	(VV)			517600
	Quadrant Reference:	A12				
	Bearing Ref:	W				
	Cavity Type:	Unknown				
	Solid Geology Detail:	No Details				
	Superficial Geology Detail:	No Details				
	Natural Cavities					
	Easting:	296500	A17SW	832	8	296500
	Northing:	518000	(NW)			518000
	Quadrant Reference:	A17				
	Quadrant Reference: Rearing Ref	SW NW				
	Cavity Type:	Gulls/Fissures due to Cambering				
	Solid Geology Detail: Superficial Geology	Whitehaven Sandstone Formation No Details				
	Detail:					
	Non Coal Mining Ar	eas of Great Britain				
	Risk: Source:	Highly Unlikely British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	2	297265 517566
	Potential for Collaps	sible Ground Stability Hazards				
	Hazard Potential:	No Hazard	A13NW	0	2	297265
	Source:	British Geological Survey, National Geoscience Information Service	(SW)			517566
	Potential for Collaps	sible Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13SW (SW)	0	2	297250 517555
	Potential for Collaps	sible Ground Stability Hazards	(-)			
	Hazard Potential:	Very Low	A13SE	197	2	297510
	Source:	British Geological Survey, National Geoscience Information Service	(E)	-		517564
	Potential for Compr	essible Ground Stability Hazards				
	Hazard Potential:	No Hazard British Geological Survey, National Geoscience Information Service	A13SW	0	2	297250
	Botantial for Comm		(311)			517555
	Hazard Potential	Moderate		0	2	207265
	Source:	British Geological Survey, National Geoscience Information Service	(SW)	U	2	517566
	Potential for Ground	Dissolution Stability Hazards				
	Hazard Potential:	No Hazard	A13NW	0	2	297265
	Source:	Driven Geological Survey, National Geoscience Information Service	(SVV)			517566
	Hazard Potontial		A12CM/	0	2	207215
	Source:	British Geological Survey, National Geoscience Information Service	(SW)	0	۷	517549
	Potential for Landsl	ide Ground Stability Hazards				
	Hazard Potential:	Very Low	A13NW	0	2	297265
	Source:	Dillish Geological Survey, National Geoscience Information Service	(SVV)			517566
	Potential for Lands	Ide Ground Stability Hazards	A 1 2 NIM	40	0	207475
	Source:	British Geological Survey, National Geoscience Information Service	(W)	49	2	517585

Map ID	Details			Estimated Distance From Site	Contact	NGR
	Potential for Lands	lide Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13NW (W)	164	2	297063 517571
	Potential for Lands	lide Ground Stability Hazards				
	Hazard Potential: Source:	Low British Geological Survey, National Geoscience Information Service	A13SW (W)	189	2	297057 517482
	Potential for Runnin	ng Sand Ground Stability Hazards				
	Hazard Potential: Source:	No Hazard British Geological Survey, National Geoscience Information Service	A13SW (W)	0	2	297245 517561
	Potential for Runni	ng Sand Ground Stability Hazards				
	Hazard Potential: Source:	Low British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	2	297265 517566
	Potential for Runnin	ng Sand Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13SW (SW)	0	2	297250 517555
	Potential for Runnii	ng Sand Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13SE (E)	197	2	297510 517564
	Potential for Runni	ng Sand Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13SW (W)	231	2	297025 517476
	Potential for Shrink	ing or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Source:	Very Low British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	2	297265 517566
	Potential for Shrink	ing or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Source:	No Hazard British Geological Survey, National Geoscience Information Service	A13SW (S)	98	2	297258 517428
	Potential for Shrink	ing or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Source:	No Hazard British Geological Survey, National Geoscience Information Service	A13NW (W)	164	2	297063 517571
	Potential for Shrink	ing or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Source:	Low British Geological Survey, National Geoscience Information Service	A13SE (E)	197	2	297510 517564
	Potential for Shrink	ing or Swelling Clay Ground Stability Hazards				
	Hazard Potential: Source:	No Hazard British Geological Survey, National Geoscience Information Service	A13NW (W)	220	2	297005 517580
	Radon Potential - R	adon Affected Areas				
	Affected Area: Source:	The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). British Geological Survey. National Geoscience Information Service	A13NW (SW)	0	2	297265 517566
	Radon Potential - R	adon Protection Measures				
	Protection Measure:	No radon protective measures are necessary in the construction of new dwellings or extensions	A13NW (SW)	0	2	297265 517566
	Source:	British Geological Survey, National Geoscience Information Service				

Industrial Land Use

Map ID		Details			Contact	NGR
	Contemporary Trad	e Directory Entries				
129	Name: Location: Classification: Status: Positional Accuracy:	Kwik-Fit Preston St, Whitehaven, Cumbria, CA28 9DL Tyre Dealers Inactive Manually positioned to the road within the address or location	A13SW (SW)	8	-	297244 517532
	Contemporary Trad	e Directory Entries				
130	Name: Location: Classification: Status: Positional Accuracy:	J Mossop 2a Preston St, Whitehaven, Cumbria, CA28 9DL Blacksmiths & Forgemasters Inactive Manually positioned to the road within the address or location	A13NW (NW)	41	-	297208 517630
	Contemporary Trad	e Directory Entries				
130	Name: Location: Classification: Status: Positional Accuracy:	Preston Street Garage Preston Street, Whitehaven, Cumbria, CA28 9DL Garage Services Inactive Automatically positioned to the address	A13NW (NW)	65	-	297183 517642
	Contemporary Trad	e Directory Entries				
131	Name: Location: Classification: Status: Positional Accuracy:	Jewson Timber Yard, Coach Road, Whitehaven, Cumbria, CA28 7TB Builders' Merchants Active Automatically positioned to the address	A13SE (E)	138	-	297436 517503
	Contemporary Trad	e Directory Entries				
132	Name: Location: Classification: Status: Positional Accuracy:	Topz Pets Coach Road, Whitehaven, Cumbria, CA28 9DB Pet Foods & Animal Feeds Inactive	A13SE (SE)	146	-	297368 517424
133	Name: Location: Classification: Status: Positional Accuracy:	Jacksons Marine Border House, Coach Road, Whitehaven, Cumbria, CA28 9DF Boatbuilders & Repairers Inactive Automatically positioned to the address	A13SE (SE)	161	-	297422 517447
	Contemporary Trad	e Directory Entries				
133	Name: Location: Classification: Status: Positional Accuracy:	Coachroad Garage Coach Rd, Whitehaven, Cumbria, CA28 9DF Garage Services Inactive Manually positioned to the road within the address or location	A13SE (SE)	192	-	297420 517406
	Contemporary Trad	e Directory Entries				
134	Name: Location: Classification: Status: Positional Accuracy:	Exhaust Craft 1, Monkwray Lodge, Low Monkwray, Whitehaven, Cumbria, CA28 9DS Exhaust System Manufacturers & Wholesalers Active Manually positioned to the address or location	A13SW (S)	175	-	297239 517352
135	Contemporary Trad	e Directory Entries Coach Road Motorworks	A13SE	180		297366
	Location: Classification: Status: Positional Accuracy:	The Rise, Coach Rd/, Whitehaven, Cumbria, CA28 9BX Garage Services Inactive Manually positioned to the road within the address or location	(SE)			517380
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Sel Wholesale Pottery Mews, The Rise, Coach Road, Whitehaven, Cumbria, CA28 9BX Electrical Goods Sales, Manufacturers & Wholesalers Inactive Manually positioned within the geographical locality	A13SE (SE)	185	-	297353 517367
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskill Unit 2, Pottery Road, Whitehaven, CA28 9BZ Garage Services Active Automatically positioned to the address	A13SE (SE)	218	-	297377 517342
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskill Unit 2, Pottery Road, Whitehaven, CA28 9BZ Garage Services Inactive Automatically positioned to the address	A13SE (SE)	218	-	297377 517342
Map ID		Details			Contact	NGR
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	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskilltyres.Co.Uk Unit 1, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Tyre Dealers Inactive Automatically positioned to the address	A13SE (SE)	225	-	297377 517334
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Cumbria Car Parts Unit 1, Whitehaven, Cumbria, ca28 9jx Tyre Dealers Inactive Manually positioned within the geographical locality	A13SE (S)	226	-	297336 517315
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskill Tyres Unit 1, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Tyre Dealers Inactive Automatically positioned to the address	A13SE (SE)	226	-	297377 517334
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskill Tyres Unit 1, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Tyre Dealers Inactive Automatically positioned to the address	A13SE (SE)	226	-	297377 517334
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Camskill Tyres Unit 1, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Tyre Dealers Inactive Automatically positioned to the address	A13SE (SE)	226	-	297377 517334
	Contemporary Trad					
135	Name: Location: Classification: Status: Positional Accuracy:	Camskilltyres.Co.Uk Unit 1, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Tyre Dealers Inactive Automatically positioned to the address	A13SE (SE)	226	-	297377 517334
	Contemporary Trad	e Directory Entries				
135	Name: Location: Classification: Status: Positional Accuracy:	Pottery Bodyworks Unit 3, Pottery Road, Whitehaven, Cumbria, CA28 9BZ Car Body Repairs Inactive Automatically positioned to the address	A13SE (S)	252	-	297373 517302
	Contemporary Trad	e Directory Entries				
136	Name: Location: Classification: Status: Positional Accuracy:	Top Yard Building Supplies Ltd Pottery Yard, The Ginns, Whitehaven, Cumbria, CA28 9DA Builders' Merchants Active Automatically positioned to the address	A13SE (S)	211	-	297280 517317
	Contemporary Trad	e Directory Entries				
137	Name: Location: Classification: Status: Positional Accuracy:	Kwik Fit Newtown, Whitehaven, Cumbria, CA28 7HX Tyre Dealers Active Automatically positioned to the address	A13NW (NW)	223	-	297128 517794
	Contemporary Trad	e Directory Entries				
138	Name: Location: Classification: Status: Positional Accuracy:	Neil Vaughan Border Yard,Coach Rd, Whitehaven, Cumbria, CA28 9DF Garage Services Inactive Manually positioned to the road within the address or location	A13SE (E)	233	-	297526 517470
	Contemporary Trad	e Directory Entries				
139	Name: Location: Classification: Status: Positional Accuracy:	G J Autos Ltd Atlas Engineering Works, Newtown, Whitehaven, Cumbria, CA28 7HX Mot Testing Centres Inactive Automatically positioned to the address	A13NW (N)	300	-	297146 517883
	Contemporary Trad	e Directory Entries				
140	Name: Location: Classification: Status: Positional Accuracy:	Studholme Dickson & Co Ltd Castle Garage,Irish St, Whitehaven, Cumbria, CA28 7BU Garage Services Inactive Manually positioned to the road within the address or location	A18SE (N)	318	-	297292 517916
		manadily people indicate the road mann the address of location	1	1	1	

Map ID		Details			Contact	NGR
	Contemporary Trad	e Directory Entries				
141	Name: Location: Classification: Status: Positional Accuracy:	T Lewthwaite Lewthwaite, Flatt Walks, Whitehaven, Cumbria, CA28 7RW Engine Rebuilding & Reconditioning Inactive Automatically positioned to the address	A14NW (E)	322	-	297623 517655
	Contemporary Trad	e Directory Entries				
141	Name: Location: Classification: Status: Positional Accuracy:	Stephenson Auto Body Repairs Unit 1, Rope Walk, Coach Road, Whitehaven, Cumbria, CA28 7TE Car Body Repairs Inactive Automatically positioned to the address	A14NW (E)	360	-	297665 517643
	Contemporary Trad	e Directory Entries				
142	Name: Location: Classification: Status: Positional Accuracy:	Norman Strickland Flatt Walks, Whitehaven, Cumbria, CA28 7RW Garage Services Inactive Automatically positioned in the proximity of the address	A14NW (E)	386	-	297679 517689
	Contemporary Trad	e Directory Entries				
143	Name: Location: Classification: Status: Positional Accuracy:	W M Morrisons Petrol Station Flatt Walks, Whitehaven, Cumbria, CA28 7RW Petrol Filling Stations Active Automatically positioned to the address	A18SE (NE)	419	-	297558 517905
	Contemporary Trad	e Directory Entries				
144	Name: Location: Classification: Status: Positional Accuracy:	Homestyle By Fads Swingpump Lane, Whitehaven, Cumbria, CA28 7LZ Wallpapers & Wall Coverings Inactive	A18SW (N)	431	-	297123 518014
	Contomporary Trad					
144	Name: Location: Classification: Status: Positional Accuracy:	Mountains From Molehills 19, Lonsdale Centre, Swingpump Lane, WHITEHAVEN, Cumbria, CA28 7LZ Printers Inactive Automatically positioned to the address	A18SW (N)	431	-	297123 518014
	Contemporary Trad	e Directory Entries				
145	Name: Location: Classification: Status: Positional Accuracy:	Elegant Touch 54 Roper St, Whitehaven, Cumbria, CA28 7AU Fireplaces & Mantelpieces Inactive Manually positioned to the address or location	A18SW (N)	431	-	297266 518032
	Contemporary Trad	e Directory Entries				
146	Name: Location: Classification: Status: Positional Accuracy:	Kone Cranes Unit A24, Haig Enterprise Park, Whitehaven, Cumbria, CA28 9AN Lifting Equipment Active Automatically positioned to the address	A12NE (W)	435	-	296790 517592
	Contemporary Trad	e Directory Entries				
147	Name: Location: Classification: Status: Positional Accuracy:	Westways Westways, Low Road, Whitehaven, Cumbria, CA28 9HS Garage Services Inactive Automatically positioned to the address	A8NE (S)	443	-	297388 517103
	Contemporary Trad	e Directory Entries				
147	Name: Location: Classification: Status: Positional Accuracy:	West-Ways Services Westways, Low Road, Whitehaven, Cumbria, CA28 9HS Garage Services Inactive Automatically positioned to the address	A8NE (S)	443	-	297388 517103
	Contemporary Trad	e Directory Entries				
148	Name: Location: Classification: Status: Positional Accuracy:	West Cumbria Dental Laboratory 10, Scotch Street, Whitehaven, Cumbria, CA28 7BJ Medical & Dental Laboratories Inactive Automatically positioned to the address	A18SE (NE)	454	-	297450 518008
	Contemporary Trade Directory Entries					
149	Name: Location: Classification: Status: Positional Accuracy:	Esso Back Corkickle, Whitehaven, Cumbria, CA28 7TS Petrol Filling Stations Active Automatically positioned to the address	A14NW (E)	465	-	297775 517623
1	- ostional Accuracy.	ratemationly positioned to the address			Ì	

Map ID		Details			Contact	NGR
	Contemporary Trad	e Directory Entries				
149	Name: Location: Classification: Status: Positional Accuracy:	Corkickle Service Station Back Corkickle, Whitehaven, Cumbria, CA28 7TS Petrol Filling Stations Inactive Manually positioned to the address or location	A14NW (E)	475	-	297783 517634
	Contemporary Trad	e Directory Entries				
150	Name: Location: Classification: Status: Positional Accuracy:	Klick 5, Market Place, Whitehaven, Cumbria, CA28 7JD Photographic Processors Inactive Automatically positioned to the address	A18SW (N)	496	-	297207 518096
	Contemporary Trad	e Directory Entries				
151	Name: Location: Classification: Status: Positional Accuracy:	Hillarys Blinds Ltd 73, Lowther Street, Whitehaven, Cumbria, CA28 7AH Blinds, Awnings & Canopies Inactive Automatically positioned to the address	A18SE (NE)	501	-	297487 518042
	Contemporary Trad	e Directory Entries				
152	Name: Location: Classification: Status: Positional Accuracy:	Printpoint (Cumbria) Ltd 77, Lowther Street, Whitehaven, Cumbria, CA28 7RB Printers Inactive Automatically positioned to the address	A18SE (NE)	505	-	297538 518018
	Contemporary Trad	e Directory Entries				
153	Name: Location: Classification: Status: Positional Accuracy:	Whitehaven Harbour Commissioners 27, Lowther Street, Whitehaven, CA28 7DN Ports, Docks & Harbours Active Automatically positioned to the address	A18SE (N)	526	-	297314 518124
	Contemporary Trad	e Directory Entries				
154	Name: Location: Classification: Status: Positional Accuracy:	G Tyson 41, Basket Road, Whitehaven, Cumbria, CA28 9AH Cladding Suppliers & Installers Active Automatically positioned to the address	A17SE (NW)	537	-	296802 517924
	Contemporary Trad	e Directory Entries				
155	Name: Location: Classification: Status: Positional Accuracy:	Concept Auto Sport Unit E4, Haig Enterprise Park, Whitehaven, Cumbria, CA28 9AN Car Customisation & Conversion Specialists Inactive Automatically positioned to the address	A12SE (W)	539	-	296692 517519
	Contemporary Trad	e Directory Entries				
155	Name: Location: Classification: Status: Positional Accuracy:	24 Hour Vehicle Recovery Unit E3, Haig Enterprise Park, Whitehaven, Cumbria, CA28 9AN Breakdown and Recovery Inactive Automatically positioned to the address	A12SE (W)	546	-	296685 517520
	Contemporary Trad	e Directory Entries				
155	Name: Location: Classification: Status: Positional Accuracy:	Haven Sails & Rigging Ltd Unit D1, Haig Enterprise Park, Whitehaven, Cumbria, CA28 9AN Sailmakers & Repairers Inactive Automatically positioned to the address	A12SE (W)	576	-	296655 517516
	Contemporary Trad	e Directory Entries				
155	Name: Location: Classification: Status: Positional Accuracy:	Mcallister Birdsall Unit D1-D2, Haig Enterprise Park, Whitehaven, Cumbria, CA28 9AN Fencing Manufacturers Inactive Manually positioned to the address or location	A12SE (W)	576	-	296655 517516
	Contemporary Trad	e Directory Entries				
156	Name: Location: Classification: Status: Positional Accuracy:	Currys Digital 51, King Street, Whitehaven, Cumbria, CA28 7JH Electrical Goods Sales, Manufacturers & Wholesalers Inactive Manually positioned to the address or location	A18SW (N)	544	-	297226 518145
	Contemporary Trad	e Directory Entries				
157	Name: Location: Classification: Status: Positional Accuracy:	Fellside Fascia Unit E4,Haig Enterprise Pk, Whitehaven, Cumbria, CA28 9AN Fascias and Soffits Inactive Manually positioned within the geographical locality	A12NE (W)	550	-	296676 517577
1			1	1	1	

