

26 July 2016

Your ref:
Planning ref:
Our ref: J11145/DB/c06

Mr S Goodwill
Barratt David Wilson Southampton
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Mr Goodwill,

RE: HAVANT ROAD SITE, WARBLINGTON, EMSWORTH
UPDATED PRELIMINARY DESK STUDY & GROUND INVESTIGATION LETTER
REPORT FOR THE PROPOSED RESIDENTIAL REDEVELOPMENT

Further to instruction from BDW Southampton in 2011, we carried out desk study research and subsequently attended the above site and carried out a walkover survey and ground investigation to provide information to assist with the redevelopment of the site through the construction of 192 new houses, together with driveways, access roads, hardstanding for car parking, soft landscaping and areas of private domestic gardens.

The comments made in this letter are limited to those that can be made on the basis of the information obtained by Wilson Bailey Partnership as part of the limited research and site walkover visit carried out to date. Our comments should be viewed in the context of the limited scope of the investigation, the locations of the accessible sampling points and the range of data sources consulted, no liability can be accepted for information in other data sources. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by Wilson Bailey Partnership.

This updated letter report is based upon the findings of the work carried out in 211 although the site has remained unchanged. Return visits have been made to site during the intervening period as part of winter water monitoring and additional soakage testing, the results of which are presented separately.

Scope of Work

A desk study has been carried out in accordance with current guidelines for best practice to establish the environmental site setting and development history of the site and the surrounding area.

The desk study has been followed by a pre-purchase ground investigation to provide information to assist with the design of new foundations, pavements, soakaways and facilitate the inspection of soils and recovery of soil samples for contaminated land assessment.

The ground investigation has been carried out in a single phase and comprised a series of 6 small diameter boreholes drilled by means of an open drive percussive soil sampling rig to a depth of up to 5.45 m together with a series of 12 trial pits excavated using a rubber tyred mechanical excavator. Groundwater monitoring standpipes have been installed into each of the boreholes located across the

site to facilitate future monitoring of the groundwater levels to inform the design of the proposed redevelopment and the flood risk assessment required by the Environment Agency. Falling head borehole percolation testing has been carried out in a number of the boreholes together with shallow trial pit soakage testing to assess the potential for soil soakage and the viability of soakaways as part of the proposed redevelopment. A programme of monthly monitoring visits has been established for a 12 month period and the results of this ongoing monitoring will be reported in the form of addendum letter reports in as the programme of monitoring progresses.

The soils encountered in the boreholes were inspected by a Chartered Geologist and representative soil samples were recovered for subsequent laboratory testing for geotechnical properties and for contaminated land soil analyses to determine the presence of a wide range of potential soil contaminants. The scope of the ground investigation was restricted by the known presence of a strategic high pressure gas main that is located within the southeastern site boundary. The ground investigation was required to observe the associated exclusion zone surrounding the gas main and observed a cautious approach in this regard.

In accordance with current best practice, the findings of the desk study and ground investigation have been used to formulate a conceptual model for the site and facilitate a preliminary qualitative risk assessment and discussion of the implications of any identified issue of potential concerns with regards to ground contamination. On the basis of this assessment, the requirement for any further assessment or remedial action as part the redevelopment of this site for residential purposes has been determined.

Site Description

The site is irregular in shape with approximate maximum dimensions of 545 m by 200 m, forming an area measuring approximately 6 hectares. The site is currently in use as a number of grass paddocks that provide grazing for cattle, which are subdivided by a series of poorly maintained hedgerows and barbed wire fences. The northwestern site boundary is formed by a post and rail fence, beyond which is an area of screen planted deciduous trees and the embankment of the A27 Emsworth bypass. The embankment rises to a height of about 5m at the northern corner of the site where it forms a bridge to carry the A27 over the mainline railway that forms the northern boundary to the site. The northeastern boundary to the site is formed by an area of open land adjacent to the railway, whilst the remainder of the eastern boundary to the site is marked by hedges and fences that form the extent of adjoining residential rear gardens to the houses and bungalows that front onto Selangor Avenue to the south and east of the site. The southern boundary to the site is formed by a mature hedgerow and Havant Road beyond. Access to the site is provided by a steel five-bar gate off Selangor Avenue.

The site is sensibly level although there are a number of undulations within the ground surface and a maximum change in level of about 1.50 m across the site, with the southern part of the site being slightly raised above the remainder of the site. Within the central eastern part of the site a single dilapidated timber building is present, together with overgrown small piles of demolition rubble and possible remnants of an area of hardstanding / building ground floor slab. Within the central western part of the site there is a single large round water trough for livestock.

As part of the walkover survey no indications of the storage or use of chemicals was noted, with no indications of distressed vegetation noted. The site may be additionally located using National Grid Reference 473456,106233.

Site History

The history of the site and immediate surrounding area has been researched by reference to publicly available historical Ordnance Survey (OS) maps together with supplementary information inspected at the Havant Local Studies Library and information contained within the Archaeological Desk Based Assessment carried out by L P Archaeology on behalf of BDW Southampton (report reference

LP1211L-DBA-v.1.5, dated August 2011) and appended historical mapping records, a copy of which was provided by the Client for review.

The archaeological appraisal indicates that whilst there have been indications of various Roman, pre-Roman and Mediaeval occupations within the vicinity of the site, the site has not been developed in antiquity and is considered to hold a low potential for archaeological finds of significance. During the post Mediaeval period the Havant Road to the south of the site is considered to present a major thoroughfare with an associated slightly raised potential for archaeology.

The Ordnance Survey earliest map studied, dated 1870 indicates the site to be in use as open agricultural land within a predominantly rural setting. Subsequent maps dating up to the later 1940s indicate the site to have remained essentially unchanged, forming an area of open agricultural land between Havant to the west and Emsworth to the east. The next available map studied, dated 1952 indicates that by that time residential development of the fields to the east of the site had commenced through the construction of the initial parts of Selangor Avenue and associated houses to the east. This map also indicates a limited number of farm buildings to have been constructed within the central eastern part of the site, in the vicinity of current dilapidated timber building identified during the site walkover.

Subsequent maps indicate the ongoing development of the land to the east of the site through the 1950s and 1960s, together with the construction of additional ancillary buildings within the central eastern part of the site. The next available map studied dates from 1961 and indicates that by that time the buildings on site are likely to have been disused and construction of the A27 Emsworth Bypass is shown to have commenced to the west of the site. The next available map studied dates from 1971 and indicates that by that time the redevelopment to the east of the site and the construction of the A27 had been completed. The farm buildings shown to have been located within the central eastern part of the site are shown to have remained to the present day, although clearly they have fallen into disrepair during more recent years.

The map dating from 1966 indicates that at that time, two disused clay pits are shown to have been present within the extreme northeastern part of the site, and whilst these are not shown on previous or more recent maps of this part of the site, the locations of these pits have subsequently been developed through the construction of the A27 and houses fronting onto Selangor Avenue.

Environmental Site Setting

Information provided by the British Geological Survey indicates the site to be underlain by Aeolian Deposits 'Brickearth' overlying Head Gravel and subsequently the London Clay. The Reading Beds and subsequently the Upper Chalk are shown to be present beneath the Aeolian Deposits a short distance to the south of the site.

Information provided by the Environment Agency indicates the Aeolian Deposits to be classified as a Secondary Class A Superficial Aquifer, with the underlying London Clay not classified as a productive stratum. The site is not shown to be located within any class of Source Protection Zone associated with any licensed groundwater abstraction points, although the Inner Source Protection Zone associated with the Portsmouth Water Havant Springs abstraction points is shown to be located approximately 450 m to the southwest of the site.

Further information provided by the Environment Agency does not indicate the presence of any active or historical landfill sites or other indications of any other potentially contaminative land uses such as waste processing sites, fuel filling stations or pollution incidents have been recorded within 500 m of the site.