Map ID		Details			Contact	NGR
	Contemporary Trad	e Directory Entries				
158	Name: Location: Classification: Status: Positional Accuracy:	Lakeland 18, Church Street, Whitehaven, Cumbria, CA28 7EB Dry Cleaners Inactive Automatically positioned to the address	A18SE (N)	566	-	297362 518156
158	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Fotomax 18, Church Street, Whitehaven, Cumbria, CA28 7EB Printers Active Automatically positioned to the address	A18SE (N)	566	-	297362 518156
158	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Jolly Pots 21, Church Street, Whitehaven, Cumbria, CA28 7EB Ceramic Manufacturers, Supplies & Services Inactive Manually positioned to the address or location	A18SE (N)	586	-	297371 518174
159	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Ms Flooring 130, Queen Street, Whitehaven, CA28 7QF Carpet & Fabric Proofing Inactive Automatically positioned to the address	A18SE (N)	573	-	297446 518139
160	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Pondfield Garage Ltd Solway Road, WHITEHAVEN, Cumbria, CA28 9AW Car Body Repairs Inactive Automatically positioned to the address	A12SE (SW)	592	-	296722 517268
161	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Sembcorp Simon Carves Ltd 34, Lowther Street, Whitehaven, Cumbria, CA28 7JS Chemical Plant & Equipment Inactive Automatically positioned to the address	A18SE (N)	594	-	297272 518194
162	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries J R Services Castle Garage, Low Road, WHITEHAVEN, Cumbria, CA28 9HS Mot Testing Centres Active Automatically positioned to the address	A8NE (S)	598	-	297421 516952
163	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Genesis 5, New Street, Whitehaven, Cumbria, CA28 7DY Electrical Goods Sales, Manufacturers & Wholesalers Inactive Automatically positioned to the address	A18SE (N)	608	-	297329 518204
163	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Genesis Home Appliances 5, New Street, Whitehaven, Cumbria, CA28 7DY Electrical Goods Sales, Manufacturers & Wholesalers Active Automatically positioned to the address	A18SE (N)	608	-	297329 518204
163	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries P D Hendren 15, King Street, Whitehaven, Cumbria, CA28 7ED Photographic Processors Inactive Automatically positioned to the address	A18SE (N)	637	-	297334 518233
164	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries B C Goulding Cabinet Maker Marlborough Street, Whitehaven, Cumbria, CA28 7LL Joinery Manufacturers Active Automatically positioned to the address	A18SW (N)	616	-	297216 518217
165	Contemporary Trade Name: Location: Classification: Status: Positional Accuracy:	e Directory Entries Emmell Cleaning Services 1, Prospect Hill, Whitehaven, Cumbria, CA28 9AE Commercial Cleaning Services Active Automatically positioned to the address	A17SE (NW)	637	-	296849 518107

Map ID		Details			Contact	NGR
	Contemporary Trad	e Directory Entries				
165	Name: Location: Classification: Status: Positional Accuracy:	Emmell Cleaning Services 1, Prospect Hill, Whitehaven, Cumbria, CA28 9AE Commercial Cleaning Services Inactive Automatically positioned to the address	A17SE (NW)	637	-	296849 518107
	Contemporary Trad	e Directory Entries				
166	Name: Location: Classification: Status: Positional Accuracy:	Washright 15, New Street, Whitehaven, Cumbria, CA28 7DY Laundries & Launderettes Active Automatically positioned to the address	A18NE (N)	659	-	297365 518250
	Contemporary Trad	e Directory Entries				
167	Name: Location: Classification: Status: Positional Accuracy:	Open World Yachts 2 Duke St, Whitehaven, Cumbria, CA28 7ER Boatbuilders & Repairers Inactive Manually positioned to the road within the address or location	A18NE (N)	724	-	297350 518318
	Contemporary Trad	e Directory Entries				
167	Name: Location: Classification: Status: Positional Accuracy:	Whitehaven Harbour Commissioners Pears House, 1, Duke Street, Whitehaven, Cumbria, CA28 7HW Ports, Docks & Harbours Inactive Automatically positioned to the address	A18NE (N)	762	-	297330 518359
	Contemporary Trad	e Directory Entries				
167	Name: Location: Classification: Status: Positional Accuracy:	Whitehaven Harbour Commissioners Pears House, 1, Duke Street, Whitehaven, Cumbria, CA28 7HW Ports, Docks & Harbours Inactive Automatically positioned to the address	A18NE (N)	762	-	297330 518359
	Contemporary Trad	e Directory Entries				
167	Name: Location: Classification: Status: Positional Accuracy:	Whitehaven Marina Ltd Pears House, 1, Duke Street, WHITEHAVEN, Cumbria, CA28 7HW Ports, Docks & Harbours Inactive Automatically positioned to the address	A18NE (N)	762	-	297330 518359
	Contemporary Trad	e Directory Entries				
168	Name: Location: Classification: Status: Positional Accuracy:	Beauty Box 6, Tangier Street, Whitehaven, Cumbria, CA28 7UZ Perfume Suppliers Inactive Automatically positioned to the address	A18NE (N)	795	-	297412 518379
	Contemporary Trad	e Directory Entries				
169	Name: Location: Classification: Status: Positional Accuracy:	B & H Motors High Street, Whitehaven, Cumbria, CA28 7PY Car Dealers Inactive Automatically positioned to the address	A19NW (NE)	872	-	297690 518353
	Contemporary Trad	e Directory Entries				
169	Name: Location: Classification: Status: Positional Accuracy:	B & H Motors Ltd High Street, Whitehaven, Cumbria, CA28 7PY Car Customisation & Conversion Specialists Active Automatically positioned to the address	A19NW (NE)	872	-	297690 518353
	Contemporary Trad	e Directory Entries				
170	Name: Location: Classification: Status: Positional Accuracy:	Quality Cleaning & Contracting Ltd Office 6 Fish Hall, Whitehaven, Cumbria, CA28 7XE Cleaning Services - Domestic Active Manually positioned within the geographical locality	A18NE (N)	907	-	297465 518482
	Contemporary Trad	e Directory Entries				
171	Name: Location: Classification: Status: Positional Accuracy:	Whitehaven Cemetery Low Road, Whitehaven, Cumbria, CA28 9HU Cemeteries & Crematoria Active Automatically positioned to the address	A8SE (S)	949	-	297503 516610
	Contemporary Trad	e Directory Entries				
172	Name: Location: Classification: Status:	C G Ford Meadow Rd, Whitehaven, Cumbria, CA28 9HX Car Dealers Inactive	A9SW (SE)	953	-	297668 516666
	Positional Accuracy:	Manually positioned to the road within the address or location				

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
173	Fuel Station Entries Name: Location: Brand: Premises Type: Status: Positional Accuracy:	Former Garage Preston Street, WHITEHAVEN, Cumbria, CA28 9DL OBSOLETE Not Applicable Obsolete Approximate location provided by supplier	A13NW (NW)	190	-	297135 517760
174	Fuel Station Entries Name: Location: Brand: Premises Type: Status: Positional Accuracy:	Morrisons Whitehaven Flatt Walks, Whitehaven, Cumbria, CA28 7RJ Morrisons Hypermarket Open Manually positioned to the address or location	A14NW (NE)	382	-	297625 517786
175	Fuel Station Entries Name: Location: Brand: Premises Type: Status: Positional Accuracy:	Corkickle Service Station Back Corkickle, Whitehaven, Cumbria, CA28 7TS ESSO Petrol Station Open Manually positioned to the address or location	A14NW (E)	464	-	297773 517625
176	Fuel Station Entries Name: Location: Brand: Premises Type: Status: Positional Accuracy:	Tesco Whitehaven Bransty Row, North Shore, Whitehaven, Cumbria, CA28 7XY TESCO Hypermarket Open Manually positioned to the address or location	A18NE (N)	990	-	297482 518563
177	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Kwik-Fit (GB) Limited Preston Street, Whitehaven, CA28 9DL Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (NW)	33	9	297199 517613
177	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Preston Street Garage Preston Street, Whitehaven, CA28 9DL Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (NW)	65	9	297183 517642
177	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Preston Street Garage Preston Street, Whitehaven, CA28 9DL Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (NW)	65	9	297183 517642
178	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Coach Road Motorworks The Old Motor Works, Coach Road, Whitehaven, CA28 9DB Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13SE (SE)	146	9	297368 517424
178	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services N Vaughan Border House, Coach Road, Whitehaven, CA28 9DF Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13SE (SE)	161	9	297422 517447
179	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Kwik-Fit (GB) Limited Newtown, Whitehaven, CA28 7HX Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (NW)	223	9	297128 517794
180	Points of Interest - C Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Pottery Bodyworks Unit 3, Pottery Road, Whitehaven, CA28 9BZ Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13SE (S)	252	9	297373 517302

Map ID		Details			Contact	NGR
180	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Pottery Bodyworks Ltd Unit 3, Pottery Road, Whitehaven, CA28 9BZ Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13SE (S)	252	9	297373 517302
181	Points of Interest - 0 Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services G J Autos Ltd Atlas Engineering Works, Newtown, Whitehaven, CA28 7HX Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (N)	300	9	297146 517883
181	Points of Interest - 0 Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services G & J Autos Ltd Atlas Engineering Works, Newtown, Whitehaven, CA28 7HX Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A13NW (N)	300	9	297146 517883
182	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services T Lewthwaite Lewthwaite, Flatt Walks, Whitehaven, CA28 7RW Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A14NW (E)	322	9	297623 517655
182	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Tom Lewthwaite Lewthwaite, Flatt Walks, Whitehaven, CA28 7RW Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A14NW (E)	322	9	297623 517655
182	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Norman Strickland Flatt Walks, Whitehaven, CA28 7RW Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A14NW (E)	328	9	297633 517638
182	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Stephenson Auto Body Repairs Unit 1 Rope Walk, Coach Road, Whitehaven, CA28 7TE Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A14NW (E)	360	9	297665 517643
183	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Morrisons Whitehaven Flatt Walks, Whitehaven, CA28 7RJ Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A14NW (NE)	382	9	297625 517786
183	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Car Wash Flatt Walks, Whitehaven, Cumbria, CA28 7RJ Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A14NW (NE)	382	9	297625 517786
184	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Westways Westways, Low Road, Whitehaven, CA28 9HS Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A8NE (S)	443	9	297388 517103
184	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services West-Ways Body & Mechanical Services Westways, Low Road, Whitehaven, CA28 9HS Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A8NE (S)	443	9	297388 517103
184	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Westways Westways, Low Road, Whitehaven, CA28 9HS Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A8NE (S)	443	9	297388 517103

Map ID		Details			Contact	NGR
	Points of Interest - (Commercial Services				
185	Name: Location: Category: Class Code: Positional Accuracy:	Corkickle Service Station Back Corkickle, Whitehaven, CA28 7TS Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A14NW (E)	464	9	297773 517625
185	Points of Interest - 0 Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Car Wash Back Corkickle, Whitehaven, CA28 7TS Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A14NW (E)	464	9	297773 517625
186	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Pondfield Garage Ltd Solway Road, Whitehaven, CA28 9AW Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A12SE (SW)	592	9	296722 517268
186	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Pondfield Garage Solway Road, Whitehaven, CA28 9AW Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A12SE (SW)	592	9	296722 517268
187	Points of Interest - 0 Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services J R Services Castle Garage, Low Road, Whitehaven, CA28 9HS Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A8NE (S)	598	9	297421 516952
187	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services J R Services Castle Garage, Low Road, Whitehaven, CA28 9HS Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A8NE (S)	598	9	297421 516952
	Points of Interest - (Commercial Services				
188	Name: Location: Category: Class Code: Positional Accuracy:	Autoglass Ltd 10 Catherine Street, Whitehaven, CA28 7PA Repair and Servicing Vehicle Repair, Testing and Servicing Positioned to address or location	A19SW (NE)	601	9	297666 518052
189	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Tesco Whitehaven Bransty Row, North Shore, Whitehaven, CA28 7XY Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A18NE (N)	990	9	297482 518563
189	Points of Interest - (Name: Location: Category: Class Code: Positional Accuracy:	Commercial Services Car Wash Bransty Row, North Shore, Whitehaven, Cumbria, CA28 7XY Personal, Consumer and other Services Vehicle Cleaning Services Positioned to address or location	A18NE (N)	990	9	297482 518563
	Points of Interest - I	Manufacturing and Production				
190	Name: Location: Category: Class Code: Positional Accuracy:	Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NE (N)	157	9	297306 517747
190	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NE (N)	157	9	297306 517747
190	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NW (N)	182	9	297257 517783

Map ID		Details			Contact	NGR
190	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NW (N)	182	9	297257 517783
191	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NW (N)	308	9	297144 517891
191	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A13NW (N)	308	9	297144 517891
192	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Waterside Investments Unit A1, Haig Enterprise Park, Whitehaven, CA28 9AN Industrial Features Business Parks and Industrial Estates Positioned to address or location	A12NE (W)	435	9	296790 517592
192	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Mine (Disused) CA28 Extractive Industries Unspecified Quarries Or Mines Positioned to an adjacent address or location	A12NE (W)	497	9	296729 517594
192	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Haig Enterprise Park CA28 Industrial Features Business Parks and Industrial Estates Positioned to an adjacent address or location	A12NE (W)	545	9	296681 517610
193	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A8NE (S)	526	9	297371 517013
194	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A18SW (N)	608	9	297216 518209
194	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A18SW (N)	609	9	297216 518210
195	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A8NE (S)	611	9	297353 516923
196	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A8NE (S)	656	9	297440 516897
196	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A8NE (S)	657	9	297440 516896



Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Points of Interest - I	Manufacturing and Production				
197	Name: Location: Category: Class Code: Positional Accuracy:	Tank CA28 Industrial Features Tanks (Generic) Positioned to address or location	A18NW (N)	687	9	297042 518257
197	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Tanks CA28 Industrial Features Tanks (Generic) Positioned to an adjacent address or location	A18NW (N)	687	9	297042 518257
198	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Tank CA28 Industrial Features Tanks (Generic) Positioned to an adjacent address or location	A8SE (S)	744	9	297341 516787
199	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Mine (Disused) CA28 Extractive Industries Unspecified Quarries Or Mines Positioned to address or location	A12SW (W)	817	9	296439 517375
200	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Works Not Supplied Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A18NE (N)	886	9	297467 518460
200	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Wanufacturing and Production Works CA28 Industrial Features Unspecified Works Or Factories Positioned to an adjacent address or location	A18NE (N)	887	9	297467 518461
201	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Tank CA28 Industrial Features Tanks (Generic) Positioned to an adjacent address or location	A18NW (N)	928	9	297096 518517
202	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Manufacturing and Production Quarry (Disused) CA28 Extractive Industries Unspecified Quarries Or Mines Positioned to an adjacent address or location	A8SW (S)	967	9	297173 516562
203	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure W M Morrisons Petrol Station Flatt Walks, Whitehaven, CA28 7RW Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (NE)	382	9	297625 517786
203	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Morrisons Whitehaven Flatt Walks, Whitehaven, CA28 7RJ Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (NE)	382	9	297625 517786
204	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Rail Station CA28 Public Transport, Stations and Infrastructure Railway Stations, Junctions and Halts Positioned to address or location	A14SW (E)	448	9	297736 517416
204	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Station Station Road, CA28 Public Transport, Stations and Infrastructure Railway Stations, Junctions and Halts Positioned to address or location	A14SW (E)	448	9	297736 517416

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
205	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Service Station Back Corkickle, Whitehaven, CA28 7TS Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (E)	464	9	297773 517625
205	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Service Station Back Corkickle, Whitehaven, CA28 7TS Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (E)	465	9	297775 517623
205	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Esso Back Corkickle, Whitehaven, CA28 7TS Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (E)	465	9	297775 517623
205	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Service Station Back Corkickle, Whitehaven, CA28 7TS Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (E)	465	9	297775 517623
205	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Corkickle Service Station Back Corkickle, Whitehaven, CA28 7TS Road And Rail Petrol and Fuel Stations Positioned to address or location	A14NW (E)	475	9	297783 517634
206	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Whitehaven Police Station County Police Station, Scotch Street, Whitehaven, CA28 7NN Central and Local Government Police Stations Positioned to address or location	A18SE (NE)	582	9	297579 518084
207	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Cemetery CA28 Infrastructure and Facilities Cemeteries and Crematoria Positioned to an adjacent address or location	A8SE (S)	928	9	297444 516618
207	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Cemetery CA28 Infrastructure and Facilities Cemeteries and Crematoria Positioned to an adjacent address or location	A8SE (S)	931	9	297572 516651
207	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Whitehaven Cemetery Low Road, Whitehaven, CA28 9HU Infrastructure and Facilities Cemeteries and Crematoria Positioned to address or location	A8SE (S)	949	9	297503 516610
207	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Whitehaven Cemetery Low Road, Whitehaven, CA28 9HU Infrastructure and Facilities Cemeteries and Crematoria Positioned to address or location	A8SE (S)	949	9	297503 516610
208	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Bus Depot CA28 Public Transport, Stations and Infrastructure Bus and Coach Stations, Depots and Companies Positioned to address or location	A18NE (N)	937	9	297472 518511
208	Points of Interest - I Name: Location: Category: Class Code: Positional Accuracy:	Public Infrastructure Tesco Petrol Filling Station Bransty Row, North Shore, Whitehaven, CA28 7XY Road And Rail Petrol and Fuel Stations Positioned to address or location	A18NE (N)	989	9	297482 518562

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Points of Interest - F	Public Infrastructure				
208	Name: Location: Category: Class Code: Positional Accuracy:	Tesco Whitehaven Bransty Row, North Shore, Whitehaven, CA28 7XY Road And Rail Petrol and Fuel Stations Positioned to address or location	A18NE (N)	990	9	297482 518563
	Points of Interest - F	Recreational and Environmental				
209	Name: Location: Category: Class Code: Positional Accuracy:	Whitehaven Playground Nr Castle Meadows, CA28 Recreational Playgrounds Positioned to address or location	A13NE (NE)	170	9	297442 517677
	Points of Interest - F	Recreational and Environmental				
209	Name: Location: Category: Class Code: Positional Accuracy:	Whitehaven Playground Not Supplied Recreational Playgrounds Positioned to an adjacent address or location	A13NE (NE)	171	9	297427 517693
	Points of Interest - Recreational and Environmental					
209	Name: Location: Category: Class Code: Positional Accuracy:	Whitehaven Playground Castle Meadows, CA28 Recreational Playgrounds Positioned to an adjacent address or location	A13NE (NE)	171	9	297427 517693
	Points of Interest - F	Recreational and Environmental				
209	Name: Location: Category: Class Code: Positional Accuracy:	Whitehaven Playground Not Supplied Recreational Playgrounds Positioned to an adjacent address or location	A13NE (NE)	227	9	297509 517680
	Points of Interest - F	Recreational and Environmental				
210	Name: Location: Category: Class Code: Positional Accuracy:	Playground Not Supplied Recreational Playgrounds Positioned to an adjacent address or location	A19SW (NE)	499	9	297677 517907
	Points of Interest - F	Recreational and Environmental				
210	Name: Location: Category: Class Code: Positional Accuracy:	Playground Flatt Walks, CA28 Recreational Playgrounds Positioned to an adjacent address or location	A19SW (NE)	499	9	297677 517907



Sensitive Land Use

Map ID		Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Ancient Woodland					
211	Name: Reference: Area(m²): Type:	Crowpark Wood 1100224 39468.99 Ancient and Semi-Natural Woodland	A14NW (E)	582	10	297861 517763
	Ancient Woodland					
212	Name: Reference: Area(m²): Type:	Midgey Wood 1100225 56083 Ancient and Semi-Natural Woodland	A14NW (E)	628	10	297938 517623
	Marine Nature Rese	rves				
213	Name: Multiple Area: Area (m2): Source:	Cumbria Coast Y 13196509.3 Natural England	A12SW (W)	899	10	296382 517282
	Sites of Special Sci	entific Interest				
214	Name: Multiple Areas: Total Area (m2): Source: Reference: Designation Details: Designation Date: Date Type: Designation Details: Date Type: Designation Date: Date Type: Designation Date: Designation Date: Designation Date: Designation Date: Designation Date: Date Type:	St. Bees Head Y 1572402.43 Natural England 1001877 Heritage Coast 28th November 1995 Notified RSPB Reserve 28th November 1995 Notified Geological Conservation Review 28th November 1995 Notified Site Of Special Scientific Interest 28th November 1995 Notified Site Of Special Scientific Interest 28th November 1995 Notified	A12SW (SW)	779	10	296522 517259

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Allerdale Borough Council - Environmental Protection	March 2015	Annual Rolling Update
Copeland Borough Council - Environmental Health Department	October 2014	Annual Rolling Update
Discharge Consents		
Environment Agency - North West Region	July 2016	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - North West Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - North West Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control		
Environment Agency - North West Region	July 2016	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Copeland Borough Council - Environmental Health Department	February 2015	Annual Rolling Update
Allerdale Borough Council - Environmental Protection	June 2016	Annual Rolling Update
Local Authority Pollution Prevention and Controls		
Copeland Borough Council - Environmental Health Department	February 2015	Annual Rolling Update
Allerdale Borough Council - Environmental Protection	June 2016	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Copeland Borough Council - Environmental Health Department	February 2015	Annual Rolling Update
Allerdale Borough Council - Environmental Protection	June 2016	Annual Rolling Update
Nearest Surface Water Feature		
Ordnance Survey	July 2012 Quarterly	
Pollution Incidents to Controlled Waters		
Environment Agency - North West Region	January 2000	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - North West Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - North West Region	March 2013	As notified
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points	,	,
Environment Agency - Head Office	July 2012 Annually	
Substantiated Pollution Incident Register		
Environment Agency - North West Region - North Area	July 2016 Quarterly	
Water Abstractions		
Environment Agency - North West Region	July 2016 Quarterly	
Water Industry Act Referrals	,	
Environment Agency - North West Region	July 2016	Quarterly
Groundwater Vulnerability	,	
Environment Agency - Head Office	April 2015	Not Applicable
Environment Agency - Head Office	Januarv 1999	Not Applicable
Bedrock Aquifer Designations	,	11
British Geological Survey - National Geoscience Information Service	August 2015	As notified
Superficial Aquifer Designations		
British Geological Survey - National Geoscience Information Service		
	August 2015 As notified	
Source Protection Zones	August 2015	As notified

Agency & Hydrological	Version	Update Cycle
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2016	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2016	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	August 2016	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	August 2016	Quarterly
Flood Defences		
Environment Agency - Head Office	August 2016	Quarterly
Detailed River Network Lines		
Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage		
Environment Agency - Head Office	March 2012	Annually
Surface Water 1 in 30 year Flood Extent		
Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 100 year Flood Extent		
Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 1000 year Flood Extent		
Environment Agency - Head Office	October 2013	As notified
Surface Water Suitability		
Environment Agency - Head Office	October 2013	As notified
BGS Groundwater Flooding Susceptibility		
British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Integrated Pollution Control Registered Waste Sites		
Environment Agency - North West Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - North West Region - North Area	August 2016	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - North West Region - North Area	July 2016	Quarterly
Local Authority Landfill Coverage		
Allerdale Borough Council - Environmental Protection	May 2000	Not Applicable
Copeland Borough Council - Environmental Health Department	May 2000	Not Applicable
Cumbria County Council - Economy And Environment Department	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Allerdale Borough Council - Environmental Protection	May 2000	Not Applicable
Copeland Borough Council - Environmental Health Department	May 2000	Not Applicable
Cumbria County Council - Economy And Environment Department	May 2000	Not Applicable
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites		
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	July 2016	Bi-Annually
Explosive Sites		
Health and Safety Executive	February 2016	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Copeland Borough Council - Planning	February 2016	Annual Rolling Update
Cumbria County Council - Development Control	February 2016	Annual Rolling Update
Allerdale Borough Council	March 2014	Annual Rolling Update
Planning Hazardous Substance Consents		
Copeland Borough Council - Planning	February 2016	Annual Rolling Update
Cumbria County Council - Development Control	February 2016	Annual Rolling Update
Allerdale Borough Council	January 2016	Annual Rolling Update

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015 As notified	
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	May 2016	Bi-Annually
Brine Compensation Area Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified
Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	June 2016	Quarterly
Fuel Station Entries Catalist Ltd - Experian	July 2016	Quarterly
Gas Pipelines National Grid	July 2014	Quarterly
Points of Interest - Commercial Services PointX	September 2016	Quarterly
Points of Interest - Education and Health PointX	September 2016	Quarterly
Points of Interest - Manufacturing and Production PointX	September 2016	Quarterly
Points of Interest - Public Infrastructure PointX	September 2016	Quarterly
Points of Interest - Recreational and Environmental PointX	September 2016	Quarterly
Underground Electrical Cables National Grid	January 2016	Bi-Annually

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural England	August 2016	Bi-Annually
Areas of Outstanding Natural Beauty		
Natural England	April 2016	Bi-Annually
Environmentally Sensitive Areas		
Natural England	September 2016	Annually
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Natural England	April 2016	Bi-Annually
Marine Nature Reserves		
Natural England	September 2016	Bi-Annually
National Nature Reserves		
Natural England	September 2016	Bi-Annually
National Parks		
Natural England	August 2016	Bi-Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	April 2016	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	Annually
Ramsar Sites		
Natural England	April 2016	Bi-Annually
Sites of Special Scientific Interest		
Natural England	April 2016	Bi-Annually
Special Areas of Conservation		
Natural England	April 2016	Bi-Annually
Special Protection Areas		
Natural England	April 2016	Bi-Annually
World Heritage Sites		
English Heritage - National Monument Record Centre	September 2015	Bi-Annually



A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	Map data
Environment Agency	Environment Agency
Scottish Environment Protection Agency	Scottish Environment Protection Agency
The Coal Authority	THE COAL AUTHORITY
British Geological Survey	British Geological Survey
Centre for Ecology and Hydrology	Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	Cyfoeth Naturiol Cymru Natural Resources Wales
Scottish Natural Heritage	SCOTTISH NATURAL HERITAGE
Natural England	NATURAL ENGLAND
Public Health England	Public Health England
Ove Arup	ARUP
Peter Brett Associates	peterbrett

Useful Contacts

Contact	Name and Address	Contact Details	
2	British Geological Survey - Enquiry Service British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk	
3	Environment Agency - National Customer Contact Centre (NCCC)	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk	
4	Copeland Borough Council - Environmental Health	Telephone: 01946 852585	
	Department P O Box 19, Council Offices, Catherine Street, Whitehaven, Cumbria, CA28 7NY	Fax: 01946 590123 Email: dev.env@copelandbc.gov.uk Website: www.copelandbc.gov.uk	
5	Cumbria County Council - Economy And Environment Department	Telephone: 01228 606718 Website: www.cumbria.gov.uk	
	Citadel Chambers, Citadel Row, Carlisle, Cumbria, CA3 8SG		
6	Health and Safety Executive 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk	
7	The Coal Authority - Property Searches 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk	
8	Peter Brett Associates Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN	Telephone: 0118 950 0761 Fax: 0118 959 7498 Email: reading@pba.co.uk Website: www.pba.co.uk	
9	PointX	Website: www.pointx.co.uk	
	7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY		
10	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk	
11	Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	Telephone: 0113 2613333 Fax: 0113 230 0879	
	Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT		
12	Environment Agency - Head Office	Telephone: 01454 624400	
	Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	T ax. 01434 024403	
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk	
	Chilton, Didcot, Oxfordshire, OX11 0RQ	Website: www.ukradon.org	
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk	

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

Appendix 1

CBR Test Results

(6 Pages)

TD Construction Testing Ltd Gerards Hall Lord Street St Helens Merseyside WA10 2SD		CONSTRUCTION TESTING
1:01744734769	TEST REPORT	
E: enquiries@tdconstructiontesting.co.uk		

Test Report No.	TD16-D-03-A-01	Date of Report	20/10/2016
Client:	DTS Raeburn		
Address:	Moor Lane, Witton, Birmingham, B6 7HG		
Contact:	James Lawrence		
Site:	Whitehaven		
Test Requested:	Plate Loading Test to obtain A	Approximate CBR va	alue
Test Method:	In-house procedure C56 based u DMRB Vol 7 HD25/94 and IAN	upon BS1377 Part 9:1 N 73/06	990 Clause 4,
Material: Supplier/Source: Moisture Content %:	Stony Soil N/K N/A		
Location: Depth: Plate Size mm:	CBR 1 N/K 300		
Date Tested:	18/10/16		
Weather Conditions:	Heavy Rain		
Tested By:	S.D		
Kentledge Type:	14T Excavator		
Comments			

TD16-D-03-A-01

Stress (kN/m2)	Settlement (mm)
0	0.00
94	0.33
148	0.69
189	1.03
216	1.42
243	1.68
271	2.10
311	2.31





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_[X]D. Ames, Laboratory Manager

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Gerards Hall Image: Construction testing.co.uk Lord Street Image: Construction testing.co.uk St Helens Image: Construction testing.co.uk Merseyside Image: Construction testing.co.uk WA10 2SD Image: Construction testing.co.uk
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Test Report No.	TD16-D-03-A-02	Date of Report	20/10/2016
Client:	DTS Raeburn		
Address:	Moor Lane, Witton, Birmingham, B6 7HG		
Contact:	James Lawrence		
Site:	Whitehaven		
Test Requested:	Plate Loading Test to obtain A	Approximate CBR va	alue
Test Method:	In-house procedure C56 based u DMRB Vol 7 HD25/94 and IAN	npon BS1377 Part 9:1 N 73/06	990 Clause 4,
Material: Supplier/Source: Moisture Content %:	Stony Soil N/K N/A		
Location: Depth: Plate Size mm:	CBR 3 N/K 300		
Date Tested:	18/10/16		
Weather Conditions:	Heavy Rain		
Tested By:	S.D		
Kentledge Type:	14T Excavator		
Comments			

TD16-D-03-A-02

Stress (kN/m2)	Settlement (mm)
0	0.00
31	0.32
48	0.57
66	0.85
96	1.12
125	1.40
149	1.66
172	1.95
0	0.67





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_[X] D. Ames, Laboratory Manager

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TD Construction Testing Ltd Gerards Hall Lord Street St Helens Merseyside		
WA10 2SD	8011	CONSTRUCTION TESTING
T: 01744 734 769	TEST REPORT	
E: enquiries@tdconstructiontesting.co.uk		

Test Report No.	TD16-D-03-A-03	Date of Report	20/10/2016
Client:	DTS Raeburn		
Address:	Moor Lane, Witton, Birmingham, B6 7HG		
Contact:	James Lawrence		
Site:	Whitehaven		
Test Requested:	Plate Loading Test to obtain A	Approximate CBR v	alue
Test Method:	In-house procedure C56 based u DMRB Vol 7 HD25/94 and IAN	upon BS1377 Part 9:1 N 73/06	990 Clause 4,
Material: Supplier/Source: Moisture Content %:	Stony Soil N/K N/A		
Location: Depth: Plate Size mm:	CBR 2 N/K 300		
Date Tested:	18/10/16		
Weather Conditions:	Heavy Rain		
Tested By:	S.D		
Kentledge Type:	14T Excavator		
Comments	Page	e 1 of 2	

TD16-D-03-A-03

Stress (kN/m2)	Settlement (mm)
0	0.00
43	0.28
66	0.47
90	0.71
108	1.07
125	1.36
143	1.77
161	2.17
0	0.66





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_[X] D. Ames, Laboratory Manager

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Appendix 2

Borehole Records

(19 Pages)

		тс					Moor La	ne, Witton, Birmingham, B6 7HG	Borehole N	0.
	D	12	K/	AEBU	KN		en	+44 (0) 121 3445885 guiries@dts-raeburn.co.uk	BH1	
			GEOTECHN	ICAL & ENVIRONMENTAL	ENGINEERIN	IG	Ch	www.dts-raeburn.co.uk	Sheet 1 of	4
Projec	ct Name:	: Wh	itehaven	Pro	oject No.		Co-ords:	461840E - 6044095N	Hole Type	::
Locati	ion:	Pre	ston Stree	t, Whithaven, Cumbria	3		Level:	9.75m AOD	Scale:	
Client	•	Mo	rbaine I td				Dates:	18/10/2016 - 19/10/2016	Logged by	<i>'</i> :
									JO/JL	
Well	Water Strikes	Depth (m	amples and	Results	Depth (m bgl)	(m AOD)	Legend	Stratum Description		
	0.30 D 0.80 B 0.80 D 1.20 D 1.20 SPT N=8 (1,2/3,2 1.70 B		N=8 (1,2/3,2,2,1)	0.75	9.00		to subrounded, fine to coarse gravel of brick, sandsto mudstone, ceramic and coal. Cobbles are subangular subrounded, of brick and sandstone. MADE GROUND: Black and brown ashy, silty, gravelly, cobbly firm clay. Gravel and cobles are angular to subrounded, fine to coarse of brick, mudstone, sandstone and ceramic.			
		1.70 2.20 2.20	B D SPT	N=6 (0,1/1,1,1,3)	2.20	7.55		Soft reddish brown very sandy CLAY. (Tra	ces of	2
		2.70 3.20 2.20	B	N-16 (2 2/2 4 4 5)	2.60	7.15		Red slightly clayey fine to medium SAND		3
		3.20 SPT N=16 (2,3/3,4,4,5) 3.70 B		N=10 (2,3/3,4,4,3)	4 15	5 60				4 -
		4.20 4.20 4.70	B	N=15 (2,4/3,4,4,4)	4.05	5.00		4.15-4.95 Brown slightly clayey fine to m and subangular to subrounded fine to m of sandstone and mudstone.	edium SAND edium GRAVEL	
		4.95 5.20 5.70	U		4.95	4.80		Stiff grey slightly silty, slightly gravelly, or cobbly CLAY. Gravel is subangular to sub coarse of sandstone and mudstone.	casionally rounded, fine to	5
		6.00	В		6.00	3.75		Stiff grey slightly silty, slightly gravelly CL subangular to subrounded, fine to coars	AY. Gravel is e with	6 -
		6.70	SPT	N=52 (9,8/11,13,14,14)				occasional cobbles of sandstone and mu	dstone.	7
		7.50	В							8
		8.70 9.00	B							9
		9.70 9.70	D SPT	50 (18,20/50 for 50mm)	9.60	0.15	· · · · · · · · · · · · · · · · · · ·	Grey SANDSTONE with interbedded ban mudstone (driller Continued on next sheet	ds of silt/	10 -
Remarks	Cable p	l ercussion (drilling to S	l 9.7m bgl, followed by r	rotary oper	l hole met	hods to 35n	n bgl.	Final	I

	D	S				G	Moor La en	ane, \ +4 nquir ww	Witton, Birmingham, B6 7HG 4 (0) 121 3445885 ies@dts-raeburn.co.uk w.dts-raeburn.co.uk	Borehole No. BH1 Sheet 2 of 4		
Project	Name:		Whiteh	aven	F	Project No. E12964		Co-ords:		461840E - 6044095N	Hole Type CP+RO	:
Locatio	n:		Preston	Street	, Whithaven, Cumb	ria		Level:		9.75m AOD	Scale: 1:50	
Client:			Morbaii	ne Ltd				Dates:		18/10/2016 - 19/10/2016	Logged by JO/JL	:
Well	Water Strikes		Sampl	es and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description		
	Cable po	ercuss	ion drillin	ng to 9	.7m bgl, followed b	y rotary open	hole met	hods to 351	de: m bg	Continued on next sheet		
Remarks											Final	

Project Name: Whitehaven Project No. Co-ards: 461840E - 6044025N Hole Type: CP-R0 Coration: Preston Street, Whitehaven, Cumbria reveit: 9.75m A0D 15504e: 15504e: 15504e Clent: Morbalne Ind Date: 18/10/2016 - 19/10/2016 10/202016 Well Street, Togeth (m 14g) Type Prevains 1999 Leedin 18/10/2016 - 19/10/2016 10/2016 Well Street, Togeth (m 14g) Type Prevains 1999 Leedin 1997 1997 Well Street, Togeth (m 14g) Type Prevains 1998 1997		D	T	S GEO				IG	Moor La	ane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 nquiries@dts-raeburn.co.uk www.dts-raeburn.co.uk	Borehole N BH1 Sheet 3 of	lo. 4
Location: Preston Street, Whitheen, Cumbria Level: 9.75m AOD Solare. 1.93 Client: Morbaine Itd Date: 18/10/2016 - 13/10/2016 10gged by: 10/11 Well States Deption bigl Type Treeting Treeting States Deption bigl Type Treeting Treeting Stratum Description	Projec	t Name:		Whiteh	aven	Pr	roject No. 12964		Co-ords:	461840E - 6044095N	Hole Type CP+RO	::
Client: Morbaine It d Date: Uk/10/2016 - 19/10/2016 Lagged by: J.O/II Well Water Schler Samples and in Situ Iteating Depth In bell Depth Inpel Depth Results Level (m.kob) Level (m.kob) Level (m.kob) Level Stratum Description Stratum Description Image: Schler Depth In bell Topic Results Image: Schler Stratum Description Image: Schler Image	Locati	on:		Preston	Street	t, Whithaven, Cumbr	ia		Level:	9.75m AOD	Scale: 1:50	
Week Sample and in Situ Heiting Pageth (reek (in bol) Usered Stratum Description Weik Depth (m bel) Type Results In abl In abl In abl Stratum Description Weik Depth (m bel) Type Results In abl In abl In abl In able In abl	Client	:		Morbai	ne Ltd				Dates:	18/10/2016 - 19/10/2016	Logged by JO/JL	/:
28.60 -18.55 COAL (delle description) 29 Cable percussion drilling to 9.7m bgl, followed by rotary open hole methods to 35m bgl. COAL (delle description)	Well	Water Strikes	Dept	Samp	les and Type	In Situ Testing Results	Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
Final		Cable p	ercuss	sion drilli	ng to 9	.7m bgl, followed by	28.60 29.30 29.70	-18.85 -19.55 -19.95	hods to 35	COAL (driller description) MUDSTONE (driller description) COAL (driller description) COAL (driller description) MUDSTONE (driller description)		21
	Remark										Final	

	D	T	S				G	Moor Li	ane, ' +4 nquir ww	Witton, Birmingham, B6 7HG 14 (0) 121 3445885 ries@dts-raeburn.co.uk w.dts-raeburn.co.uk	Borehole N BH1 Sheet 4 of	lo. 4
Projec	t Name:	:	Whiteh	aven	Pr E1	oject No. 2964		Co-ords:		461840E - 6044095N	Hole Type CP+RO	2:
Locati	on:		Preston	Street	, Whithaven, Cumbri	а		Level:		9.75m AOD	Scale: 1:50	
Client	:		Morbai	ne Ltd				Dates:		18/10/2016 - 19/10/2016	Logged by	/:
Well	Water Strikes	Davit	Sampl	les and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description	,	
	Cable n	ercuss	n (m bgl)	ng to 9	.7m bgl. followed hv	30.60 35.00	-20.85	hods to 35	MI	UDSTONE with bands of grey sandston	e.	
Remarks	Cable p	ercuss	ion drillii	ng to 9	./m bgl, followed by	rotary oper	n hole met	nods to 35	sm bg	gı.	Final	