Information provided by Public Health England (PHE) indicates the site to be located in an area where between 1% and 3% of houses are above the action level for radon emissions, although a requirement

for the incorporation of radon protective measures as part of the construction of new buildings in this area is not stipulated.

Preliminary Conceptual Site Model Summary and Risk Assessment

The historical and current use of the site for open grazing for livestock is not considered to present a potentially contaminative history. No indicators of potential contaminative activities have been identified within the vicinity of the site.

Ground Conditions

Underlying the generally nominal thickness of topsoil present across the site, the Aeolian Deposits have been found to comprise a firm silty clay to depths of between 0.80 m and 2.20 m below ground level. These clay soils have been found to be locally desiccated with visible rootlets encountered to a depth of up to 1.20 m and desiccation indicated to a depth of at least 1.30 m below ground level. Underlying these clay soils, Head Gravel comprising a generally medium dense clayey gravel was encountered to the full depth in the trial pits, which terminated due to trial pit instability upon encountering groundwater at a maximum depth of 2.30 m below ground level.

Where proved in the deeper small diameter boreholes at depths of between 1.60 m and 3.80 m, these variably sandy and clayey gravels were found to be underlain by a fine silty sand / sandy silt which was encountered to depths of between 3.40 m and 3.70 m where proved within the central part of the site. The base of these sand soils was not however proved to a depth of up to 4.00 m below ground level across the majority of the site. Underlying the fine silty sand soils, where proved, stiff grey fissured clay of the London Clay was encountered and proved to the maximum depth of investigation at 5.45 m below ground level.

The results of laboratory index testing carried out on selected soil samples indicates the near surface silty clay soils of the Aeolian Deposits to be of medium plasticity, with the underlying clay soils of the London Clay to be of medium to high plasticity.

Groundwater was encountered within each of the boreholes and within a number of the trial pits at depths of between about 1.60 m and 2.30 m within the Head Gravel. The presence of groundwater within the Head Gravel and the underlying fine silty sand soils resulted in both the collapse of trial pits and difficulties in drilling with the collapse of boreholes and silting up of casings.

The results of the initial round of groundwater monitoring carried out as part of a proposed programme of monitoring are presented below. This table has been updated and issued as part of addendum letter reports.

Date	BH No 1	BH No 2	BH No 3	BH No 4	BH No 5	BH No 6
15/09/2011	2.96 m bgl	2.12 m bgl	2.00 m bgl	1.98 m bgl	2.32 m bgl	2.03 m bgl

No visual or olfactory indications of ground contamination were noted as part of the fieldwork phase of the ground investigation.

Foundation Design Advice

Shallow spread foundations should be viable for the support of the envisaged light to moderate foundation loads anticipated to be associated with the proposed low rise residential redevelopment of this site.

Spread foundations should be designed to found within the medium dense clayey gravel of the Head Gravel at a minimum depth of 0.90 m below ground level and designed on the basis of a net allowable bearing capacity of 125 kPa and a minimum foundation width of 0.60 m. Within the central and northern parts of the site these clayey gravel soils have been encountered at a depth of less than about 1.00 m

below ground level, although within the southern part of the site the gravel has been encountered at a depth of up to about 2.30 m below ground level, at which depth groundwater inflows have also been encountered. On this basis it is considered that foundations designed to bear within the gravel soils at depth may be both uneconomical and difficult to form within this part of the site.

Within the southern part of the site, where the increased thickness of superficial clay soils has been encountered, shallow spread foundations at a minimum depth of 1.00 m below ground level may be designed on the basis of an assumed net allowable bearing capacity of 75 kPa within the firm normally consolidated clay soils. Any such foundations designed to found within clay soils will need to be deepened in the vicinity of existing and proposed trees and National House Building Council (NHBC) guidelines should be followed in this respect; medium shrinkability clays should be assumed. In view of the apparently widespread desiccation of these near surface clay soils it would be prudent to have any foundations designed to found within clay soils inspected by a suitably qualified and experienced engineer. Further testing within the southern part of the site would also be prudent to confirm the extent of desiccation in these soils.

Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted and due allowance should be made for future growth of trees, with particular reference to the relatively dense additional planting that is proposed as part of the ecological mitigation measures. Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation; in this respect it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines.

Consideration could be given to the use of alternative foundation such as 'Insulslab' or other proprietary waffle raft foundation solutions at this site, although further investigation, testing and discussion may however be required in order for the use of alternative foundation solutions to be sanctioned by the NHBC at this site.

Excavations

Shallow excavations for services and foundations within the near surface soils are likely to remain dry and broadly stable in the short term. Groundwater is unlikely to be encountered within shallow excavations for foundations and services, although excavations below a depth of about 1.50 m may be expected to encounter groundwater that may result in excavation instability. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

Ground Floor Slabs

On the basis of apparently widespread desiccation of the near surface medium shrinkability clay soils across much of the site, proposed new buildings should be designed to incorporate suspended ground floor slabs over a void in accordance with NHBC guidelines.

As identified above, the site is within a radon affected area but radon precautions are not stipulated. This should be agreed with the Building Control officer prior to finalized design of the floor slab.

Pavement Design

Depending upon the finalised design of the development and the proposed ground levels, the formation level for hardstandings and access roads across the majority of the site is likely to be within the near surface clay soils such that pavements may be designed on the basis of an assumed California Bearing Ratio (CBR) of "about 2%". Insitu CBR testing may be of assistance in the detailed design of new pavements.

Surface Water Drainage

In view of the shallow depth to groundwater indicated by the limited programme of monitoring carried out to date, trial pit soakage testing has been carried out within the upper levels of the Head Gravel deposits to assist with the design of shallow soakaways, with supplementary borehole falling head testing carried out within a number of the small diameter boreholes to aid the selection of overall permeability rates and transmissivity for the purposes flood risk assessment, as necessary.

The results of the trial pit soakage testing within the upper levels of the Head Gravel are enclosed and indicate relatively consistent assessed soil infiltration rates of between 4 E-5 m/s and 8.4 E-5 m/s across the majority of the site, with a reduced rate of 2.5 E-6 m/s assessed within the southwestern part of the site where the depth to the base of the clay was deeper and the gravel noted as being very clayey.

Shallow soakaways may be expected to be viable at this site, although discussions should be held with the local Environment Agency office with regards to the depth below the base of any shallow soakaway to winter ground water levels, once the results of the groundwater monitoring programme are available.

The results of the borehole falling head tests carried out in a number of the boreholes indicate assessed soil infiltration rates of in excess of 5 E-4 m/s with the water levels in the boreholes falling to the level of groundwater within less than 25 seconds.

Effect of Sulphates

Chemical analyses of selected soil samples have revealed generally low concentrations of soluble sulphate, corresponding to Class DS-1 AC-1 of Table 2 of BRE Special Digest 1: SD1 Part 1 (August 2001). The guidelines contained in the above digest should be followed in the design of foundation concrete.

Potable Water Supply

The requirement for protection of underground sections of potable water supplies will need to be confirmed through discussions with the proposed statutory provider of mains water to the site, although precautions are not likely to be required for the development at this site.

Soil Contamination Test Results

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.

The results of comprehensive laboratory analyses carried out by an MCERTS accredited laboratory on a limited number of soil samples recovered from this site are enclosed. The significance of the measured concentrations of any chemicals of concern has therefore been assessed in relation to the available Category 4 Screening Levels for the residential with plant uptake land use scenario together with the revised and updated values that have been adopted by the Chartered Institute of Environmental Health (CIEH)¹. Whilst the values that have been adopted by the CIEH are not statutory, they are widely accepted as providing a suitable initial screening value against which measured concentrations of potential contaminants can be assessed to determine the requirement for site specific quantitative risk assessment.

From a review of the enclosed results it is apparent that elevated concentrations of a wide range of potential soil contaminants have not been detected within the selected representative soil samples submitted to laboratory analyses.

¹ The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition) July 2009.