	D	TS	R	AEBU	RN		Moor Lane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 enquiries@dts-raeburn.co.uk			Borehole N BH2	0.
			EOTECHN	ICAL & ENVIRONMENTAL	ENGINEERIN	IG		ww	/w.dts-raeburn.co.uk	Sheet 1 of	4
Projec	ct Name:	: Whi	tehaven	E1	2964		Co-ords:		461870E - 6044093N	CP+RO	:
Locati	ion:	Pres	ton Stree	t, Whithaven, Cumbria	Э		Level:		8.25m AOD	Scale: 1:50	
Client	:	Mor	baine Ltd				Dates:		19/10/2016 - 21/10/2016	Logged by JO/JL	:
Well	Water Strikes	Sa	mples and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description		
		Depth (m b	igi) Type	Results	0.15	8 10		СС	ONCRETE		-
		0.20	D		0.10	0120		M to	IADE GROUND: brown ashy, slightly silty subrounded, fine to coarse gravel of sa	y, sandy, angular andstone,	-
		0.60	В		0.60	7.65		m M	udstone, brick, ceramic. (Some rootlets IADE GROUND: black ashy angular to su	s) Ibrounded, fine	
		0.80	D					to	coarse gravel of coal, brock and ceram	ic.	- - 1 -
		1.20	D					4.25	2.20		
		1.20	SPT	N=3 (0,1/0,1,1,1)				1.25-	-2.30 - Becoming clayey		-
		1.70	В								-
											2 -
		2.20 2.20	D SPT	N=4 (0,1/1,1,1,1)	2.30	5.95		M	IADE GROUND: soft number brown sligh	ntly sandy	
								sli	ightly gravelly clay. Gravel is angular to	subrounded,	-
		2.70	В					111	Te to medium of sandstone and brick.		-
		3.00	В		3.00	5.25	she she she	Fir	rm brownish grey PEAT.		3 -
					5.20	5.05		So tra	oft to firm grey slightly silty CLAY. (with aces of peat)	occasional	-
		3.70	В				××- ××				-
	1	3.70	D				×_×_×				4 -
		4.20	D		4.20	4.05	<u>^</u>	Fir	rm grevish brown, slightly sandy, gravel	ly, occasionally	
	•	4.20	SPT					CO	bbly CLAY. Gravel and cobbles are angu	llar to	-
	•	4.70	В					30			-
							م ، مک ۵.۵۰ م م م				5 -
		5 70									
	1	5.70			5.85	2.40		Sti	iff grev slightly sandy, slightly gravelly, o	occasionally	-
		6.00	В					CO	bbbly CLAY. Gravel and cobbles are angu	llar to	6 -
	•							50			-
		6.70	D								-
		6.70	SPT	N=40 (6,7/9,10,11,10)							7 -
											-
	•	7.50	В								-
											-
											8 -
	•										-
		0.70									-
		8.70									
	1	9.00	В								9 -
	1										
		9.70	D								-
		9.70	SPT	N=50 (9,10/14,13,11,12)					Continued on next sheet		10 -
	Cable n	ercussion d	rilling to 1	0.4m bgl. followed by	rotary one	l en hole me	thods to 3	5m ł	bgl.		
-ks		u		20, 1010WCu Dy	, opc				- 0		
emar										Final	
R											
	1										

	D	T	S				IG	Moor Lane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 enquiries@dts-raeburn.co.uk www.dts-raeburn.co.uk Sheet 2 of 4				
Projec	t Name:		Whiteh	aven	Pro E1	oject No. 2964		Co-ords:		461870E - 6044093N	Hole Type CP+RO	:
Locati	on:		Preston	Street	, Whithaven, Cumbria	3		Level:		8.25m AOD	Scale: 1:50	
Client	:		Morbai	ne Ltd				Dates:		19/10/2016 - 21/10/2016	Logged by JO/JL	/:
Well	Water Strikes		Sampl	es and	In Situ Testing	Depth (m.hgl)	Level	Legend		Stratum Description		
		Deptr	n (m bgl)	lype	Results	10.25	2.00					-
		1	0.40	SPT	0 (50 for 0mm/0 for 0mm)	10.25	-2.15		Ha Br	ard grey SANDSTONE rown grey BOULDER CLAY (drillers descr	iption)	
						11.10	-2.85		Gi	rey SANDSTONE with occasional bands i Itstone (drillers description)	of dark grey	
												18
										Continued on neutrinost		19
	Cable p	ercuss	ion drillii	l ng to 1	0.4m bgl, followed by	rotary ope	l en hole me	ethods to 3	5m l	bgl.		
Remarks				_	,						Final	

		T						Moor La	ane, '	Witton, Birmingham, B6 7HG	Borehole N	0.
	D		21	\prec	AEBU	IKN		e	+4 nauir	14 (0) 121 3445885 ries@dts-raeburn.co.uk	BH2	
			GEO	TECHNI	CAL & ENVIRONMENTAL	ENGINEERIN	IG		ww	w.dts-raeburn.co.uk	Sheet 3 of	4
Projec	t Name:		Whiteh	aven	Pr E1	oject No. 2964		Co-ords:		461870E - 6044093N	Hole Type CP+RO	:
Locati	on:		Preston	Street	, Whithaven, Cumbr	а		Level:		8.25m AOD	Scale: 1:50	
Client			Morbai	ne Ltd				Dates:		19/10/2016 - 21/10/2016	Logged by JO/JL	':
Well	Water Strikes	Donth	Sampl	es and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description		
								· · · · · · · · · · · · · · · · · · ·				-
								· · · · · · · · · · · ·				
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								· · · · · · · · · · · · · · · · · · ·				23 -
								· · · · · · · · · · · · · · · · · · ·				
												24 —
						24.80	-16.55	· · · · · · · · ·	CO de	DAL with thin bands of mudstone within escription)	n (drillers	25 —
												26 —
												-
						26.70	-18.45		Gr de	rey MUDSTONE with bands of grey sand escription)	dstone (drillers	27 —
												28 —
												29 —
										Continued on next sheet		30 -
	Cable p	ı ercuss	ion drilliı	ng to 1	ı 0.4m bgl, followed b	ı y rotary ope	n hole me	thods to 3	1. 35m b	ogl.		I
emarks				-	2.						Final	
Ā												

	DTS RAEBURN GEOTECHNICAL & ENVIRONMENTAL ENGINEERING								Moor Lane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 enquiries@dts-raeburn.co.uk www.dts-raeburn.co.uk		Borehole No. BH2 Sheet 4 of 4	
Project Name:			Whitehaven Pro		oject No. 2964		Co-ords:		461870E - 6044093N	Hole Type: CP+RO		
Location:			Preston Street, Whithaven, Cumbria					Level:	rel: 8.25m AOD S		Scale: 1:50	
Client	:		Morbaine Ltd					Dates:	s: 19/10/2016 - 21/10/2016		Logged by: JO/JL	
Well	Water Strikes	Deptł	Sampl	es and Type	In Situ Testing Results	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description	· · · · ·	
	Cable p	ercuss	ion drilli	ng to 1	0.4m bgl, followed b	35.00 y rotary ope	-26.75	ethods to 3	35m ł	End of borehole at 35.00m l	bgI	
Remarks	Fin											
		TO					Moor La	ne, Witton, Birmingham, B6 7HG	Borehole N	0.		
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	D	15	K	AEBU	KV			+44 (0) 121 3445885	BH3			
			BEOTECHN	ICAL & ENVIRONMENTAL	ENGINEERIN	IG	en	www.dts-raeburn.co.uk	Sheet 1 of	4		
				Pro	oject No.				Hole Type	:		
Projec	ct Name:	Wh	itehaven	E1	2964		Co-ords:	461851E - 6044057N	CP+RO			
Locati	ion:	Pres	ston Stree	t. Whithaven, Cumbria	9		Level:	10.00m AOD	Scale:			
							201011		1:50			
Client	:	Moi	rbaine Ltd				Dates:	24/10/2016	Logged by	/:		
	Wator		amples and	In Situ Testing	Donth	Laval			J0/JL			
Well	Strikes	Donth (m.k		Recults	(m bgl)	(m AOD)	Legend	Stratum Description				
			Jgi) Type	Nesuits			~~~~~~	CONCRETE		-		
		0.10	B		0.10	9.90		MADE GROUND: Firm brown ashy silty	gravelly and	- -		
2.52		0.30	DB		0.60	9.40		cobbly clay. Gravel is angular to subroun	ded, fine to			
		0.80	D					Coarse of sandstone, mudstone, coal and MADE GROUND: Red and black ashy, slig	htly clayey,	′ -		
	1							angular to subrounded, fine to coarse gr	avel and cobbles	1 -		
		1.20	D SPT	N=2(0.0/2.0.0.0)				of blick, sandstone, industone and coal.		-		
		1.20	511	11-2 (0,0/2,0,0,0)						-		
		1.70	В									
	1	2.00	D							2 -		
		2.20	D	N 4 /0 fee 200mm /4 fee						-		
	1	2.20	501	150mm)	2.60	7.40				-		
	1	2.70	В		2.60	7.40	××	soft light brown slightly sandy, slightly si	lty, gravelly CLAY.			
	1							sandstone and mudstone.	medium or	3 -		
	1	3.20	U				÷			-		
	1						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
	1	3.70	В		3.70	6.30		Soft dark brown organic CLAV with trace	s of peat			
	1	3.70	D		4 00	6.00	- <u>sk</u> - ska ska - sk	Soft dark brown organic CLAF with trace.	s of peat.	- 1 -		
		4.20	D		4.00	0.00	× × ×	Soft brown slightly silty CLAY		4		
	1	4.20	SPT	N=9 (0,0/2,2,2,3)			× × ×			-		
	1	4.70	В		4 75	5.25				-		
	1	-			4.75	5.25		Firm brown slightly sandy, slightly gravel	ly CLAY. Gravel is] _ :		
		5 20	U		5 20	4 80		and mudstone.	e of sandstone	5 -		
								Stiff grey slightly gravelly CLAY. Gravel is subrounded, fine to coarse with occasion	angular to nal cobbles of			
		5 70	D					sandstone and mudstone.		-		
		5170										
		6.00	В							6 -		
		6 70								-		
		6.70	SPT	N=41 (4,8/9,10,12,10)						-		
										7 -		
										-		
		7.50	В							-		
	1	7.70	SPT	50 (18,25/50 for 11mm)								
	1									8 -		
		8.20	U									
	1									-		
	1	8.70	D							:		
, .		9.00	В							9 -		
					9.30	0.70						
		9.50	D					Hard grey SANDSTONE		-		
					9.65	0.35		Grey sandy MUDSTONE (drillers descript	ion)	1		
								Continued on next sheet		10 -		
	Cabler		lrilling to (65m hgl followed by			thoda to 35	im hal		1		
S	Canie b		n ninng to s		iotary ope	in note me	ะเทบนร เป 35	лп оді.				
nar									Final			
Rer												

	D	T	S					G	Moor La	ane, +4 nquii ww	Witton, Birmingham, B6 7HG 44 (0) 121 3445885 ries@dts-raeburn.co.uk vw.dts-raeburn.co.uk	Borehole N BH3 Sheet 2 of	0.
Project	Name:		Whiteh	aven		Pro F12	ject No.		Co-ords:		461851E - 6044057N	Hole Type	:
Locatior	n:		Preston	Street	, Whithaven, Cun	nbria			Level:		10.00m AOD	Scale: 1:50	
Client:			Morbai	ne Ltd					Dates:		24/10/2016	Logged by JO/JL	:
Well	Water Strikes	Denti	Sampl	es and	In Situ Testing Results		Depth (m bgl)	Level (m AOD)	Legend		Stratum Description		
	Cable p	ercuss	ion drilli	Type	.65m bgl, followe	d by	(m bgi) 12.00	-2.00	ethods to 3	Gi de	rey SANDSTONE with bands of mudstor escription) Continued on next sheet	ne (drillers	
Remarks				וא נט א	usin ugi, ioliowe	u DY			ethous to 3		νgι.	Final	

	D	T	GEOT				IG	Moor La er	ane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 nquiries@dts-raeburn.co.uk www.dts-raeburn.co.uk	Borehole N BH3 Sheet 3 of	lo. 4
Projec	t Name:	· V	Vhiteha	ven	P	roject No. 12964		Co-ords:	461851E - 6044057N	Hole Type CP+RO	2:
Locati	on:	F	Preston S	Street	, Whithaven, Cumbr	ria		Level:	10.00m AOD	Scale: 1:50	
Client		Ν	Norbain	e Ltd				Dates:	24/10/2016	Logged by JO/JL	/:
Well	Water Strikes	Double (Sample	s and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	· · · · ·	
	Cable p	ercussio	n drillin;	g to 9	.65m bgl, followed b	29.10	-19.10	ethods to 3	COAL with thin bands of mudstone withi description)	in (drillers	21 22 22 23 23 24 24 25 26 27 28 29 30
Remarks										Final	

	D	T	S GEO				G	Moor La	ane, \ +4 nquiri ww\	Nitton, Birmingham, B6 7HG 4 (0) 121 3445885 ies@dts-raeburn.co.uk w.dts-raeburn.co.uk	Borehole N BH3 Sheet 4 of	lo. 4
Projec	t Name:		Whiteh	aven	P	roject No. 12964		Co-ords:		461851E - 6044057N	Hole Type CP+RO	:
Locati	on:		Preston	Street	, Whithaven, Cumbr	ria		Level:		10.00m AOD	Scale: 1:50	
Client	:		Morbai	ne Ltd				Dates:		24/10/2016	Logged by	/:
Well	Water Strikes		Sampl	les and	In Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Stratum Description	,	
				Type		31.30	-21.30		Gre	ey MUDSTONE with bands of sandstor scription) End of borehole at 35.00m	e (drillers	
Remarks	Cable p	ercuss	ion drilliı	ng to 9	.65m bgl, followed b	by rotary ope	en hole me	ethods to 3	35m b	gl.	Final	

	DT	SF					Moor La er	ane, Witton, I +44 (0) 12 nquiries@dts www.dts-ra	Birmingham, B6 7HG 1 3445885 s-raeburn.co.uk eburn.co.uk	Trial Pit TP1 Sheet 1	No. I of 1
Projec	t Name [.]	Whitehay	<i>i</i> en	Proje	ect No.		Co-ords:	461836.00	- 6044115.00	Date	:
		Winteria		E129	964		Level:	8.25m AOI)	19/10/2	016
Locati	on:	Preston S	Street, Whithaven	, Cumbria			Dime	ensions (m):		1:25	; ;
Client		Morbaine	e Ltd				Fina	I Depth: 4m		Logged JL	by:
Water	San	nples and In	Situ Testing	Depth	Level	Legend		St	ratum Description		
Strikes	Depth (m bg	I) Type	Results	(m bgl)	(m AOD)		MADE	GROUND · Brid	:k		
	0.50 1.00 1.50 3.00	D		0.10 0.90 1.40 2.80 4.00	8.15 7.35 6.85 5.45 4.25		MADE MADE sub-rou clinker. MADE occasio Soft ligi	GROUND : Brid GROUND : Bla inded GRAVEL GROUND : Bla mal brick fragm ht grey CLAY (A	ck sandy fine to coarse, and c sandy fine to coarse, and of brick, sandstone, concre ck clayey fine to coarse SAI ents. dium quartz SAND with occa ace deposits)	asional	2
larks	Groundwate	r encounte	ered at 3.9m bgl.							Final	5 -
Ren											

	DT	S F	RAEE	BUF	RN		Moor La	ne, Witton, Bir +44 (0) 121 quiries@dts-ra	mingham, B6 7HG 3445885 aeburn.co.uk	Trial Pit TP2	No. 2
		GEOT	ECHNICAL & ENVIRON	Droi			Colordo:	www.dts-raeb		Sheet 1	of 1
Projec	t Name:	Whitehay	/en	E12	964		Level:	401853.00 - 0 8.25m AOD	5044105.00	19/10/2	016
Locati	on.	Preston	Street Whithaver	n Cumbria			Dime	ensions (m):		Scale	e:
Loodin							Final	Depth:		1:25	bv:
Client:		Morbaine	e Ltd			1	3.	.9m		JL	~).
Water Strikes	San	nples and In	Situ Testing	Depth (m bgl)	Level (m AOD)	Legend		Strat	um Description		
	Depth (m bg	i) Type	Results	0.40	0.45		MADE C	GROUND : Concre	ete - no rebar.		-
	0.25			0.10	8.15		MADE C sub-rour	GROUND : Black : nded GRAVEL of	sandy fine to coarse ang brick, sandstone, concre	ular to te and	-
	0.25						clinker.				-
											-
				0.70	7.55						-
				0.70	7.55		MADE C occasior	ROUND : Black (nal brick fragment	clayey fine to coarse SANs.	ND with	-
	0.90	D						-			-
							8				-
				1.30	6.95		Soft ligh	t grey mottled ora	nge CLAY with occasion	al sand	
	1.50	В						. (Alluviulli)			-
						<u> </u>	-				-
							-				-
						 	-				
						E					2 -
							_				-
							-				
	2.50	D					-				-
							-				-
						E- <u>-</u>	-				-
							-				-
				3.10	5.15		- Croy fin	o to modium quor	ta CAND (Diverterress		3 -
							Gieyiin	e to medium quar	IZ SAND (River lenace o	leposits)	-
											-
	3.50	D									-
											-
				3.90	4.35			End of t	rial pit at 3.90m bgl		
											4 -
											-
											-
											-
											-
											5 -
<i>"</i>	Groundwate	r standing	at 3.7m bgl.								Ľ
Remark										Final	I

	DT						Moor La en	ne, Witton, Bir +44 (0) 121 quiries@dts-raet	mingham, B6 7HG 3445885 aeburn.co.uk	Trial Pit TP3	No. 3
				Proi	ect No		Co-ords:	461870.00 -	6044076.00	Sneet 1 Date	
Projec	t Name:	Whitehav	ven	E12	964		Level:	8.20m AOD	0044070.00	19/10/20	016
Locati	on:	Preston 9	Street Whithaven	Cumbria			Dime	nsions (m):		Scale	e:
Locati	011.	i restori e		Cumbria			Einol	Dooth:		1:25	by:
Client:		Morbaine	e Ltd					.9m		JL	by.
Water	San	nples and In	Situ Testing	Depth	Level	Legend		Strat	um Description		
Strikes	Depth (m bgl) Type	Results	(m bgi)	(m AOD)				slightly candy find to coa	rso	
	0.50 1.50 2.50	D D D		2.20	6.00		MADE C angular frequent MADE C of fine to occasion	GROUND : Black GRAVEL of brick t cobbles of brick t cobbles of brick o coarse sub-ang nal fragments of b ey sandy slightly g sub-angular to ro of grev sandyslightly g	slightly sandy fine to coa , clinker and ceramic pott and broken pots.	rse ery with	
	3.50	B	flow at 2.2m bal	3.90	4.30		sandsto	End of t	rial pit at 3.90m bgl		4
Remarks	Steady grour	ndwater in	now at 2.2m bgl.							Final	l

	DT						Moor La en	ne, Witton, B +44 (0) 121 nquiries@dts- www.dts-rae	irmingham, B6 7HG I 3445885 raeburn.co.uk eburn.co.uk	Trial Pit TP4 Sheet 1	No. I of 1
Draiaa	t Nomo:	W/bitabay		Proje	ect No.		Co-ords:	461837.00 -	- 6044107.00	Date	:
Projec	t Name:	vvnitenav	en	E129	964		Level:	8.30m AOD		19/10/20	016
Locati	on:	Preston S	Street, Whithaven,	Cumbria			Dime	ensions (m):		Scale 1:25	:
Client:		Morbaine	Ltd				Final	Depth:		Logged	by:
Water	San	nples and In	Situ Testing	Depth	Level			4111		JL	
Strikes	Depth (m bgl) Type	Results	(m bgl)	(m AOD)	Legend		Stra	atum Description		
	0.75	D		0.10	8.20 7.10 5.90		MADE (MADE of sub-rou frequen	GROUND : Cond GROUND : Black Inded GRAVEL of t cobbles of brick	rete - no rebar. k sandy fine to coarse, ang of brick, concrete and sand k, concrete and broken pip light brown, slightly sandy ium SAND with occasional sposits)	gular to stone with re.	
arks	Groundwater	r observed	l at base of Trial P	4.00 Pit (4.0m t	4.30			End of	f trial pit at 4.00m bgl		4
Rema										Final	

	DT						Moor Lane, Witton, Birmingham, B6 7HG +44 (0) 121 3445885 enquiries@dts-raeburn.co.uk www.dts-raeburn.co.uk Sheet 1 or	lo. If 1
Ducies	4 N I			Proje	ect No.		Co-ords: 461857.00 - 6044088.00 Date:	
Projec	t Name:	vvnitenav	/en	E129	964		Level: 8.40m AOD 19/10/201	16
Locati	on:	Preston \$	Street, Whithaven,	, Cumbria			Dimensions (m): Scale:	
Client:		Morbaine	e Ltd				Final Depth: 4m	y:
Water	San	nples and In	Situ Testing	Depth	Level	Legend	d Stratum Description	
Strikes	Depth (m bg	I) Type	Results	(m bgl)	(m AOD)	xxxxxx		
	0.25	D		0.10	8.30		MADE GROUND : Paving bricks MADE GROUND : Black sandy fine to coarse, angular to sub-rounded GRAVEL of brick, sandstone, slate with frequent cobbles of brick and pottery	-
	0.75	D		0.60	7.80		MADE GROUND : Black with grey patches clayey fine to coarse SAND with frequent fine to coarse gravel of brick and sandstone.	1-
	1.50	В		1.30	7.10		Soft to firm grey mottled light brown slightly sandy CLAY. (Alluvium)	2
	3.50	D		2.60	5.80		Light brown fine to medium quartz SAND with occasional clay bands. (River terrace deposits)	3
				4.00	4.40	<u>et (1925)</u>	End of trial pit at 4.00m bgl	4
Remarks	Groundwate	r seepage	at base of Trial P	it (4.0m b	gl).		Final	

	DT	SF					Moor La er	ine, Witton, Bir +44 (0) 121 (nquiries@dts-ra www.dts-raeb	mingham, B6 7HG 3445885 aeburn.co.uk urn.co.uk	Trial Pit TP6 Sheet 1	No. S of 1
Projoc	t Namo:	Whitehow	100	Proje	ect No.		Co-ords:	461852.00 - 6	6044075.00	Date	:
Projec	a name.	vvillenav	en	E129	964		Level:	8.30m AOD		19/10/20	016
Locati	on:	Preston S	Street, Whithaven,	Cumbria			Dime	ensions (m):		Scale 1:25):
Client:		Morbaine	e Ltd				Final	Depth:		Logged	by:
Water	San	nples and In	Situ Testing	Donth	Laval		· · ·	4m		JL	
Strikes	Depth (m bg	I) Type	Results	(m bgl)	(m AOD)	Legend		Stratu	um Description		
	Depth (m bg) 0.50 1.30 2.20 3.50	I) Type D D	Results	1.20 1.90 3.20 4.00	7.10 6.40 5.10 4.30		MADE osub-rou frequen	GROUND : Black s inded GRAVEL of I t cobble of brick. (I GROUND : Soft da nal fragments of b ey slightly sandy Cl ey sandy slightly g sub-angular to rou nal cobbles of gree	sandy fine to coarse ang prick, sandstone and clin Lead pipe found) ark grey slightly sandy Cl rick. LAY. (Alluvium)	Let to ker with	
Remarks	No groundwa	ater encou	intered. Derelict le	ad pipe f	ound at 0).5m bg	 .			Final	5

	DT						Moor La en	ne, Witton, +44 (0) 12 quiries@dts www.dts-ra	Birmir 21 344 s-raeb aeburr	ngham, B6 7HG 45885 purn.co.uk n.co.uk	Trial Pit TP7 Sheet 1	No. • of 1
Droioc	t Nama:	W/bitobox	(on	Proj	ect No.		Co-ords:	461903.00	- 604	4092.00	Date	:
Projec	t name.	vvnitenav	/en	E12	964		Level:	8.45m AOI	D		19/10/20	016
Locati	on:	Preston S	Street, Whithaven,	Cumbria			Dime	ensions (m):	Г		Scale 1:25	:
Client	:	Morbaine	e Ltd				Final	Depth:			Logged	by:
Water	San	ples and In	Situ Testing	Dopth	Lovol		1.	.9m			JL	
Strikes	Depth (m bgl) Type	Results	(m bgl)	(m AOD)	Legend		S	tratum	Description		
Strikes	Depth (m bgl 0.25 0.80) Type D D	Results	0.60 0.60	(m AOD) 7.85 6.55		MADE C fine to n sandsto fragmen	Si GROUND : Gra nedium, sub-ro ne and mudsto tts. (Topsoil) GROUND : Lig LS and COBBI	tratum lass ove junded one with ht brow LES of	Description r brown slightly claye to rounded GRAVEL n many rootlets and ra- rn slightly clayey sligh masonry stone (squa	y sandy of are glass tly sandy re cut	2
Remarks	No groundwa	ater encou	untered.								Final	5

Appendix 3

Soil Contamination Laboratory Test Results

(13 Pages)



DTS Raeburn Limited

Moor Lane Witton Birmingham B6 7HG

Г

For the attention of Jesse O'Keeffe

 Report No:
 B20404-2

 Issue No
 01

LABORATORY TEST REPORT

Project Nan	ne	WHITEHAVEN				
Project Nun	nber	B20404-2	Date samples received		21/10/2016	
Your Ref		E12964/1	Date written instructions receiv	red	21/10/2016	
Purchase C	order	28463/E12964/1	Date testing commenced		21/10/2016	
		Please find enclosed the res	sults as summarised belo	w		
Figure / Table	Test Quantity	ſ	Description		ISO 17025 Accredited	
D1	11	Client Specified Suite - Soil			See Report	
D2	10	PAHs (speciated) - Soil			Yes	
D3	10	TPHCWG - Soil			Yes	
D4	10	VPHCWG - Soil			Yes	
D5	8	Asbestos Screen - Soil			S/C	
D6	3	WAC Two-Stage Leachate Suite - Soil			No	
App S1 ~ Sample Descriptions - Soil App S2 ~ Deviating Samples - Soil App S3 ~ Summary of In-House Analytical Test Methods - Soil Remarks : Femarks :						
Issued by :	Stephen Lan	gman Date of Issue :	04/11/2016	Key to symbols u	used in this report	
Approved Signa G Wilson (JMD/L	tories : .aboratories Direc	S. Largreen 04/11/2016 ctor), S Langman (Laboratory Coordinator)		S/C : Testing wa	as sub-contracted	
	Unless we a	re notified to the contrary, samples will be	e disposed after a period of one r	nonth from this da	ate.	
Under	All n This re multisite accre The encl our report	The results reported relate to samp results contained in this report are provision port should not be reproduced except in f editation the testing contained in this repo- losed results remain the property of Terra if we have not received cleared funds in a tend in this report are UKAS according	bles received in the laboratory on onal unless signed by an approv ull without the written approval o rt may have been performed at a Tek Limited and we reserve the accordance with our standard tel	ly. ed signatory f the laboratory. another Terra Tek right to withdraw rms and conditions	laboratory.	
only mose		scope of UKAS	accreditation.		are outside the	
	Fe	eedback on the this report may be left via	our website www.terratek.co.uk/	contact-us		



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2142 - SI	TEDE	а ті	FK ^s	ite		WHITE	EHAVE	N													Coi	ntract No	∘ E1	2964/1
lite DTS Gre	I III III III III III IIII IIII IIII IIII	STIGATION AND LABORATO	RY SERVICES C	lient ngineer		DTS Ra	aeburn L	imited																
enBro	S	ample Identifi	cation																S	. 드				
Mn SOIL - B20404-2 01.xls	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (water soluble)	Phenol	Total Cyanide	Free Cyanide	Sulphate (acid soluble a SO4)	Sulphate (water soluble 2:1 extract) as SO4	Sulphide	Total Sulphur	Total organic carbon	Æ
						mg/kg	mg/kg	mg/kg	mg/kg	%	g/l	mg/kg	%	%										
	TP01	0.50		т	401477	58	<1	19	390	<1	<3	370	81	230	<1.0	1.5	<0.1	<1.0	0.20	~	10	0.2	17.0	8.3
	TP02	0.90		т	401480	110	<1	23	210	1	<3	51	37	66	1.2	<0.7	0.9	<1.0	0.09	~	<4	0.1	~	8.1
	TP03	0.50		т	401483	46	<1	16	770	<1	<3	190	76	130	<1.0	1.7	<0.1	<1.0	0.10	0.01	18	0.2	16.0	7.9
	TP03	2.50		т	401486	11	<1	16	19	<1	<3	22	29	49	1.1	1.7	<0.1	<1.0	0.10	0.21	56	0.3	~	6.9
	TP04	0.75		т	401489	40	<1	20	230	<1	<3	130	75	130	1.6	1.7	<0.1	<1.0	0.17	~	8	0.2	11.0	8.3
	TP04	1.50		т	401492	15	<1	21	57	1	<3	38	27	62	1.2	0.8	<0.1	<1.0	<0.02	<0.01	<4	<0.05	2.8	7.8
	TP05	0.75		т	401495	16	<1	18	92	<1	<3	25	26	60	1.3	1.4	<0.1	<1.0	0.09	<0.01	<4	<0.05	~	7.9
lab	TP05	1.50		т	401498	10	<1	32	78	<1	<3	18	25	56	<1.0	1.7	<0.1	<1.0	0.08	0.03	7	<0.05	~	8.4
Project	TP06	0.50		т	401501	40	<1	26	2,800	1	<3	110	77	140	1.0	1.9	<0.1	<1.0	0.11	0.09	<4	0.1	~	8.0
No B204	TP07	0.25		т	401505	23	<1	25	290	2	<3	140	35	260	2.2	<0.7	<0.1	<1.0	0.03	~	<4	0.1	3.5	7.6
104-2 : 04	Acc	reditation M=Mc	Terr	Limits of a Tek Analy AS N=No a	of Detection sis Method	1 S/C U	1 S/C U	1 S/C U	1 S/C U	1 S/C U	3 S/C U	1 S/C U	1 S/C U	1 S/C U	1.0 TP032 U	0.7 TP046 M	0.1 TP048 M	1.0 TP047 U	0.02 TP029 M	0.01 TP043 M	4 TP051 M	0.05 S/C N	0.1 S/C N	~ ТР019 М
V/11/2016 17:1	Originator	Checked Approve	R	ESUL	TS OF	CHE	MICA	L CO SOIL	NTA	MINA	TION	TES	TS -	^ - resi	ult expr	essed (KI on as-re	EY eceivec	l basis			₽	(Figure 1
3:38	IGH	04/11/201	m 16																					Sheet 1 of 2

Version 010 - 29/01/2009

TERI	λ τ	EK ^s	ite		WHITE	EHAVE	N													Со	ntract No	ο Ε΄	2964	/1
	JESTIGATION AND LABORATO		lient		DTS Ra	aeburn L	imited																	
,	Sampla Identifi	cation	ngineer																					
		cation	1	-														e as	ble in					
Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (water soluble	Phenol	Total Cyanide	Free Cyanide	Sulphate (acid solubl SO4)	Sulphate (water solul 2:1 extract) as SO4	Sulphide	Total Sulphur	Total organic carbon	Hd	
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	g/l	mg/kg	%	%		ļ
TP06	3.50		T	401504	~	~	~	~	~	~	~	~	~	~	~	~	~	0.02	0.01	~	<0.05	~	8.0	
Ac	creditation M=M	Terr certs U=UK	a Tek Analy AS N=No a	ysis Method	S/C U	S/C U	S/C U	S/C U	S/C U	S/C U	S/C U	S/C U	S/C U	TP032 U	TP046 M	TP048 M	TP047 U	TP029 M	TP043 M	TP051 M	S/C N	S/C N	TP019 M	
Originator	Checked Approve	^{&} ^{ed} R	ESUL	TS OF	CHE	MICA	L CO SOIL	NTA	MINA	TION	TES	TS -	^ - res	ult expr	essed (KI on as-re	EY eceived	l basis			T	K	Figure	ə 1
IGH	2. Langue 04/11/201	m 16																					Sheet 2	of 2

2142 - Suite DTS GreenBrown SOIL - B20404-2 01.xls Version 010 - 29/01/2009

Lab Project No B20404-2 : 04/11/2016 17:13:38 Moor Lane, Witton, Birmingham, B6 7HG

2150 - PA	TERR	а ті	EK	Site		WHITE	EHAVE	N													Со	ntract No	E12964	/1
Hs SOIL - B	SITE INVE	STIGATION AND LABORATO	RY SERVICES C	Client Engineer		DTS Ra	aeburn L	imited																
320404	S	ample Identifi	cation																е	Ð	•	(
1-2 01.xls	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3 - cd) pyre	Dibenzo (ah) anthracen	Benzo (ghi) perylene	Total PAHs (USEPA 16		
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg										
	TP01	0.50		Т	401477	0.96	0.09	0.23	0.30	3.91	0.86	4.10	3.53	3.64	3.16	3.80	2.17	3.70	2.41	0.86	2.64	36.3		
	TP02	0.90		т	401480	0.09	<0.05	<0.10	<0.05	0.35	<0.10	0.22	0.18	0.25	0.16	0.12	0.06	0.11	<0.10	<0.10	<0.10	1.5		
	TP03	0.50		т	401483	1.68	0.95	0.93	0.84	10.42	4.46	27.69	24.66	22.72	19.11	28.13	15.08	28.59	20.67	5.80	20.46	232.2		
	TP03	2.50		т	401486	0.10	<0.05	<0.10	<0.05	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<1.3		
	TP04	0.75		т	401489	0.75	0.22	<0.10	0.26	3.54	2.10	11.63	9.04	6.63	5.19	5.23	3.39	4.84	2.93	0.89	2.76	59.4		
	TP04	1.50		т	401492	<0.05	<0.05	<0.10	<0.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<1.3		
	TP05	0.75		т	401495	0.46	<0.05	<0.10	0.14	2.17	0.30	0.44	0.34	0.47	0.40	0.20	0.07	0.14	<0.10	<0.10	0.15	5.3		
Lab P	TP05	1.50		т	401498	0.22	0.15	<0.10	0.12	1.34	0.37	3.93	3.37	2.32	1.92	1.81	1.15	1.77	1.28	0.24	1.15	21.1		
roject N	TP06	0.50		т	401501	0.16	0.19	<0.10	0.05	1.37	0.35	2.65	2.29	1.75	1.63	2.04	1.19	1.88	1.67	0.41	1.57	19.2		
lo B204	TP07	0.25		т	401505	<0.05	<0.05	<0.10	<0.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<1.3		
04-2:04	Acc	reditation M=Mc	Ter verts U=U	Limits o ra Tek Analy (AS N=No a	of Detection sis Method	0.05 TP045 M	0.05 TP045 M	0.10 TP045 M	0.05 TP045 M	0.10 TP045 M	0.10 TP045 M	0.10 TP045 M	0.10 TP045 M	0.10 TP045 M	0.10 TP045 M	0.05 TP045 M	0.05 TP045 M	0.05 TP045 M	0.10 TP045 M	0.10 TP045 M	0.10 TP045 M	1.3 TP045 M		
/11/2016 17:1:	Originator		& ed	POLY	AROM	ATIC	HYD	ROC/ SOIL	ARBC	ONS (USEF	PA 16	i) -	^ - res	ult expr	essed	KI on as-re	EY eceived	basis			T _{ik}	Figure	e 2
3:44		04/11/201	16																				Sheet 1	of 1

2150 - PAHs SOIL - B20404-2 01.xls Version 008 - 19/06/2007

י ישטע העט 17:13:44 Moor Lane, Witton, Birmingham, B6 7HG

2210 - TE	TERR	а ті	EK ^s	ite		WHITE	EHAVE	N												Contra	ct No	E12	2964/	′1
HCWG Soil	SITE INVES	STIGATION AND LABORATO	RY SERVICES C	lient ngineer		DTS Ra	aeburn L	imited																
- R20.	S	ample Identifi	cation				:12)	:16)	:21)	35)	40)	C12)	C16)	:21)	35)	340)								ate
404-2 01 xIs	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	TPH (Aliphatics C8-C10	TPH (Aliphatics >C10-C	TPH (Aliphatics >C12-C	TPH (Aliphatics >C16-C	TPH (Aliphatics >C21-C	TPH (Aliphatics >C35-C	TPH (Aromatics >C10-C	TPH (Aromatics >C12-C	TPH (Aromatics >C16-C	TPH (Aromatics >C21-C	TPH (Aromatics >C35-C								ample received in appropri ontainer
	TP01	0.50		V	401478	mg/kg <1	mg/kg	mg/kg	mg/kg <1	mg/kg	mg/kg	mg/kg <1	mg/kg	mg/kg	тg/кд 29	mg/кg 1						—		<u>ທີ່ວັ</u> Yes
	TP02	0.00		V	401481	-1	-1	-1	-1	5	-1	-1	-1	2										Vec
	TPos	0.90		v	401461	<1	<1	<1	<1	5	<1	<1	<1	5	4	<1								res
	TP03	0.50		V	401484	<1	<1	<1	<1	5	<1	<1	<1	17	86	6								Yes
	TP03	2.50		V	401487	<1	<1	<1	<1	13	<1	<1	<1	4	33	4								Yes
	TP04	0.75		V	401490	<1	<1	<1	<1	6	<1	<1	<1	6	23	1								Yes
	TP04	1.50		V	401493	<1	<1	<1	<1	6	<1	<1	<1	3	3	<1								Yes
	TP05	0.75		v	401496	<1	<1	<1	<1	4	<1	<1	<1	3	3	1								Yes
- a-b	TP05	1.50		v	401499	<1	<1	<1	<1	6	<1	<1	<1	6	16	1								Yes
Project	TP06	0.50		v	401502	<1	<1	<1	<1	6	<1	<1	<1	13	65	5								Yes
No B204	TP07	0.25		V	401506	<1	<1	<1	<1	7	<1	<1	<1	7	37	1								Yes
104-2 : 04,		Accredita	Terr ation U=UK	Limits o a Tek Analy AS N=No a	of Detection sis Method	1 TP126 U 1 TP126 U	1 TP126 U	1 TP126 U	1 TP126 U															
/11/2016 17-13-51	Originator	Checked Approve S. Large 04/11/201	& ed			7	ГРНС	WG -	SOIL	-				^ - res	ult expr	essed o	KE on as-re	EY eceived	d basis		k	F	Figure	3 of 1