Contaminated Land Discussion

The historical and current use of the site as open agricultural land and grazing is not considered to present a potentially contaminative history or current use and the walkover survey has not revealed any signs of storage or use of potentially contaminative chemicals and no indications of distressed vegetation were noted.

The ground investigation carried out to date has not indicated the presence of elevated concentrations of a wide range of potential contaminants, and whilst unlikely, it is conceivable that localised pockets of contamination could be present. It is therefore considered that the ground works for the proposed redevelopment at this site should be carried out under a geo-environmental watching brief in order that should any suspicious or contaminated soils be encountered, they can be appropriately investigated by a geo-environmental engineer and appropriately dealt with in consultation with the regulatory authorities.

Site workers should be made aware of the site history and the potential for contamination to be present and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE² and CIRIA³ and the requirements of the Local Authority Environmental Health Officer (EHO).

Further work

Further geotechnical focused ground investigation has been carried out together with additional monitoring of the groundwater levels during winter months and additional soakage testing following on from the findings of the ground investigation works carried out in 2011.

As part of the detailed design of the proposed residential development scheme further work may also be required and it is considered that as part of any such further work, additional soil contamination testing should be considered in order to update the findings of the work carried out to date, although it is considered that the site presents a low risk of ground contamination.

We trust that this letter provides sufficient information although please do not hesitate to contact me should you have any queries or questions.

Yours sincerely
Wilson Bailey Partnership

Dominic Brightman
BSc MSc DIC FGS CGeol ARSM
Principal Engineer

² HSE (1992) HS(G)66 Protection of workers and the general public during the development of contaminated land HMSO

³ CIRIA (1996) A guide for safe working on contaminated site Report 132, Construction Industry Research & Information Association

Conveyancing Department

Wilson Bailey Partnership
Hollyhead House, FORGE FARM YARD,
SALISBURY/COMPTON CHAMBERLAYNE, SP3 5DS

Groundsure Reference: GS-3193672
Your Reference: havant_road
Report Date: 26 Jul 2016
Report Delivery Method: **xml**

Client Email: dominic.brightman@wilson-bailey.co.uk

Groundsure Radon Check

Address: Land at Havant Road, EMSWORTH, PO10 7LR

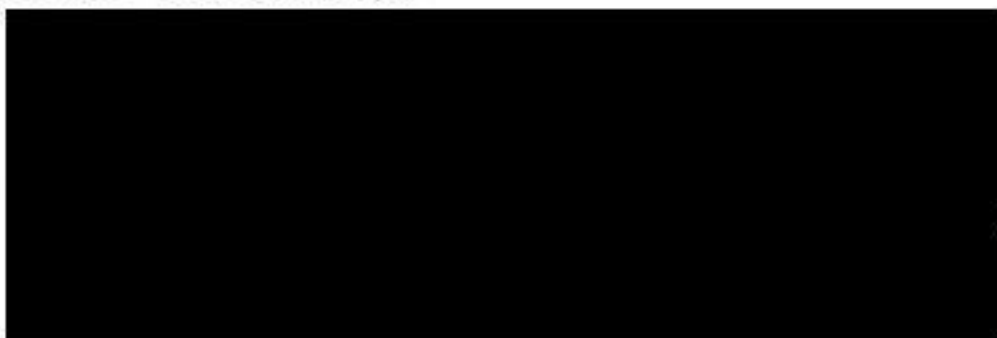
Dear Sir/Madam,

Thank you for placing your order with Groundsure.

Please find enclosed the Groundsure Radon Check as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Radon Check

Groundsure Radon Check

Address: Land at Havant Road, EMSWORTH, PO10 7LR

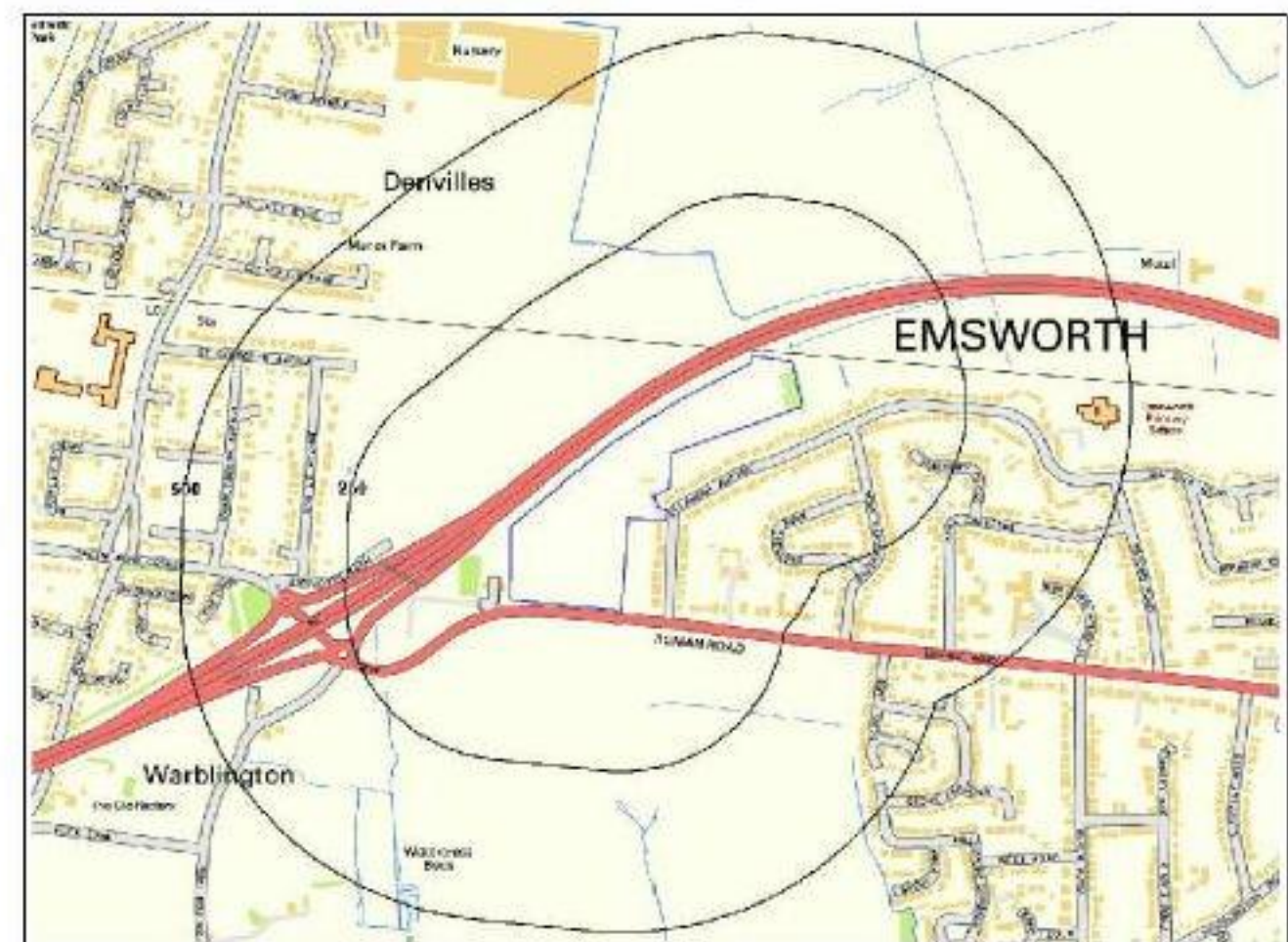
Date: 26 Jul 2016

Groundsure Reference: GS-3193672

Your Reference: havant_road

Grid Reference: 473433,106118

Client: Wilson Bailey Partnership



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1. Residential Radon Potential Result

1.1 Is the property in a Radon Affected Area?

The information in this section provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as *CON29 standard Enquiry of Local Authority; 3.13 Radon Gas: Location of the Property in a Radon Affected Area*.

Question: Is the property in a Radon Affected Area as defined by Public Health England(PHE) and if so what percentage of homes are above the Action Level?

Answer: The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

1.2 Are Radon Protective Measures required?

The information in this section will detail the level of protection required for new dwellings under as described in the latest Building Research Establishment guidance on radon protective measures for new dwellings. This may include extensions to the property.

Question: Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in either publications BR211 (England and Wales) or BR376 (Scotland) by the Building Research Establishment?

Answer: No Radon Protective Measures are necessary.

1.3 Combined Radon Guidance

Radon is a colourless, odourless radioactive gas which is present in all areas of the United Kingdom, usually at levels that pose a negligible risk to homebuyers. However, in some areas levels of radon are much higher than in others, and in these cases it can pose a health risk. The data supplied by the Public Health England (PHE) and the British Geological Survey (BGS) is not able to determine exact Radon levels, as this information can only be obtained through site-specific, in-situ testing. As 1-3% of properties in the area may be radon affected the PHE recommend carrying out a site-specific radon assessment. This costs £49.80 including VAT and the results are confidential to the client. Please contact the PHE (01235 831 600) for further information and advice.

If planning on building an extension or a new build property, no Radon Protective Measures are required.

1.4 Further details on Radon

Radon is a naturally occurring radioactive gas, which enters buildings from the ground. Outdoors, it is diluted to very low levels. However, in some cases the radon level indoors can build up to high concentrations. In such cases, it does pose a serious risk to health. Exposure to high concentrations increases the risk of lung cancer. Public Health England recommends that radon levels should be reduced in homes where the annual average is at or above 200 becquerels per cubic metre (200 Bq m⁻³). This is termed the Action Level. Public Health England defines Radon Affected Areas as those with 1% chance or more of a house having a radon concentration at or above the Action Level of 200 Bq m⁻³.

The joint PHE-BGS digital Radon Potential Dataset used in this report provides the current definitive map of Radon Affected Areas in England and Wales.

Indoor radon levels can usually be substantially reduced at a cost comparable to many home improvements, such as replacing carpets. Details of methods of reducing radon levels are given on the Building Research Establishment Website. <http://www.bre.co.uk/radon/index.html>

2. Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com



Local Authority - Havant Borough Council.
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9247 4174

British Geological Survey Enquiries
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Tel: 0115 936 3143. Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general
geological enquiries



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[https://www.gov.uk/government/organisations/
public-health-england](https://www.gov.uk/government/organisations/public-health-england)
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This report is produced by Groundsure Ltd, whose correspondence address is Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ (Tel: 08444 159 000, Fax: 01273 763569, Email: info@4c.groundsure.com). Groundsure's registered address is Greater London House, Hampstead Road, London NW1 7EJ. Registration Number: 3421028. VAT Number 486 4004 42.

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- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

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- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
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- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
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If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if they find that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

COMPLAINTS PROCEDURE

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

Complaints should be sent to: Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ. Tel: 08444 159 000. Email: info@4C.groundsure.com

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with their final decision.

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with Groundsure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to Groundsure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

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"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

"Services" means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested Groundsure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from Groundsure and on the website (www.Groundsure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

- (i) the Beneficiary,
- (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),
- (iv) the first purchaser or first tenant of the Site, and
- (v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

- (i) full payment of all relevant Fees and
- (ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

- (i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;
- (ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;
- (iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);
- (iv) not combine the Services with or incorporate such Services into any other information data or service;
- (v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

- (i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;
- (ii) any use made of the Reports, Services, Materials or any part of them; and
- (iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

- (i) loss of profits;
- (ii) loss of business;
- (iii) depletion of goodwill and/or similar losses;
- (iv) loss of anticipated savings;
- (v) loss of goods;
- (vi) loss of contract;
- (vii) loss of use;
- (viii) loss or corruption of data or information;
- (ix) business interruption;
- (x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;
- (xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;
- (xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;
- (xiii) loss or damage to a computer, software, modem, telephone or other property; and
- (xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

- (i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or
- (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
- (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
- (iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

- (i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and
- (ii) the Reports and/or Mapping provided under this Contract are
 - (a) supplied to the Client's specification(s) and in any event
 - (b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

- (i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and
- (ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

- (i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;
- (ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and
- (iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner. In the event you are not satisfied with Groundsure's complaints handling process or you are unable to resolve the complaint, at your discretion you may refer the complaint to The Property Ombudsman Scheme at the following URL/email: website www.tpos.co.uk or email: admin@tpos.co.uk

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

© Groundsure Limited June 2013

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

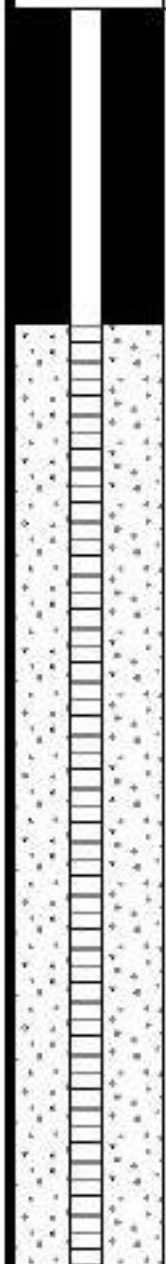
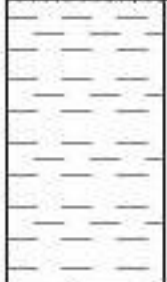
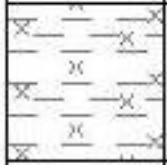
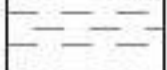
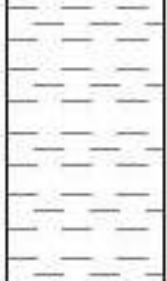
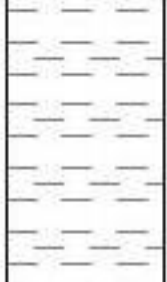
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 Scale
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Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	D		0.20			TOPSOIL	
		0.50	D					Firm orange-brown sandy silty CLAY - desiccated	
		1.00	SPT	N=10 (1,2/ 2,2,3,3)	1.10			Firm pale green and orange-brown mottled silty CLAY with occasional fine to medium flint gravel	1
		1.50	D		1.60			Loose orange-brown silty SAND with fine flint gravel	
		2.00	SPT	N=8 (5,4/ 3,2,2,1)					2
		3.00	SPT	N=8 (1,1/ 1,2,2,3)					3
					4.00				
								End of Borehole at 4.00 m	4
									5
									6
									7
									8
									9
		Type	Results						

Remarks: Ground water at 1.60 m. Standpipe installed with a response zone 1.00 m to 4.00 m.

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

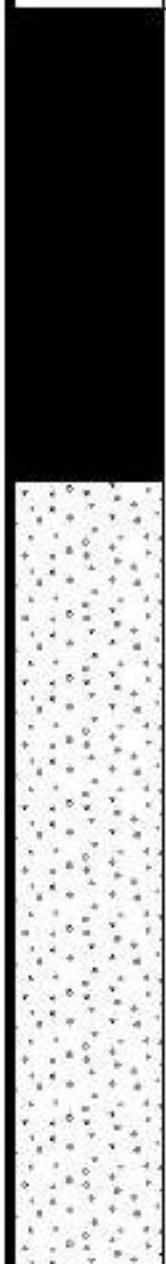
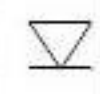
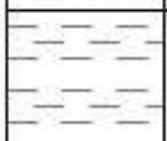
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 Scale
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Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.30			TOPSOIL	
		0.60	D					Stiff brown sandy CLAY with abundant roots and rootlets and occasional flint and gravel - desiccated	
		1.00	SPT	N=28 (5,6/8,8,6,6)	0.90			Firm orange-brown sandy firm CLAY with flint gravel	1
		1.20	D						
		2.00	SPT	N=4 (1,1/1,1,1,1)	1.70			Loose yellowish brown silty fine SAND	2
		2.00	D						
		3.00	SPT	N=8 (1,1/2,1,2,3)					3
		3.50	D		3.40			Firm becoming stiff green fissured clay with occasional fine shell fragments	
					4.00				4
								End of Borehole at 4.00 m	

Remarks: Ground water encountered at 1.70 m. Standpipe installed with a response zone from 1 m to 4 m.