Version 010 - 18/02/2009

2215 - V	TEDD	а ті	EK	Site		WHITE	EHAVE	N											Con	itract No	• E1	2964	./1
PHCWG - Sc	I III III III III IIII IIII IIII IIII IIII	STIGATION AND LABORATOR	RY SERVICES	Client Engineer		DTS Ra	aeburn L	imited															
oil - B2	S	ample Identifie	cation							()													ate
0404-2 01.xls	Hole	Depth m	Sampl Ref	e Sample Type	Lab Sample ID	TPH (Aliphatics C5-C6)	TPH (Aliphatics C6-C8)	TPH (Aromatics C6-C7)	TPH (Aromatics C7-C8)	TPH (Aromatics C8-C10	Benzene	Ethylbenzene	m & p - Xylene	o - Xylene	Toluene	MTBE							mple received in appropri tainer
-						µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg							Sar cor
	TP01	0.50		V	401478	<10	<10	10	18	18	10	5	<10	<5	18	<5							Yes
	TP02	0.90		V	401481	<10	<10	18	20	17	18	<5	<10	<5	20	<5							Yes
	TP03	0.50		V	401484	<10	<10	30	29	17	30	<5	<10	<5	29	<5							Yes
	TP03	2.50		V	401487	<10	<10	<10	<10	<10	7	8	<10	<5	8	<5							Yes
	TP04	0.75		v	401490	<10	<10	12	34	33	12	8	17	7	34	<5							Yes
	TP04	1.50		v	401493	<10	<10	<10	<10	<10	<5	<5	<10	<5	<5	<5							Yes
	TP05	0.75		v	401496	<10	<10	<10	<10	<10	<5	<5	<10	<5	<5	<5							Yes
Lab	TP05	1.50		v	401499	<10	<10	<10	<10	11	<5	<5	<10	<5	<5	<5							Yes
Project I	TP06	0.50		V	401502	<10	<10	10	10	16	10	<5	<10	<5	10	<5							Yes
No B204	TP07	0.25		v	401506	<10	<10	<10	<10	<10	<5	<5	<10	<5	<5	<5							Yes
404-2 : 04/		Accredita	Te ation U=U	Limits o rra Tek Analy KAS N=No a	of Detection sis Method	10 TP154 M	10 TP154 M	10 TP154 M	10 TP154 M	10 TP154 M	5 TP154 M	5 TP154 M	10 TP154 M	5 TP154 M	5 TP154 M	5 TP154 M							
11/2016 17:13:	Originator DAB	Checked Approve S. Langree	& d			١	/PHC	WG -	SOII	-				^ - resi	ult expr	essed o	KEY on as-receive	ed basis		Ŧţ	ζ	Figure	∍4
53		04/11/201	6																			Sheet 1	of 1

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. مىرى 11/2016 17:13:53 Moor Lane, Witton, Birmingham, B6 7HG

2700 - A	TEDE	а т	EK ^s	ite		WHIT	EHAVEN		Contract No	E12964	/1
sheetos - Ro	I I I I I I I III I II III III III III	ESTIGATION AND LABORATO	RY SERVICES C	lient ngineer		DTS R	aeburn Limited				
0404-:	Ę	Sample Identifi	cation								
0.01 xls	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Asbestos Screen		Comments			Quantification by Phase Contrast Optical Microscopy
	TP01	0.50		т	401477	ND	None				~
	TP02	0.90		т	401480	ND	None				~
	TP03	0.50		т	401483	ND	None				~
	TP03	2.50		т	401486	ND	None				~
	TP04	0.75		т	401489	ND	None				~
	TP05	0.75		т	401495	ND	None				~
	TP06	0.50		т	401501	ND	None				~
Lah Proi	TP07	0.25		т	401505	ND	None				~
Prt Nn B204											
104-2 : 0	Ac	creditation M=Mr	Terr	Limits of a Tek Analy AS N=No a	of Detection sis Method	S/C		я́с У/С U			0.001 S/C U
4/11/2016 17	Originator	Checked Approve	& ed		ASBES	STOS	SCREEN/IDENTIFICATION	KEY ND - no asbestos detected	T	Figure	e 5
7-13:55	TGH	5. Langre 04/11/201	۰ <u>ـ</u> ا6					U - aspestos detected		Sheet 1	of 1

Version 008 - 19/06/2007

3010 - W/	TEDE) A TE		Site		WHITE	EHAVE	N													Со	ntract N	• E1	2964	/1
AC Leachate	Site Inves	atigation & Laboratory	Services (Client Engineer		DTS Ra	aeburn L	imited													All r	results ex	pressed	at L/S ra	itio 10:1
Suite -	S	Sample Identific	cation																				rbon		
B20404-2 01.xls	Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Arsenic	Barium	Cadmium	Chromium	Copper	Mercury	Molybdenum	Nickel	Lead	Antimony	Selenium	Zinc	Chloride	Fluoride	Sulphate	Dissolved Solids	Phenol	Dissolved Organic Cal		
_						mg/kg	mg/kg	mg/kg																	
	TP03	0.50		Т	401483	<0.05	0.48	<0.04	<0.1	<0.1	<0.005	0.24	<0.1	<0.2	<0.05	<0.05	<0.2	<40	5	<100	799	0.3	53		
	TP05	1.50		Т	401498	0.09	0.33	<0.04	<0.1	0.1	<0.005	0.07	<0.1	<0.2	<0.05	<0.05	<0.2	<40	8	<100	784	0.2	66		
	TP07	0.25		Т	401505	<0.05	0.17	<0.04	<0.1	<0.1	<0.005	<0.01	<0.1	<0.2	<0.05	<0.05	<0.2	<40	2	<100	231	<0.1	42		
Lab Project No B20404-				Limits of	f Detection	0.05	0.01	0.04	0.1	0.1	0.005	0.01	0.1	0.2	0.05	0.05	0.2	40	1	100	50	0.1	10		
2 : 04/-	Acc	creditation M=Mc	Ter erts U=UI	ra Tek Analy (AS N=No a	sis Method	TP156 N	TP068 N	TP080 N	TP065 N	TP035 N	TP060 N	TP162 N													
11/2016 17:14	Originator TGH	Checked Approve	& d			R	ESU	LTS C	OF LE	ACH	ATE '	TEST	ING (BS E	N 124	457-3	:2002	2)				Ŧŗ	C	Figure	∍ 6
1:04		04/11/201	6																					Sheet 1	of 1

4-2 01.xls	TERR	ра ті	EK	Site	WHITE	HAVEN			Contract No E12964/1
32040	SITE INVE	STIGATION AND LABORATO	RY SERVICES	Client	DTS Rae	burn Limite	d		
ns - E				Engineer					
criptic	S	Sample Identifi	cation						
8050 - Des	Exploratory Hole	Depth m	Samp Ref	le Sample Type	Lab Sample ID	Date Sampled	Temperature of cool box on receipt °C	Des	scription
	TP01	0.50		т	401477	19/10/16	4.8	Dark brown slightly clayey SAN gravel.	D with some fine to medium
	TP02	0.90		т	401480	19/10/16	4.8	Brown slightly sandy CLAY with	n some fine to medium gravel.
	TP03	0.50		т	401483	19/10/16	4.8	Dark grey gravelly SAND. Grav	el is fine to medium.
	TP03	2.50		т	401486	19/10/16	4.8	Grey sandy CLAY with some fir	ne to medium gravel.
	TP04	0.75		т	401489	19/10/16	4.8	Dark brown clayey SAND with s	some fine to coarse gravel.
	TP04	1.50		т	401492	19/10/16	4.8	Light brown sandy CLAY with o	ccasional fine gravel.
	TP05	0.75		т	401495	19/10/16	4.8	Brown sandy CLAY with some	fine to medium gravel.
	TP05	1.50		т	401498	19/10/16	4.8	Light brown sandy CLAY with o	ccasional fine gravel.
	TP06	0.50		т	401501	19/10/16	4.8	Reddish brown CLAY with som	e fine to medium gravel.
	TP06	3.50		т	401504	19/10/16	4.8	Grey sandy CLAY with occasion	nal fine gravel.
	TP07	0.25		т	401505	19/10/16	4.8	Brown sandy CLAY with some	fine to medium gravel.
3 17:14:06	Notes	1. Where a date	of samp	pling is not pro	vvided, the s	sample is clas	sified as	deviating.	
o B20404-2 : 04/11/2016		2. Temperatures 3. Samples are 4. Results repor	s exceed consider ted for sa	ed deviating if amples classif	ceipt may b f the incorre fied as devi	e deviating, b act sample cor ating may be	ut will be ntainer typ comprom	dependent upon the suite of tests ca pe has been used. This is indicated v ised.	rried out. vithin the report tables.
Project No	Originator	Checked Approve	& ed		LABC	RATOR	Y DE	SCRIPTIONS	Appendix S1
q	IGH	>. Langres	m						

Moor Lane, Witton, Birmingham, B6 7HG Lab Pı

Version 017 - 22/01/2015

S. Largrein 04/11/2016

Sheet 1 of 1

t-2 01.xls	TERF	ра ті	EK	Site	WHITE	HAVEN					С	ontract No	E12964	/1
32040	SITE INV	ESTIGATION AND LABORATO	RY SERVICES	Client	DTS Rae	burn Limited	ł							
LID - E			E	Ingineer										
s - SO	S	Sample Identifi	cation						(s)	ple				
8051 - Deviating samples	Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Date Sampled	Temperature on receipt °C	Sampling date has not beer provided	Sample has exceeded maxim holding time for selected test	Presence of headspace in sam vial	Poorly fitting cap or lid	Damaged Container		Preservatives used
	TP01	0.50		т	401477	19/10/16	4.8		Yes					
	TP01	0.50		V	401478	19/10/16	4.8							
	TP02	0.90		т	401480	19/10/16	4.8		Yes					
	TP02	0.90		V	401481	19/10/16	4.8							
	TP03	0.50		т	401483	19/10/16	4.8		Yes					
	TP03	0.50		V	401484	19/10/16	4.8							
	TP03	2.50		т	401486	19/10/16	4.8		Yes					
	TP03	2.50		V	401487	19/10/16	4.8							
	TP04	0.75		т	401489	19/10/16	4.8		Yes					
	TP04	0.75		V	401490	19/10/16	4.8							
	TP04	1.50		т	401492	19/10/16	4.8		Yes					
	TP04	1.50		V	401493	19/10/16	4.8							
	TP05	0.75		т	401495	19/10/16	4.8		Yes					
	TP05	0.75		V	401496	19/10/16	4.8							
7:14:10	TP05	1.50		т	401498	19/10/16	4.8		Yes					
20404-2:04/11/201617	NOTES	 Results rep Deviations Deviating r 	ported for due to us results are	samples cla: e of incorrec indicated wi	ssified as d t sample co ithin result t	eviating may b ontainer are sh ables.	be compromis nown on resul	ed. Devia t tables.	ating cond	ditions are	showr	n in the above	e table.	
ject No B	Originator	Checked Approve	& ed				CAMDI	E6	5011			T	Append	ix S2
Lab Pro	TGH	5. Longra 04/11/201	6										Sheet 1	of 2

Version 017 - 22/01/2015

4-2 01.xls	TERF	RA ТІ	EK	Site	WHITE	IAVEN					Co	ontract No	E12964	/1
B2040	SITE INVE	ESTIGATION AND LABORATOR	RY SERVICES	Client	DTS Rae	burn Limited	ł							
- ULID - I			E	Engineer										
8051 - Deviating samples - SC	Exploratory Hole	Sample Identifi Depth m	Sample Ref	Sample Type	Lab Sample ID	Date Sampled	Temperature on receipt °C	Sampling date has not been provided	Sample has exceeded maximum holding time for selected test(s)	Presence of headspace in sample vial	Poorly fitting cap or lid	Damaged Container		Preservatives used
	TP05	1.50		V	401499	19/10/16	4.8							
	TP06	0.50		т	401501	19/10/16	4.8		Yes					
	TP06	0.50		V	401502	19/10/16	4.8							
	TP06	3.50		т	401504	19/10/16	4.8		Yes					
	TP07	0.25		т	401505	19/10/16	4.8		Yes					
	TP07	0.25		V	401506	19/10/16	4.8							
4/11/2016 17:14:11	NOTES	 Results replayed and the second /li>	corted for due to us esults are	samples clar e of incorrec indicated wi	ssified as d t sample cc	eviating may b ontainer are st ables.	be compromis	ed. Devia	ting cond	ditions are s	shown	in the above	e table.	
lo B20404-2:04/		Checked	R									1		
Project N	Originator TGH	Approve S Laram	∝ d		DEV	ATING	SAMPL	ES - \$	SOIL			Tk	Append	ix S2
Lat		04/11/201	6										Sheet 2	of 2

Version 017 - 22/01/2015

4-2 01.xls	TERR	га те к	Site WHITE	HAVEN	Contract N	• E129	64/1
32040	SITE INVI	ESTIGATION AND LABORATORY SERVIC	ES Client DTS Rae	burn Limited			
Soil - I			Engineer				
st Methods :	Method Code	Re	ference	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
3100 - Te	GP001	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Preparation of soil samples for chemical analysis	Yes	Yes	N/A
ω	GP012	BS EN 12457-3: Chara Compliance test for lea materials and sludges	acterisation of Waste - aching of granular waste (two-stage batch test)	Preparation of soil samples for two-stage leachate test			Dry
	TP019	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of pH in 2.5:1 water/soil extract using pH meter.	Yes	Yes	Dry
	TP029	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of acid soluble sulfate by gravimetry.	Yes	Yes	Dry
	TP032	MAFF Book 427: The Materials: Method 8	Analysis of Agricultural	Determination of water soluble boron by colorimetry	Yes		Dry
	TP033	APHA/AWWA, 19th ec	dition: Method 5520E	Determination of Toluene Extractable Matter by soxhlet extraction.	Yes		Dry
	TP040	APHA/AWWA, 19th ec	dition: Method 3500Cr-D	Determination of hexavalent chromium by colorimetry.	Yes		Dry
	TP041	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of organic matter by titrimetry.	Yes		Dry
	TP042	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of loss on ignition at 50-440°C by gravimetry	Yes	Yes	Dry
	TP043	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of water soluble sulfate in 2:1 water/soil extract	Yes	Yes	Dry
	TP045	GACHAMJA A.M. Chro 1992 9-11 (modified)	omatography and Analysis:	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS	Yes	Yes	Dry
	TP046	MEWAM method: Phe 4-aminoantipyrine metl	nols in water and Effluents: hod	Determination of monohydric phenols by steam distillation/colorimetry	Yes	Yes	Dry
	TP047	MEWAM method: Cya	nide in Waters etc	Determination of Free Cyanide by steam distillation/colorimetry	Yes		Dry
	TP048	MEWAM method: Cya	nide in Waters etc	Determination of total cyanide by steam distillation/colorimetry.	Yes	Yes	Wet
	TP049	MEWAM method: Cya	nide in Waters etc	Determination of complex cyanide by calculation	Yes		Dry
	TP050	MEWAM method: Dete ,1985	ermination of Thiocyanate	Determination of thiocyanate by colorimetry	Yes	Yes	Dry
	TP051	USEPA Method 9030B	3	Determination of acid soluble sulfides by steam distillation/colorimetry.	Yes	Yes	Dry
	TP052	BS1881: Part 324, 198	88: Testing Concrete	Determination of elemental sulfur by soxhlet extraction and titrimetry.	Yes		Dry
~~	TP067	TNRCC Method 1005:	2001 (modified)	Determination of pentane/acetone extractable petroleum hydrocarbons (C8 - C40) by GC/FID	Yes	Yes	Wet
17:14:1:	TP072	TP072 In-house documented method		Determination of ammoniacal nitrogen by colorimetry.			Dry
0404-2:04/11/20161	Notes 1 ma 2. I 3 req 4 5. V the list	Terra Tek (Birmingham) ar terials, ie gravel, are not a Results are expressed on a The laboratory removes an juest. The laboratory records the Where a parameter cannol quality of subcontracted to ed within the Terra Tek An	e MCERTS accredited for clay, ccredited where they comprise i a dry-weight basis (samples drie y material >2mm prior to analys date of analysis of each param t be determined in house it is ou ests and the performance of the proved Subcontractors list. whir	sand & loam matrix types only, where they constitute the major component of the sample. the major component of the sample. ter at $30^{\circ}C \pm 5^{\circ}C$) except where stated. sis. The quantity and nature of any material removed from samples is eter. This information is available on request. It policy to use a UKAS/MCERTS accredited laboratory wherever pos- s subcontractor chosen. Where there is no known UKAS/MCERTS lab ch is subject to performance assessment, will be selected.	recorded and th sible. Terra Tek oratory for a par	will assume resp	e granular available on ponsibility for r, a laboratory
iject No B2	Originator	Checked & Approved	SUMMARY OF I	N-HOUSE ANALYTICAL TEST METHOD	s T i	Арре	endix S3
Lab Pro	N/A	N/A		(SOIL)		She	et 1 of 2

Version 026 - 21/05/2009

2 01.xls	TEDE) A TEV	Site WHITE	HAVEN	Contract N	• E129	64/1
20404-3		ESTIGATION AND LABORATORY SERVICES	Client DTS Ra	eburn Limited			
ioil - B2			Engineer				
est Methods S	Method Code	Refe	erence	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
3100 - T€	TP073	In-house documented m	ethod	Determination of anionic detergent (MBAS) by colorimetry			Dry
8	TP074	In-house documented m	ethod	Determination of water soluble fluoride by ion selective electrode			Dry
	TP098	BS1377, Part 3, 1990: S Purposes.	oils for Civil Engineering	Determination of acid soluble chloride by titrimetry			Dry
	TP099	BS1377, Part 3, 1990: S Purposes.	oils for Civil Engineering	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
	TP100	Wisconsin DNR Modified for Determining Gasoline	d GRO method, Method e Range Organics	Determination of Volatile Petroleum Hydrocarbons/GRO.	Yes	Yes	Wet
	TP110	USEPA Methods 8082A	& 3665A	Determination of Total & Speciated 7 PCB Congeners by GC/MS SIM	Yes	Yes	Wet
	TP114	BS1377, Part 3, 1990: S Purposes.	oils for Civil Engineering	Determination of carbonate in soil (rapid titration method)			Dry
	TP126	TNRCC Method 1006 (n	nodified)	Extracted petroleum hydrocarbons from TP067 split into aromatic and aliphatic fractions. Analysed by GC/FID.	Yes		Wet
	TP134	In-house documented m	ethod	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
	TP135	USEPA Methods 8100 8 In-house method TP045	8270D.	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS (with concentration stage)			Dry
	TP145	USEPA Methods 3550C	& 8270D	Determination of Semi-Volatile Organic Compounds by GC/MS	Yes	Yes	Wet
	TP147	USEPA Methods 8082A	& 3665A	Determination of total & speciated WHO 12 PCB Congeners by GC/MS SIM.			Wet
	TP150	USEPA Methods 8081B	& 8141B	Determination of pesticides and herbicides in soil by GC/MS SIM			Dry
	TP152	USEPA Method 556		Determination of carbonyls in soil by GC/MS.			Wet
	TP154	USEPA Method 5021. W GRO method	/isconsin DNR modified	Determination of volatiles in soil by GC/MS headspace	Yes	Selected	Wet
	TP158	USEPA Method 1671		Determination of glycols in soil by GC/FID DI			Wet
7:14:13							
320404-2:04/11/20161	Notes 1 2. 3. rec 4 5. the list	Terra Tek (Birmingham) are aterials, ie gravel, are not acc Results are expressed on a o The laboratory removes any quest. The laboratory records the d Where a parameter cannot b e quality of subcontracted tes ted within the Terra Tek Appr	MCERTS accredited for clay redited where they comprise dry-weight basis (samples dri material >2mm prior to analy ate of analysis of each parar e determined in house it is o ts and the performance of th roved Subcontractors list, wh	s and & loam matrix types only, where they constitute the major component of the sample. ed at 30°C \pm 5°C) except where stated. sis. The quantity and nature of any material removed from samples is neter. This information is available on request. ur policy to use a UKAS/MCERTS accredited laboratory wherever pos e subcontractor chosen. Where there is no known UKAS/MCERTS lab ich is subject to performance assessment, will be selected.	onent of the sam recorded and the sible. Terra Tek oratory for a par	ple. Other coars e information is will assume res ticular paramete	e granular available on ponsibility for er, a laboratory
roject No E	Originator	Checked & Approved	SUMMARY OF I	N-HOUSE ANALYTICAL TEST METHOD	s T	Арре	endix S3
ıb Pi	N/A	N/A		(3012)			