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

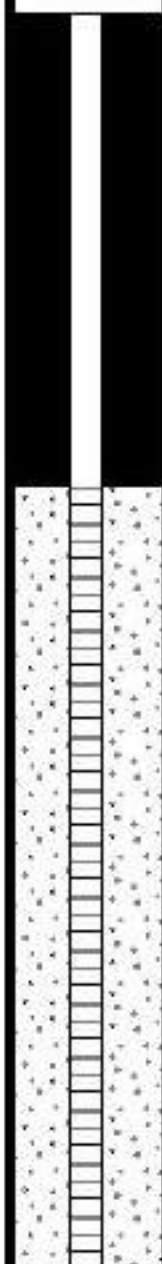
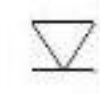
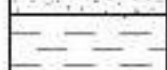
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Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	D		0.40		TOPSOIL		
		0.50	D						
		1.00	SPT		N=11	0.80		Firm orange-brown sandy CLAY with flint gravel	1
		1.00	D	(1,1/ 2,1,3,5)	1.30			Soft pale grey and pale orange-brown silty CLAY with occasional fine chalk fragments	
		1.50	D		1.90			Loose becoming medium dense pale grey yellowish brown silty fine SAND	2
		2.00	SPT	N=8					
		2.00	D	(1,1/ 2,2,2,2)					
		3.00	SPT	N=10					
				(3,4/ 3,3,2,2)					
		4.00	D		3.80		Firm dark bluish grey CLAY	4	
			4.00	End of Borehole at 4.00 m					
								5	
								6	
								7	
								8	
								9	
		Type	Results						

Remarks: Ground water encountered at 1.30 m. Standpipe installed with a response zone from 1.00 m to 4.00 m. Falling head percolation testing carried out in borehole - results reported separately.

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

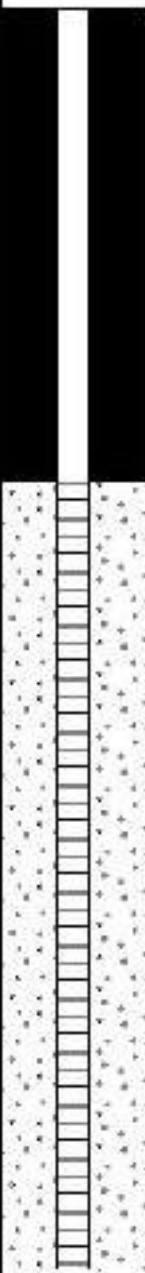
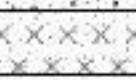
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 Scale
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Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			TOPSOIL	
		0.60	D					Firm pale brown sandy CALY with scattered fine flint gravel	
		1.00	SPT	N=20 (4,5/ 5,5,5,5)	1.00				1
		1.20	D					Medium dense brown clayey SAND with fine flint gravel	
		2.00	SPT	N=8 (2,2/ 2,2,2,2)	2.30				2
		2.00	D						
		3.00	SPT	N=6 (1,1/ 1,1,1,3)					3
		3.00	D					Loose orange-brown sandy GRAVEL	
		4.00	D		3.80				
					4.00			Soft pale brown yellowish brown fine sandy SILT	4
End of Borehole at 4.00 m									
									5
									6
									7
									8
									9

Remarks: Ground water encountered at 2.10 m rising to 2.30 m. Standpipe installed with a response zone from 1.00 m to 4.00 m.

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

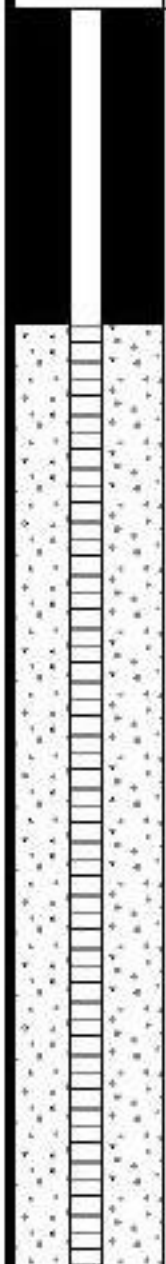
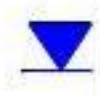
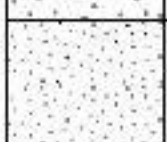
Level: -

 Scale
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Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	D		0.45			TOPSOIL	1
		0.50	D					Stiff becoming firm orange-brown silty sandy CLAY with occasional fine flint gravel	
		0.90	D					desiccated with rootlets to 1.10 m	
		1.00	SPT	N=20 (2,2/ 2,4,6,8)	1.60			Orange-brown clayey sandy GRAVEL	2
		1.30	D						
		1.80	D						
		2.00	SPT	N=4 (2,2/ 1,1,1,1)	2.00			Loose orange-brown and yellow brown sandy silty GRAVEL	
		2.50	D						
		3.00	SPT	N=4 (1,1/ 1,1,1,1)					
		3.60			3.60			Pale yellow brown silty fine SAND	4
		4.00	D					End of Borehole at 4.00 m	
			Type	Results					

Remarks: Ground water encountered at 2.50 m . Standpipe insalled with a response zone from 1.00 m to 4.00 m.

Project Name
 Havant Road Site

 Project No.
 J11145

Co-ords: -

 Hole Type
 WLS

Location: Havant Road, Warblington, Emsworth

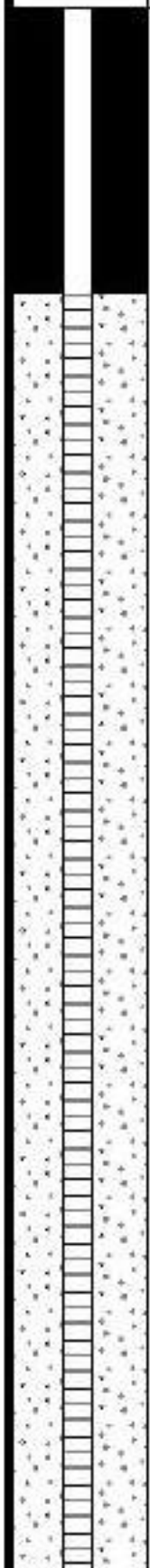
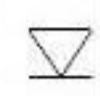
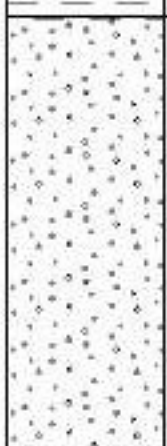
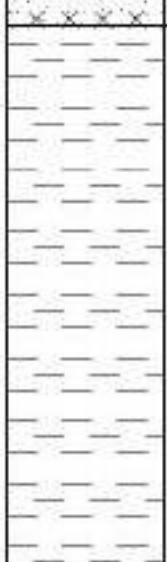
Level: -

 Scale
 1:50

Client: BDW Southampton

Dates: 23/08/2011

 Logged By
 DB

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	D		0.20			TOPSOIL	
		0.50	D		0.70			Firm soft pale orange-brown silty sandy CLAY with scatterd flint gravel	
		1.00	SPT	N=23 (5,5/ 5,6,6,6)				Medium dense orange brown very clayey sandy GRAVEL	1
		1.00	D						
		2.00	SPT	N=5 (2,1/ 1,1,1,2)	2.10			Loose becoming medium dense orange-brown sandy SILT	2
		2.50	D						
		3.00	SPT	N=18 (4,5/ 5,6,4,3)	3.70			Firm becoming stiff bluish grey fissured CLAY	3
		4.00	SPT	N=12 (2,2/ 3,3,3,3)					4
		4.00	D						
		5.00	SPT	N=17 (3,3/ 4,4,4,5)	5.45				5
								End of Borehole at 5.45 m	6
									7
									8
									9

Remarks: Ground water encountered at 2.00 m. Standpipe insalled with a response zone from 1.00 m to 6.00 m.

Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

Depth
2.30m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
						TOPSOIL	
0.50	D		0.30			Firm brown sandy CLAY with abundant rootlets	
1.05	D					desiccated to 0.80 m	1
1.50	D					rootlets to 1.30 m	
2.00	D		1.80			Firm brown sandy CLAY with abundant flint gravel	
			2.00			Orange brown clayey flint GRAVEL	2
			2.30			Trialpit Complete at 2.30 m	
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage tests carried out - test results reported seperately.

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

Depth
2.20m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.25			TOPSOIL	
0.50	D					Firm locally stiff sark brown sandy CLAY -	
1.00	D					desiccated to 0.80 m	1
						rootlets to 1.00 m	
1.50	D		1.60			Orange brown and grey sandy clayey GRAVEL	2
			2.20			Trialpit Complete at 2.20 m	3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable. Soakage testing carried out - results reported seperately

Groundwater: Groundwater encountered at 2.20 m



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

Depth
1.30m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL	
0.50	D					Stif dark orange-brown sandy CLAY with rootlets - desiccated	
			0.80				
1.00	B					Orange-brown clayey sandy flint GRAVEL	1
			1.30				
						Trialpit Complete at 1.30 m	
							2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excvator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage testing carried out - results reported seperately

Groundwater: Not encountered



Project Name Havant Road Site	Project No. J11145	Co-ords: - Level: -	Date 15/09/2011
Location: Havant Road, Warblington, Emsworth		Dimensions: - Depth 1.30m 	Scale 1:25
Client: BDW Southampton			Logged By DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.50	D		0.30			TOPSOIL	
						Stif brown and orange-brown sandy CLAY with rootlets - dessicated	
1.00	D		1.00			Orange-brown sandy clayey GRAVEL	1
			1.30			Trialpit Complete at 1.30 m	
							2
							3
							4

Remarks:	Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage testing carried out - results reported seperately
----------	--

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

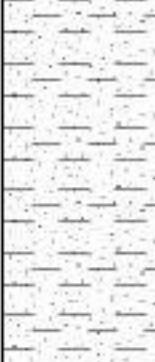
Depth
1.40m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL	
0.50	D					Stiff brown sandy CLAY	
1.00	D		1.10			rootlets to 0.80 m desiccated to 0.90 m	1
1.30	B		1.40			Orange-brown sandy clayey GRAVEL	
						Trialpit Complete at 1.40 m	
							2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage testing carried out - results reported seperatley

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

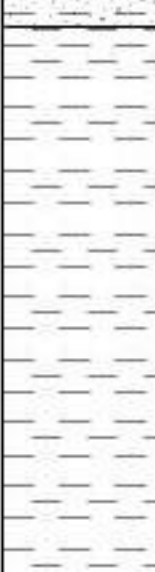
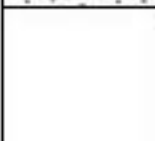
Depth
2.00m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.25			TOPSOIL	
0.70	D					Stiff dark orange-brown sandy CLAY with rootlets - dessicated	
1.00	D		0.90			Stff pale grey CLAY with occasional gravel and rootlets - dessictaed	1
1.50	D						
			1.80			Ornage-brown clayey sandy flint GRAVEL	
			2.00			Trialpit Complete at 2.00 m	2
							3
							4

Remarks: Trial pit excavated sing a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage testing carried out - results reported seperately.

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

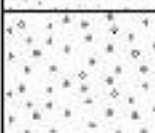
Depth
1.30m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
1.00	D		0.20			TOPSOIL	
						Stiff dark orange-brown sandy CLAY	1
			1.10			Brown sandy GRAVEL	
			1.30			Trialpit Complete at 1.30 m	2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable.

Groundwater: Not encountered



Project Name
 Havant Road Site

 Project No.
 J11145

 Co-ords: -
 Level: -

 Date
 15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

 Depth
 2.30m

 Scale
 1:25

Client: BDW Southampton

 Logged By
 DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.50	D		0.30			TOPSOIL	
						Stiff brown sandy CLAY with rootlets - dessicated to full depth	
			0.80			Brown and dark orange-brown clayey sandy GRAVEL	1
			2.30			Trialpit Complete at 2.30 m	2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable to groundwater at 2 m, collapsed below.

Groundwater: Groundwater encountered at 2.00 m.



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

Depth
1.50m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10	D		0.30			TOPSOIL	
0.50	D					Stiff brown sandy CLAY with rootlets - dessicated	
			1.50				
Trialpit Complete at 1.50 m							

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable.

Groundwater: Not detected.



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

Depth
1.80m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
						TOPSOIL	
0.50	D		0.30			Stiff sandy CLAY with rootlets - dessicated	
1.00	D						1
			1.80			Trialpit Complete at 1.80 m	2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable. Soakage testing carried out - results reported separately

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

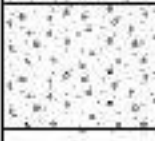
Depth
1.60m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL	
0.50	D					Stiff Brown sandy CLAY	
1.00	D					rootlets and desiccated to 0.90 m	1
			1.40			Orange-brown sandy clayey GRAVEL	
			1.60			Trialpit Complete at 1.60 m	2
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pitsides stable.

Groundwater: Not encountered



Project Name
Havant Road Site

Project No.
J11145

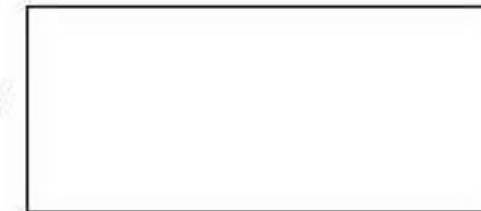
Co-ords: -
Level: -

Date
15/09/2011

Location: Havant Road, Warblington, Emsworth

Dimensions: -

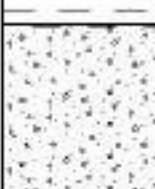
Depth
2.20m



Scale
1:25

Client: BDW Southampton

Logged By
DPB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.20	D		0.25			TOPSOIL	
1.00	D					Stiff becoming firm brown CLAY	1
						desiccated with rootlets to 1.20 m	
			1.90			Brown clayey sandy GRAVEL	2
			2.20			Trialpit Complete at 2.20 m	
							3
							4

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600 mm bucket. Trial pit sides stable.

Groundwater: Not encountered.



Site Havant Road, Site, Warblington

Job Number

J11145

Client BDW Southampton

Sheet

1 / 3

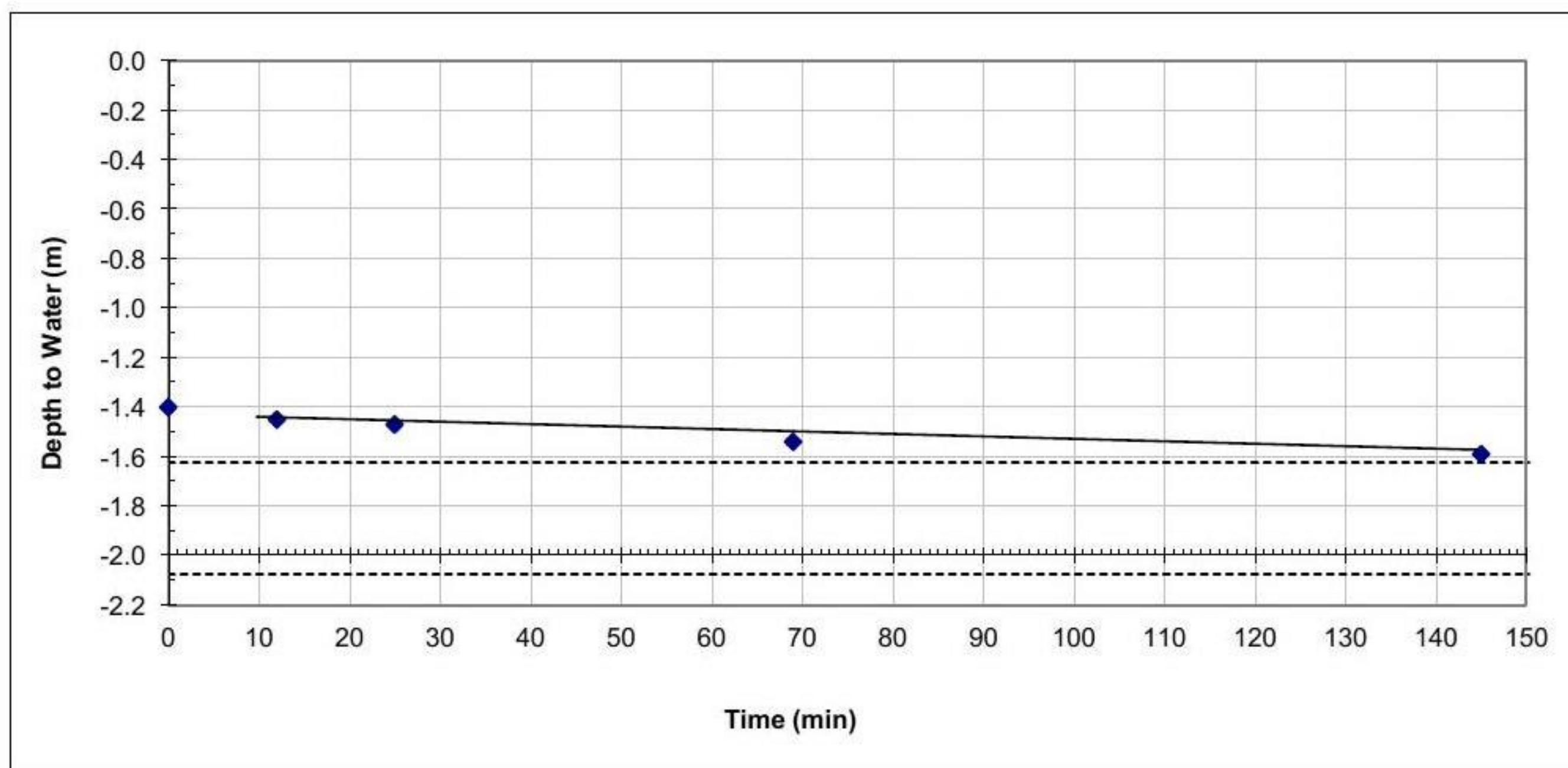
Trial Pit No. 1

Soakage Test No. 1

Pit Length (m) 1.9

Pit Width (m) 0.65

Pit Depth (m) 2.3



Design Soakage Rate

2.5E-06

m/s

(based on linear portion of graph as shown)

0.22

m/day

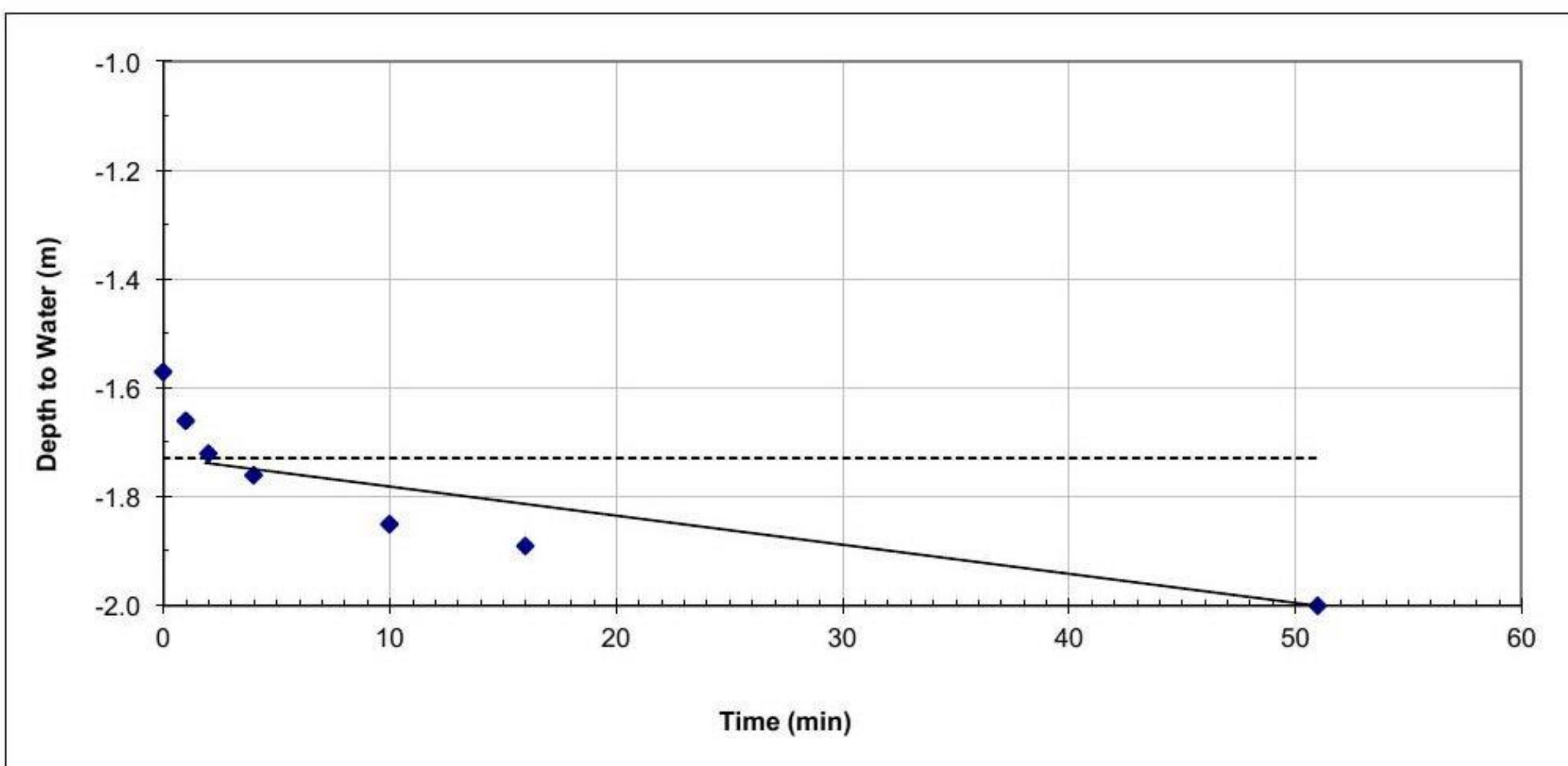
Trial Pit No. 2

Soakage Test No. 1

Pit Length (m) 1.9

Pit Width (m) 0.65

Pit Depth (m) 2.2



Design Soakage Rate

4.0E-05

m/s

(based on linear portion of graph as shown)