Version 026 - 21/05/2009

Moor Lane, Witton, Birmingham, B6 7HG Lab Project No B20404-2 : 04/11/2016 17-14-13

Sheet 2 of 2

Appendix 4

Geotechnical Laboratory Test Results

(24 Pages)



DTS Raeburn Limited

Moor Lane Witton Birmingham B6 7HG

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For the attention of Jesse O'Keeffe

 Report No:
 B20404

 Issue No
 01

Т

LABORATORY TEST REPORT

Project Nam	ne	WHITEHAVEN											
Project Num	nber	B20404		21/10/2016									
Your Ref		E12964/1		21/10/2016									
Purchase O	rder	28464/E12964/1		Date testing commenced		21/10/2016							
Please find enclosed the results as summarised below													
Figure / Table	/ Test Quantity Description												
1 - 5	5	Atterberg Limit				Yes							
		_											
Remarks :													
Issued by :	Stephen Lang	gman	Date of Issue :	07/11/2016	Key to symbols t	ISED IN THIS REPORT							
Annual Cine		S. Langrein			oro . resuling wa	S Sub contracted							
Approved Signal	ories : aboratorios Diros	07/11/2016 tor) S Langman (Laborate	any Coordinator)										
G WISON (SWD/L		re notified to the cont	rary samples will be	disposed after a period of one	month from this da	to							
	Officas we a	The results rep	orted relate to samp	les received in the laboratory or	nly.	ie.							
	All r This rou	esults contained in the	his report are provision	onal unless signed by an approv	ed signatory								
Under	multisite accre	editation the testing c	ontained in this repo	rt may have been performed at	another Terra Tek	laboratory.							
	The encl	osed results remain t	the property of Terra	Tek Limited and we reserve the	right to withdraw	-							
Only those r	our report	if we have not receiv	ed cleared funds in a	accordance with our standard te	rms and conditions	aro outsido tho							
only those f	esuns muica	ited in this report af	scope of UKAS	and any opinions of interpret	anons expressed								
	Fe	edback on the this re	eport may be left via	our website www.terratek.co.uk/	contact-us								



Moor Lane, Witton, Birmingham, B6 7HG Tel: +44 (0)121 344 4838 Fax: +44 (0)121 356 3599 birmingham@terratek.co.uk

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DTS Raeburn Limited

Moor Lane Witton Birmingham B6 7HG

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For the attention of Jesse O'Keeffe

 Report No:
 B20404-3

 Issue No
 01

Т

LABORATORY TEST REPORT

Project Nam	ne	WHITEHAVEN													
Project Num	nber	B20404-3		03/11/2016											
Your Ref		E12964/1		Date written instructions received											
Purchase O	rder	28468/E12964/1	28468/E12964/1 Date testing commenced												
	Please find enclosed the results as summarised below														
Figure / Table	gure / Test Description														
1	~	Summary of Geotechnical Tests													
2	3	BRE Suite - Soil				See Report									
3 - 8	6	Atterberg Limit				Yes									
9 - 10	2	Unconsolidated U	ndrained Triaxial Co	mpression		Yes									
App S1 App S2 App S3 Remarks :	~ ~ ~	Sample Descriptio Deviating Samples Summary of In-Ho	ons - Soil s - Soil ouse Analytical Test I	Methods - Soil		N/A N/A N/A									
Issued by :	Stephen Lang	gman	Date of Issue :	15/11/2016	Key to symbols u	used in this report									
		5 Loron			S/C : Testing wa	s sub-contracted									
Approved Signat	ories :	15/11/2016													
G Wilson (JMD/L	aboratories Direc	tor), S Langman (Laborate	ory Coordinator)												
	Unless we an	re notified to the cont The results rep esults contained in th	trary, samples will be ported relate to samp his report are provision	e disposed after a period of one i les received in the laboratory or onal unless signed by an approv	month from this da ily. ed signatory	ite.									
Under	I his rep multisite accre	oort should not be re editation the testing c	produced except in fi contained in this repo	uii without the written approval o ort may have been performed at a	i the laboratory. another Terra Tek	laboratory.									
0.1301	The encl	osed results remain t	the property of Terra	Tek Limited and we reserve the	right to withdraw										
	our report	if we have not receiv	ed cleared funds in a	accordance with our standard te	rms and conditions	6									
Only those r	esults indica	ted in this report ar	e UKAS accredited	and any opinions or interpret	ations expressed	are outside the									
	Er	adhack on the this r	scope of UKAS	our website www.terratek.co.uk/	contact-us										
	ге		opon may be len via	our website www.terratek.cu.uk/	00111001-03										



Moor Lane, Witton, Birmingham, B6 7HG Tel: +44 (0)121 344 4838 Fax: +44 (0)121 356 3599 birmingham@terratek.co.uk

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TERF	2 A T	EK ^s	, Site WHITEHAVEN												ntract N	• E12964/1		
	ESTIGATION AND LABORATC	^{RY SERVICES} C	lient ngineer		TS Raeburn Limited													
5	Sample Identifi	cation						Atte	erberg li	mits			Der	nsity	Тс	otal Stre	SS	
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Percentage retained 425µm	Atterberg Classification	Particle Density	Bulk	Dry	Shear Strength	Apparent Cohesion C	Angle of Shearing Resistance Phi	Other Tests
BH01	5.20		U	401909	Brown slightly sandy CLAY with	% 13	% 29	% 14	15	% 12	CL	Mg/m ³	Mg/m ³ 2.29	Mg/m ³ 2.03	kPa 87	kPa 83	1.1	
BH01	5.70		т	401910	some gravel. Gravel is fine to coarse. Grey sandy CLAY with some fine to medium gravel. Brown slightly sandy CLAY with	11	28	13	15	38	CI				90 94			BRE SD1 Suite
					much gravel. Gravel is fine to medium.													
BH02	3.70		Т	401912	Brown organic CLAY.	91	120	54	66	0	ME							
BH02	5.70		т	401913	Grey sandy CLAY with some fine to medium gravel.													BRE SD1 Suite
Notes Op of	pinions and inter UKAS accredita	oretations a tion	re outside tl	he scope	UKAS Accredited Test Y/N	Y	Y	Test d Y	etails are Y	e given on Y	the 'Note -	es on Labo Y	oratory Pr Y	ocedures Y	' sheet Y	Y	Y	See individual report sheets
Originator	Approve 5. Langue 15/11/201	ed			SUMMARY C	SUMMARY OF GEOTECHNICAL TESTS										T	Figure 1 Sheet 1 of 2	

1121 - Geotechnical Test Summary - B20404-3.xls Version 074 - 14/11/2013

Lab Project No B20404-3 : 15/11/2016 17:11:41 Moor Lane, Witton, Birmingham, B6 7HG

TERR	2 A T	EK ^s	Site WHITEHAVEN												ntract N	• E12964/1		
	ESTIGATION AND LABORATC	TIGATION AND LABORATORY SERVICES Client DTS Raeburn Limited																
5	Sample Identifi	cation	0					Atte	erberg li	mits			Der	nsity	Тс	otal Stre	SS	
Exploratory Hole	atory Depth Sample Sample Lab le m Ref Type ID		Non Engineering Sample Description	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Percentage retained 425µm	Atterberg Classification	Particle Density	Bulk	Dry	Shear Strength	Apparent Cohesion C	Angle of Shearing Resistance Phi	Other Tests		
BH02	8.70		т	401914	Brown sandy CLAY with much	% 10	% 23	% 14	9	% 33	CL	Mg/m ³	Mg/m³	Mg/m³	kPa	kPa		
BH03	4.20		т	401915	gravel. Gravel is fine to medium. Grey sandy CLAY with some fine to medium gravel.													BRE SD1 Suite
BH03	5.20		U	401916	Brown CLAY with some gravel. Gravel is fine to coarse.	13	23	13	10	9	CL		2.30	2.04	39 41 43	39	0.5	
BH03	8.20		U	401917	Brown sandy CLAY with some gravel. Gravel is fine to medium.	10	22	13	9	10	CL							
Notes Op	pinions and inter	pretations a	re outside t	he scope		V	V	Test d	etails are	given on	the 'Note	es on Labo	oratory Pr	ocedures	' sheet	V		See individual report
Originator	Approve S. Langue 15/11/201	ed			SUMMARY (UKAS Accredited Test Y/N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									Ŷ	Ť	Figure 1 Sheet 2 of 2	

1121 - Geotechnical Test Summary - B20404-3.xls Version 074 - 14/11/2013

Lab Project No B20404-3 : 15/11/2016 17:11:42 Moor Lane, Witton, Birmingham, B6 7HG

	FER	RA TI	EK	Site WHITEHAVEN														Contract No	• E1	2964/1
	SITE INVE	ESTIGATION AND LABORATOR	RY SERVICES	Client		DTS Ra	aeburn L	imited												
			E	Engineer																
	S	Sample Identifie	cation																	
	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Sulphate (acid soluble SO4)	Sulphate (water soluble 2:1 extract) as SO4	Hd	t Total Sulphur											
	BH01	5 70		т	401010	%	g/l	Q 1	%											
	BHUT	5.70			401910	0.03	0.00	0.1	0.15											
	BH02	5.70		Т	401913	0.03	0.08	8.4	0.11											
	BH03	4.20		т	401915	<0.02	0.08	7.9	0.07											
; –			Ter	Limits of Tek Analy	of Detection	0.02 TP029	0.01 TP043	0.1 TP019	0.05 S/C											
	Acc	creditation M=Mc	erts U=Uł	KAS N=No a	ccreditation	M	M	M	N											
	Originator	Checked Approve	& d							BRE	E SD1 SUITE - S	SOIL						T	C	Figure 2
	TGH	5. Languer 15/11/201	6																•	Sheet 1 of 1








Version 051 - 08/11/2013 220 - 11 PI RH02 08 Z0 T - R20404-3-401914 vis · Samina ID 401914







Version 034 - 22/11/2012



Revision 1.23 21/07/2010





4-3 01.xl	TERR	2 a ti	EK	ite	WHITE	HAVEN			Contract No	E12964/1
ins - B2040	SITE INVE	ESTIGATION AND LABORATOR	RY SERVICES C	lient ngineer	DTS Rae	burn Limiteo	Ł			
criptio	5	Sample Identifi	cation							
8050 - Des	Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Date Sampled	Temperature of cool box on receipt °C	Des	cription	
	BH01	5.70		т	401910	18/10/16	3.8	Grey sandy CLAY with some fir	ne to medium gra	vel.
	BH02	5.70		т	401913	18/10/16	3.8	Grey sandy CLAY with some fir	ne to medium gra	vel.
	BH03	4.20		Т	401915	18/10/16	3.8	Grey sandy CLAY with some fir	ne to medium gra	vel.
7:12:38										
320404-3:15/11/20161	Notes	 Where a date Temperatures Samples are of Results report 	of samplir exceeding considered ted for sam	ng is not pro g 6°C on rec I deviating if nples classif	vided, the s ceipt may b the incorre ied as devia	sample is class e deviating, bu ct sample con ating may be o	sified as ut will be ntainer typ comprom	deviating. dependent upon the suite of tests ca be has been used. This is indicated v ised.	rried out. vithin the report tabl	es.
roject No B	Originator	Checked Approve	& d		LABO	RATOR	YDE	SCRIPTIONS	T _{ik}	Appendix S1
Lab P	TGH	S. Langree 15/11/201	6							Sheet 1 of 1

Moor Lane, Witton, Birmingham, B6 7HG

Version 017 - 22/01/2015

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4-3 01.xls	TERR	<u>е</u> т А Т	EK	ite	WHITE	IAVEN					Co	ontract No	E12964	/1
B2040⁄	SITE INVE	STIGATION AND LABORATO	RY SERVICES C	lient	DTS Rae	burn Limited	t							
I- ID - E			E	ngineer										
8051 - Deviating samples - SO	S Exploratory Hole	ample Identifi Depth m	Sample Ref	Sample Type	Lab Sample ID	Date Sampled	Temperature on receipt °C	Sampling date has not been provided	Sample has exceeded maximum holding time for selected test(s)	Presence of headspace in sample vial	Poorly fitting cap or lid	Damaged Container		Preservatives used
	BH01	5.70		т	401910	18/10/16	3.8		Yes					
	BH02	5.70		т	401913	18/10/16	3.8		Yes					
	BH03	4.20		т	401915	18/10/16	3.8		Yes					
016 17:12:42	NOTES	1 Results rep 2 Deviations	ported for s	amples clas	ssified as dr	eviating may t	be compromis	ed. Devia	ting conc	litions are	shown	in the above	table.	
ct No B20404-3: 15/11/20	Originator	3 Deviating r	esults are	indicated wi	thin result t	ables.							Append	ix S2
Lab Proje	TGH	5. Langra 15/11/201	~ 6		DEV	ATING	SAMPL	ES - \$	SOIL			''k	Sheet 1	of 1

Version 017 - 22/01/2015

4-3 01.xls	TERF	RA TEK	Site WHITE	HAVEN	Contract N	• E129	64/1
32040	SITE INV	ESTIGATION AND LABORATORY SERVIC	Client DTS Rae	burn Limited			
Soil - E			Engineer				
st Methods :	Method Code	Re	ference	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
3100 - Te	GP001	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Preparation of soil samples for chemical analysis	Yes	Yes	N/A
~	GP012	BS EN 12457-3: Chara Compliance test for lea materials and sludges	acterisation of Waste - aching of granular waste (two-stage batch test)	Preparation of soil samples for two-stage leachate test			Dry
	TP019	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of pH in 2.5:1 water/soil extract using pH meter.	Yes	Yes	Dry
	TP029	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of acid soluble sulfate by gravimetry.	Yes	Yes	Dry
-	TP032	MAFF Book 427: The Materials: Method 8	Analysis of Agricultural	Determination of water soluble boron by colorimetry	Yes		Dry
	TP033	APHA/AWWA, 19th e	dition: Method 5520E	Determination of Toluene Extractable Matter by soxhlet extraction.	Yes		Dry
	TP040	APHA/AWWA, 19th e	dition: Method 3500Cr-D	Determination of hexavalent chromium by colorimetry.	Yes		Dry
	TP041	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of organic matter by titrimetry.	Yes		Dry
	TP042	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of loss on ignition at 50-440°C by gravimetry	Yes	Yes	Dry
	TP043	BS1377, Part 3, 1990: Purposes.	Soils for Civil Engineering	Determination of water soluble sulfate in 2:1 water/soil extract	Yes	Yes	Dry
	TP045	GACHAMJA A.M. Chr 1992 9-11 (modified)	omatography and Analysis:	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS	Yes	Yes	Dry
	TP046	MEWAM method: Phe 4-aminoantipyrine met	nols in water and Effluents: hod	Determination of monohydric phenols by steam distillation/colorimetry	Yes	Yes	Dry
	TP047	MEWAM method: Cya	nide in Waters etc	Determination of Free Cyanide by steam distillation/colorimetry	Yes		Dry
	TP048	MEWAM method: Cya	nide in Waters etc	Determination of total cyanide by steam distillation/colorimetry.	Yes	Yes	Wet
-	TP049	MEWAM method: Cya	nide in Waters etc	Determination of complex cyanide by calculation	Yes		Dry
-	TP050	MEWAM method: Dete ,1985	ermination of Thiocyanate	Determination of thiocyanate by colorimetry	Yes	Yes	Dry
-	TP051	USEPA Method 9030E	3	Determination of acid soluble sulfides by steam distillation/colorimetry.	Yes	Yes	Dry
	TP052	BS1881: Part 324, 198	88: Testing Concrete	Determination of elemental sulfur by soxhlet extraction and titrimetry.	Yes		Dry
.	TP067	TNRCC Method 1005:	2001 (modified)	Determination of pentane/acetone extractable petroleum hydrocarbons (C8 - C40) by GC/FID	Yes	Yes	Wet
7:12:44	TP072	In-house documented	method	Determination of ammoniacal nitrogen by colorimetry.			Dry
404-3 : 15/11/2016 1	Notes 1 ma 2. 3 rec 4 5. \ the	Ferra Tek (Birmingham) ar terials, ie gravel, are not a Results are expressed on The laboratory removes ar uest. The laboratory records the Where a parameter canno quality of subcontracted t	re MCERTS accredited for clay, accredited where they comprise is a dry-weight basis (samples drip ny material >2mm prior to analys e date of analysis of each param t be determined in house it is ou sests and the performance of the	sand & loam matrix types only, where they constitute the major component of the sample. d at 30°C ± 5°C) except where stated. sis. The quantity and nature of any material removed from samples is eter. This information is available on request. In policy to use a UKAS/MCERTS accredited laboratory wherever pos- subcontractor chosen. Where there is no known UKAS/MCERTS lab	recorded and th sible. Terra Tek	e information is will assume respectively assu	e granular available on ponsibility for er, a laboratory
lo B20.	list	ed within the Terra Tek Ap	oproved Subcontractors list, whic	ch is subject to performance assessment, will be selected.			
Project N	Originator	Approved	SUMMARY OF II	N-HOUSE ANALYTICAL TEST METHOD (SOIL)	s T	Арре	endix S3
Lab	N/A	N/A		· · ·		- She	et 1 of 2

3 01 .xls	TEDE) A TEV	Site WHITI	EHAVEN	Contract N	• E129	64/1
0404-3		ESTIGATION AND LABORATORY SERVICES					
oil - B2			Engineer				
st Methods So	Method Code	Refe	erence	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
100 - Te	TP073	In-house documented m	ethod	Determination of anionic detergent (MBAS) by colorimetry			Dry
8	TP074	In-house documented m	ethod	Determination of water soluble fluoride by ion selective electrode			Dry
	TP098	BS1377, Part 3, 1990: S Purposes.	coils for Civil Engineering	Determination of acid soluble chloride by titrimetry			Dry
	TP099	BS1377, Part 3, 1990: S Purposes.	oils for Civil Engineering	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
	TP100	Wisconsin DNR Modifie for Determining Gasolin	d GRO method, Method e Range Organics	Determination of Volatile Petroleum Hydrocarbons/GRO.	Yes	Yes	Wet
	TP110	USEPA Methods 8082A	& 3665A	Determination of Total & Speciated 7 PCB Congeners by GC/MS SIM	Yes	Yes	Wet
	TP114	BS1377, Part 3, 1990: S Purposes.	oils for Civil Engineering	Determination of carbonate in soil (rapid titration method)			Dry
	TP126	TNRCC Method 1006 (r	nodified)	Extracted petroleum hydrocarbons from TP067 split into aromatic and aliphatic fractions. Analysed by GC/FID.	Yes		Wet
	TP134	In-house documented m	ethod	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
	TP135	USEPA Methods 8100 8 In-house method TP045	& 8270D.	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS (with concentration stage)			Dry
	TP145	USEPA Methods 3550C	& 8270D	Determination of Semi-Volatile Organic Compounds by GC/MS	Yes	Yes	Wet
	TP147	USEPA Methods 8082A	& 3665A	Determination of total & speciated WHO 12 PCB Congeners by GC/MS SIM.			Wet
	TP150	USEPA Methods 8081B	& 8141B	Determination of pesticides and herbicides in soil by GC/MS SIM			Dry
	TP152	USEPA Method 556		Determination of carbonyls in soil by GC/MS.			Wet
	TP154	USEPA Method 5021. V GRO method	Visconsin DNR modified	Determination of volatiles in soil by GC/MS headspace	Yes	Selected	Wet
	TP158	USEPA Method 1671		Determination of glycols in soil by GC/FID DI			Wet
2:45							
6 17:1	Notes	Torro Tok (Pirminghom) oro	MCEPTS approximation for all	, and a loop motivity types only where they appoint to the main some	anopt of the com	uplo. Other coorr	o gropulor
11/201	n. ma 2.	aterials, ie gravel, are not acc Results are expressed on a	credited where they comprised and the comprised of the co	, said a loan matrix types only, where they constitute the major comp e the major component of the sample. ried at 30°C ± 5°C) except where stated.		pie. Other coars	
20404-3:15/	3. rec 4. 5. the list	The laboratory removes any quest. The laboratory records the d Where a parameter cannot to a quality of subcontracted test ted within the Terra Tek App	atte of analysis of each para ete of analysis of each para be determined in house it is sts and the performance of t roved Subcontractors list, w	where the quantity and nature or any material removed from samples is meter. This information is available on request. our policy to use a UKAS/MCERTS accredited laboratory wherever pos he subcontractor chosen. Where there is no known UKAS/MCERTS lab nich is subject to performance assessment, will be selected.	sible. Terra Tek	will assume res	available on ponsibility for er, a laboratory
oject No B	Originator	Checked & Approved	SUMMARY OF	IN-HOUSE ANALYTICAL TEST METHOD	s T i	Арре	endix S3
ab Pr	N/A	N/A		(SOIL)		Sho	ot 2 of 2

Sheet 2 of 2

Appendix 5

Groundwater Contamination Laboratory Test Results

(8 Pages)



DTS Raeburn Limited

Moor Lane Witton Birmingham B6 7HG

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For the attention of Jesse O'Keeffe

 Report No:
 B20404-4

 Issue No
 01

LABORATORY TEST REPORT

Project Nam	ie	WHITEHAVEN								
Project Num	ber	B20404-4		Date samples received		04/11/2016				
Your Ref		E12964/1		Date written instructions receiv	/ed	04/11/2016				
Purchase O	rder	28474/E12964/1		Date testing commenced		04/11/2016				
		Please find	enclosed the re	sults as summarised belo	w					
Figure / Table	Test Quantity		I	Description		ISO 17025 Accredited				
1	3	Client Specified S	uite - Water			See Report				
2	3	PAHs (speciated)	- Water			No				
3	3	TPHCWG - Water	r			No				
4	3	VPHCWG - Water	r			Yes				
		Deviction Comple	- Motor							
App W1	~	Deviating Samples	s - vvater	Mathada Matar		N/A				
App W2	~		buse Analytical Test	Methods - Water		N/A				
Remarks.										
Issued by :	Stephen Lan	gman	Date of Issue :	18/11/2016	Key to symbols u	used in this report				
		5 Loron			S/C : Testing wa	is sub-contracted				
Approved Signat	ories :	23/11/2016								
G Wilson (JMD/La	aboratories Direc	ctor), S Langman (Laborate	ory Coordinator)							
Under i	Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. The enclosed results remain the property of Terra Tek Limited and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions Ponly those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the									
only mose r		ateu in uns report ar	scope of UKAS	and any opinions of interpret	ations expressed	are outside the				
	Fe	eedback on the this re	eport may be left via	our website www.terratek.co.uk/	contact-us					



Moor Lane, Witton, Birmingham, B6 7HG Tel: +44 (0)121 344 4838 Fax: +44 (0)121 356 3599 birmingham@terratek.co.uk

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4140 - Su	TERF	γα τ ι	EK ^s	lite		WHITE	EHAVE	N													Co	ntract No	E1296	64/1
lite DTS Gre	IN IN IN IN SITE INV	ESTIGATION AND LABORATO	^{RY SERVICES} C	lient ngineer		DTS Ra	aeburn L	imited																
enBro	S	Sample Identifi	cation																					
wn WATER - B20404-4 01.xls	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron	Phenol	Total Cyanide	Free Cyanide	Sulphate (as SO4)	Sulphide	Sulphur	Hď		
-						µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l			
	BH01	0.00-0.00		W1	402231	2.9	0.06	0.90	0.05	0.21	1.8	9.50	14.9	3.1	<0.3	~	<0.01	<0.05	130	<0.01	<50	8.3		
	BH01	0.00-0.00		W2	402232	~	~	~	~	~	~	~	~	~	~	<0.50	~	~	~	~	~	~		
	BH02	0.00-0.00		W1	402237	12.6	0.06	1.11	0.07	0.21	1.2	9.10	17.9	15.2	<0.3	~	0.02	<0.05	114	<0.01	<50	8.5		
	BH02	0.00-0.00		W2	402238	~	~	~	~	~	~	~	~	~	~	<0.50	~	~	~	~	~	~		
	BH03	0.00-0.00		W1	402234	3.7	0.06	0.71	0.09	0.13	1.2	6.70	10.6	5.3	<0.3	~	<0.01	<0.05	152	<0.01	<50	8.5		
	BH03	0.00-0.00		W2	402235	~	~	~	~	~	~	~	~	~	~	<0.50	~	~	~	~	~	~		
Lab Project No B204																								
104-4 : 23		Accredita	Ter ation U=UK	Limits o ra Tek Analy AS N=No a	of Detection sis Method	0.2 TP156 N	0.04 TP156 N	0.04 TP156 N	0.01 TP156 N	0.08 TP156 N	0.5 TP156 N	0.03 TP156 N	0.3 TP156 N	0.3 TP156 N	0.3 TP054 U	0.50 TP113 N	0.01 TP062 U	0.05 TP061 U	4 TP065 U	0.01 TP066 U	50 S/C N	~ TP020 U		
¥/11/2016 1	Originator	Checked Approve	ed F	ESUL	TS OF	CHE	MICA			MINA	TION	TES	TS -				KI	ΞY				TL	Fig	ire 1
6:51:50	TGH	5. Langre 23/11/201	m 16				v	VATE	к														Shee	1 of 1

4140 - Suite DTS GreenBrown WATER - B20404-4 0 Version 008 - 19/06/2007

	TERR	ра ті	EK ^s	ite		WHITE	EHAVE	N													Co	ntract No	E1296	4/1
	SITE INVE	ESTIGATION AND LABORATO	RY SERVICES	lient		DTS Ra	aeburn L	imited																
;			E	ngineer	1										1	1				1				
	S	Sample Identifi	cation																ene	Je				
	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3 - cd) pyr	Dibenzo (ah) anthrace	Benzo (ghi) perylene	Polynuclear Aromatic Hydrocarbons (total)		Sample received in appropriate container
						ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l		
	BH01	0.00-0.00		W2	402232	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<160		Yes
	BH02	0.00-0.00		W2	402238	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<160		Yes
	BH03	0.00-0.00		W2	402235	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<160		Yes
			Terr	Limits of a Tek Analy	of Detection ysis Method	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	10 TP112	160 TP112		
		Accredita	ation U=UK	AS N=No a	ccreditation	Ν	N	N	N	N	N	Ν	N	N	Ν	N	N KI	N EY	Ν	Ν	Ν	N		
	Originator	Approve	∝ ed	POLY	AROM	ATIC	HYD	ROC	ARBO	ONS (USEF	PA 16	5) -									F	Figu	re 2
	DAB	5. Langue 23/11/201	۲ ا6				V	VAIE	ĸ														Sheet	1 of 1

4155 - PAHs WATER - B20404-4 01.xls Version 008 - 19/06/2007

Lab Project No B20404-4 : 23/11/2016 16:51:52 Moor Lane, Witton, Birmingham, B6 7HG

4910 - TE	TFRE	2A T	FK ^s	ite		WHITE	EHAVE	N												Cor	ntract No	ο Ε΄	2964	/1
eW DWDH0		ESTIGATION AND LABORATO	^{RY SERVICES} C	lient ngineer		DTS Ra	aeburn L	imited																
fer - R	ç	Sample Identifi	cation				12)	16)	21)	35)	40)	12)	16)	21)	35)	40)								ite
20404-4 01 vls	Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	토 TPH (Aliphatics C8-C10)	턴 TPH (Aliphatics >C10-C	턴 TPH (Aliphatics >C12-C	토 TPH (Aliphatics >C16-C	턴 TPH (Aliphatics >C21-C	턴 TPH (Aliphatics >C35-C	토 TPH (Aromatics >C10-C	턴 (Aromatics >C12-C	토 TPH (Aromatics >C16-C	턴 (Aromatics >C21-C	토 TPH (Aromatics >C35-C								Sample received in appropria container
Ī	BH03	0.00-0.00		W2	402235	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10								Yes
	BH02	0.00-0.00		W2	402238	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10								Yes
	BH01	0.00-0.00		W2	402232	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10								Yes
I ah Project No R20404-4 · 23/11		Accredita	Terr ation U=UK	Limits of a Tek Analy AS N=No a	of Detection vsis Method ccreditation	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	10 TP130 N	K	ΞΥ						
10016 16.51.54	Originator DAB	S. Langa 23/11/20	ed 16			TF	рнси	VG - \	WATE	R											Ţ	(Figure	e 3 of 1

4210 - TPHCWG Water - B20404-4 01.xls Version 010 - 18/02/2009

Lab Project No B20404-4 : 23/11/2016 16:51:54 Moor Lane, Witton, Birmingham, B6 7HG

4215 - VF	TER	2 a ti	EK	Site		WHITE	EHAVE	N												Co	ntract No	E129	64/1
HCMG - M		VESTIGATION AND LABORATO	RY SERVICES	Client Engineer		DTS Ra	aeburn L	imited															
ater -	,	Sample Identifi	cation							0													te
B20404-4 01.xls	Hole	Depth m	Sample Ref	e Sample Type	Lab Sample ID	E TPH (Aliphatics C5-C6)	TPH (Aliphatics C6-C8)	E TPH (Aromatics C6-C7)	TPH (Aromatics C7-C8)	TPH (Aromatics C8-C10)	Benzene	Ethylbenzene	e Markene Markene	δ Δ	Toluene	A MTBE							Sample received in appropria container
	BH01	0.00-0.00		V	402233	<10	<10	<10	<10	<10	<1	<1	<2	<1	<1	<1							Yes
	BH02	0.00-0.00		V	402239	<10	<10	<10	<10	<10	<1	<1	<2	<1	<1	<1							Yes
	BH03	0.00-0.00		V	402236	<10	<10	<10	<10	<10	<1	<1	<2	<1	<1	<1							Yes
Lab Project No B20404-4 : 23/11/		Accreditz	Tei ation U=UI &	Limits o rra Tek Analy KAS N=No a	of Detection ysis Method ccreditation	10 TP104 U	10 TP104 U	10 TP104 U	10 TP104 U	10 TP104 U	1 TP155 U	1 TP155 U	2 TP155 U	1 TP155 U	1 TP155 U	1 TP155 U	K	ΞΥ					
2016 16:51:56	Originator DAB	Approve 5. Largae 23/11/201	ed			VF	РНСИ	VG - \	WATE	R											T ik	Fig Shee	ure 4 t 1 of 1

Version 010 - 18/02/2009

4-4 01.xls	TERF	λ TI	EK	Site	WHITE	IAVEN					c	Contract No	E12964	/1
32040	SITE INV	ESTIGATION AND LABORATO	RY SERVICES	Client	DTS Rae	burn Limited	ł							
ER - E				Engineer										
3051 - Deviating samples - WAT	Exploratory Hole	Sample Identifi Depth m	cation Sample Ref	e Sample Type	Lab Sample ID	Date Sampled	perature on receipt °C	pling date has not been provided	<pre>has exceeded maximum g time for selected test(s)</pre>	ce of headspace in sample vial	oorly fitting cap or lid	Jamaged Container		Preservatives used
							Tem	Sam	Sample	Preseno	ď.			
	BH01	0.00-0.00		W1	402231	03/11/16	3.9		Yes					
	BH01	0.00-0.00		W2	402232	03/11/16	3.9							
	BH01	0.00-0.00		V	402233	03/11/16	3.9							
	BH02	0.00-0.00		W1	402237	03/11/16	3.9							
	BH02	0.00-0.00		W2	402238	03/11/16	3.9							
	BH02	0.00-0.00		V	402239	03/11/16	3.9							
	BH03	0.00-0.00		W1	402234	03/11/16	3.9							
	BH03	0.00-0.00		W2	402235	03/11/16	3.9							
	BH03	0.00-0.00		V	402236	03/11/16	3.9							
:51:58														
320404-4 : 23/11/2016 16	NOTES	 Results rej Deviations Deviating r 	ported for due to us results are	samples cla se of incorrec e indicated wi	ssified as d t sample cc ithin result t	eviating may t ontainer are st ables.	be compromis	ed. Devia t tables.	ting cond	ditions are	show	n in the abov	e table.	
roject No E	Originator	Checked Approve	& :d		DEVIA	TING S	AMPLE	S - W		र		T	Appendi	ix W1
Lab Pr	TGH	5. Longre 23/11/201	6										Sheet 1	of 1

Version 017 - 22/01/2015

4-4 01.xls	TERI	RA TEK	Site WHITE	HAVEN	Contract No	E12964/1
32040	SITE IN	VESTIGATION AND LABORATORY SERVICES	Client DTS Rae	burn Limited	-	
ater - I			Engineer			
Methods W	Method Code	Refe	rence	Description of Method	ISO17025 Accredited	
00 - Test	TP020	APHA/AWWA, 19th editi	on	Determination of pH using pH meter	Yes	
82(TP035	BS1377, Part 3, 1990: So Purposes.	bils for Civil Engineering	Determination of dissolved solids by gravimetry	Yes	
	TP054	MAFF Book 427: The Ar Materials: Method 8	nalysis of Agricultural	Determination of boron by colorimetry	Yes	
	TP057	APHA/AWWA, 19th editi	on: Method 3500Cr-D	Determination of hexavalent chromium by colorimetry	Yes	
	TP060	MEWAM method: Pheno 4-aminoantipyrine metho	Is in water and Effluents: d	Determination of monohydric phenols by steam distillation/colorimetry	Yes	
	TP061	MEWAM method: Cyanic	de in Waters etc	Determination of free cyanide by colorimetry	Yes	
	TP062	MEWAM method: Cyanic	de in Waters etc	Determination of total cyanide by steam distillation/colorimetry	Yes	
	TP063	MEWAM method: Cyanic	de in Waters etc	Determination of complex cyanide by calculation	Yes	
	TP064	MEWAM method: Detern ,1985	nination of Thiocyanate	Determination of thiocyanate by colorimetry	Yes	
	TP065	BS1377, Part 3, 1990: So Purposes.	bils for Civil Engineering	Determination of sulfate by gravimetry	Yes	
	TP066	MEWAM method: Sulphi Effluents, Tentative Meth	de in Waters and ods: 1983	Determination of sulfides by colorimetry	Yes	
	TP068	APHA/AWWA, 19th editi	on: Method 4500-CI-D	Determination of chlorides by titrimetry	Yes	
	TP078	APHA/AWWA, 18th editi	on: Method 4500C	Determination of ammoniacal nitrogen by colorimetry	No	
	TP079	In-house documented me	ethod	Determination of anionic detergent (MBAS) by colorimetry	No	
	TP080	APHA/AWWA, 19th editi	on: Method 4500-F-C	Determination of fluoride by ion selective electrode	Yes	
	TP081	APHA/AWWA, 19th editi	on: Method 2540D	Determination of suspended solids by gravimetry	Yes	
	TP102	APHA/AWWA, 19th editi USEPA Method 610	on: Method 6640B	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS	Yes	
	TP103	Texas Natural Resource Commission Method 100 3510C	Conservation 5 & USEPA Method	Determination of Extractable Petroleum Hydrocarbons (>C8 - C40) by GC/FID	No	
	TP104	Wisconsin DNR Modified for Determining Gasoline	GRO Method, Method Range Organics	Determination of Volatile Petroleum Hydrocarbons/BTEX/GRO (C5-C12)	Yes	
6:52:00	TP108	APHA/AWWA, 19th editi	on: Method 2510B	Determination of electrical conductivity by electrode	Yes	
<u>,</u>	Notes					

1. The laboratory records the date of analysis of each parameter. This information is available on request.

2. Where a parameter cannot be determined in house it is our policy to use a UKAS accredited laboratory wherever possible. Terra Tek will assume responsibility for the quality of subcontracted tests and the performance of the subcontractor chosen. Where there is no known UKAS laboratory for a particular parameter, a laboratory listed within the Terra Tek Approved Subcontractors list, which is subject to performance assessment, will be selected.

Version 009 - 24/06/2009

Originator N/A

r	Checked & Approved
	N/A

SUMMARY OF IN-HOUSE ANALYTICAL TEST METHODS (WATER)



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4 U1.XIS	Site STE INVESTIGATION AND LABORATORY SERVICES Client Engine		Site WHITE	HAVEN	Contract No	E12964/1
20404			Client DTS Rae	burn Limited		
ater - b.			Engineer			
Methods Wa	Method Code	Reference		Description of Method	ISO17025 Accredited	
10 - Test	TP112	USEPA Method 8100		Determination of polyaromatic hydrocarbons extractable in dichloromethane/hexane, by GC/MS	No	
82(TP113	APHA/AWWA, 19th edition: Method 6410 USEPA Method 2870D		Determination of phenol by GC/MS	No	
	TP117	APHA/AWWA, 19th edition: Method 2340B		Determination of hardness of water (calculation)	Yes	
_	TP118	APHA/AWWA, 19th edition: Method 2320B		Determination of total alkalinity by titration	Yes	
	TP128	APHA/AWWA, 19th edition: Method 6410 USEPA Method 2870D		Determination of Semi-Volatile Organic Compounds by GC/MS	Yes	
	TP130	Texas Natural Resource Conservation Commission Method 1005 & 1006		Determination of Extractable Petroleum Hydrocarbons (EPH-CWG C8-C40) by GC/FID	No	
	TP132	APHA/AWWA, 19th edition: Method 4500-NO2-B		Determination of nitrite by colorimetry	Yes	
	TP146	USEPA Methods 8082A & 3665A		Determination of Total & Speciated 7 PCB Congeners by GC/MS SIM	No	
	TP149	USEPA Methods 8082A & 3665A		Determination of Total & Speciated WHO 12 PCB Congeners by GC/MS SIM	No	
	TP155	USEPA method 5021. Wisconsin DNR modified GRO method		Determination of volatiles in water by GC/MS headspace	Yes	
	TP156	APHA/AWWA, 19th edition: Method 3030B (filtration)		Determination of dissolved metals by ICP-MS	No	
_	TP159	USEPA Method 1671		Determination of glycols in water by GC/FID DI	No	
	TP160	USEPA Method 556		Determination of formaldeyde in water by GC/MS	No	
	TP162	USEPA Method 9060A		Determination of TOC/DOC in water by HT Combustion/NDIR	No	
:52:01						
/2016 16	Notes 1. 2.	The laboratory records th Where a parameter can	e date of analysis of each	parameter. This information is available on request.	ver possible. Teri	ra Tek will assume

Version 009 - 24/06/2009

Originator Checked & Approved N/A N/A

SUMMARY OF IN-HOUSE ANALYTICAL TEST METHODS (WATER)

responsibility for the quality of subcontracted tests and the performance of the subcontractor chosen. Where there is no known UKAS laboratory for a particular parameter, a laboratory listed within the Terra Tek Approved Subcontractors list, which is subject to performance assessment, will be selected.

Sheet 2 of 2

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