3.42

m/day

Site Havant Road, Site, Warblington

Job Number

Client BDW Southampton

Sheet

2 / 3

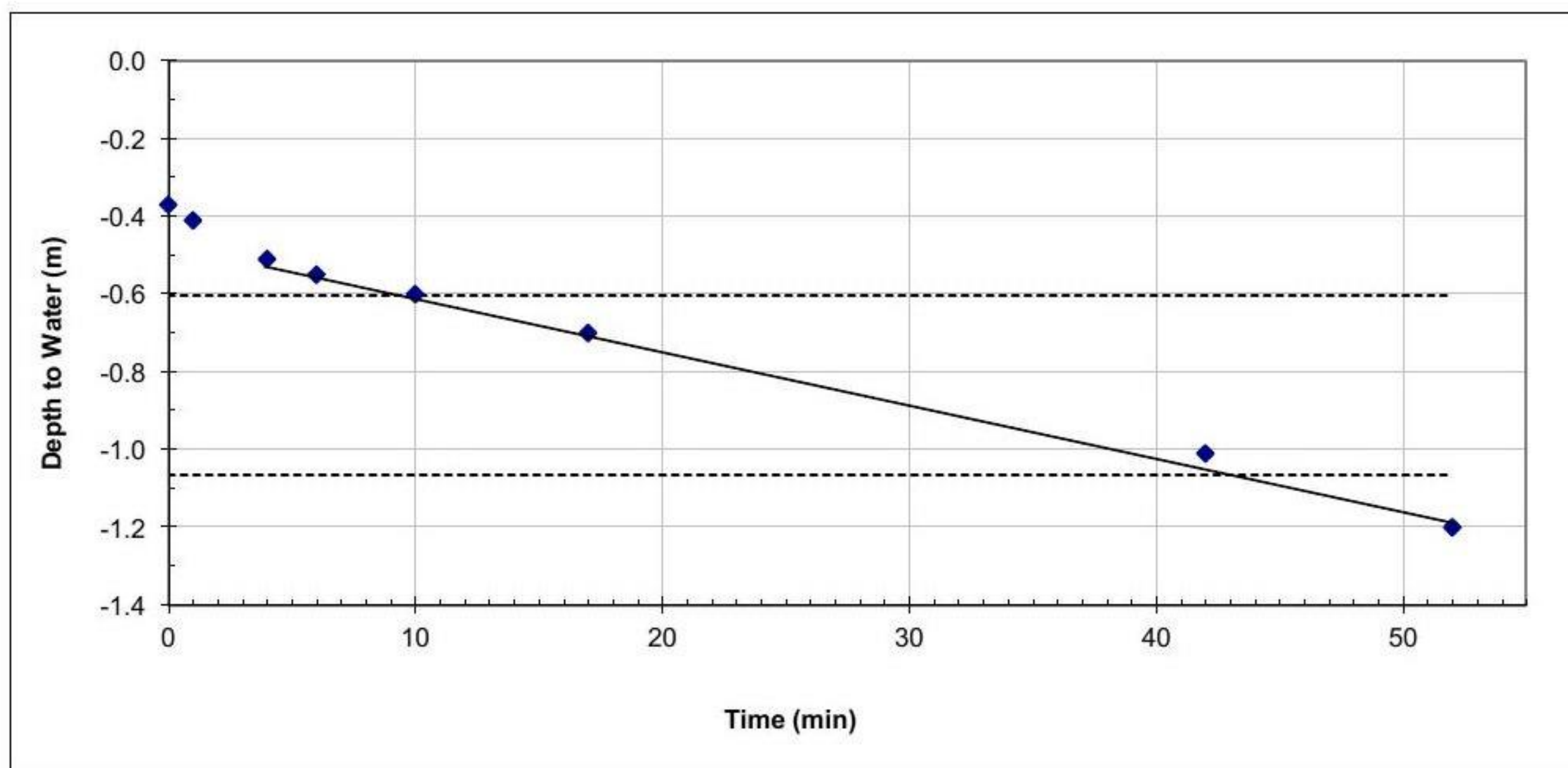
Trial Pit No. 3

Soakage Test No. 1

Pit Length (m) 1.8

Pit Width (m) 0.65

Pit Depth (m) 1.3



Design Soakage Rate

8.4E-05
7.23

m/s
m/day

(based on linear portion of graph as shown)

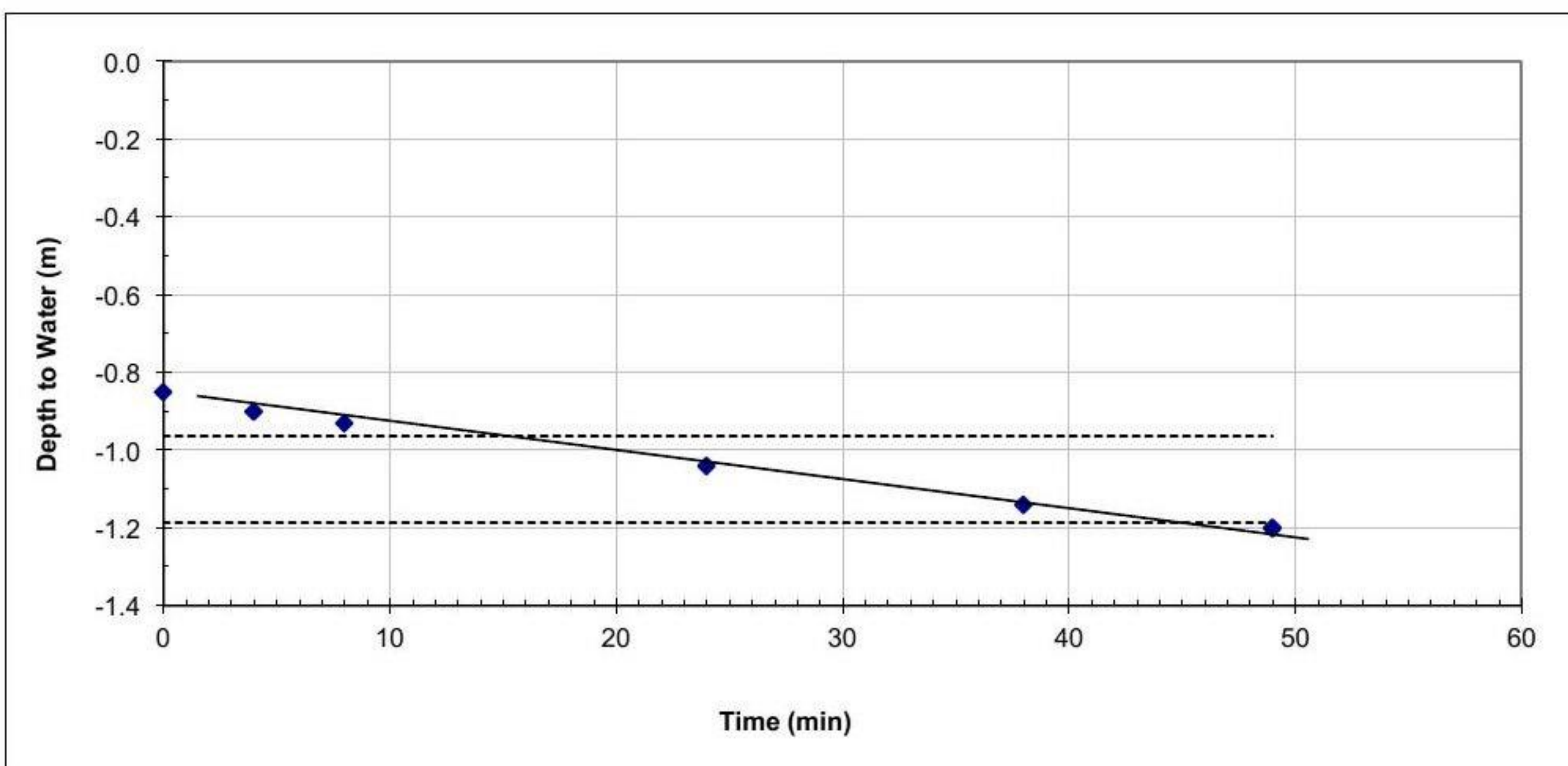
Trial Pit No. 4

Soakage Test No. 1

Pit Length (m) 1.8

Pit Width (m) 0.65

Pit Depth (m) 1.3



Design Soakage Rate

5.5E-05
4.78

m/s
m/day

(based on linear portion of graph as shown)

Site Havant Road, Site, Warblington

Job Number

Client BDW Southampton

Sheet

2 / 3

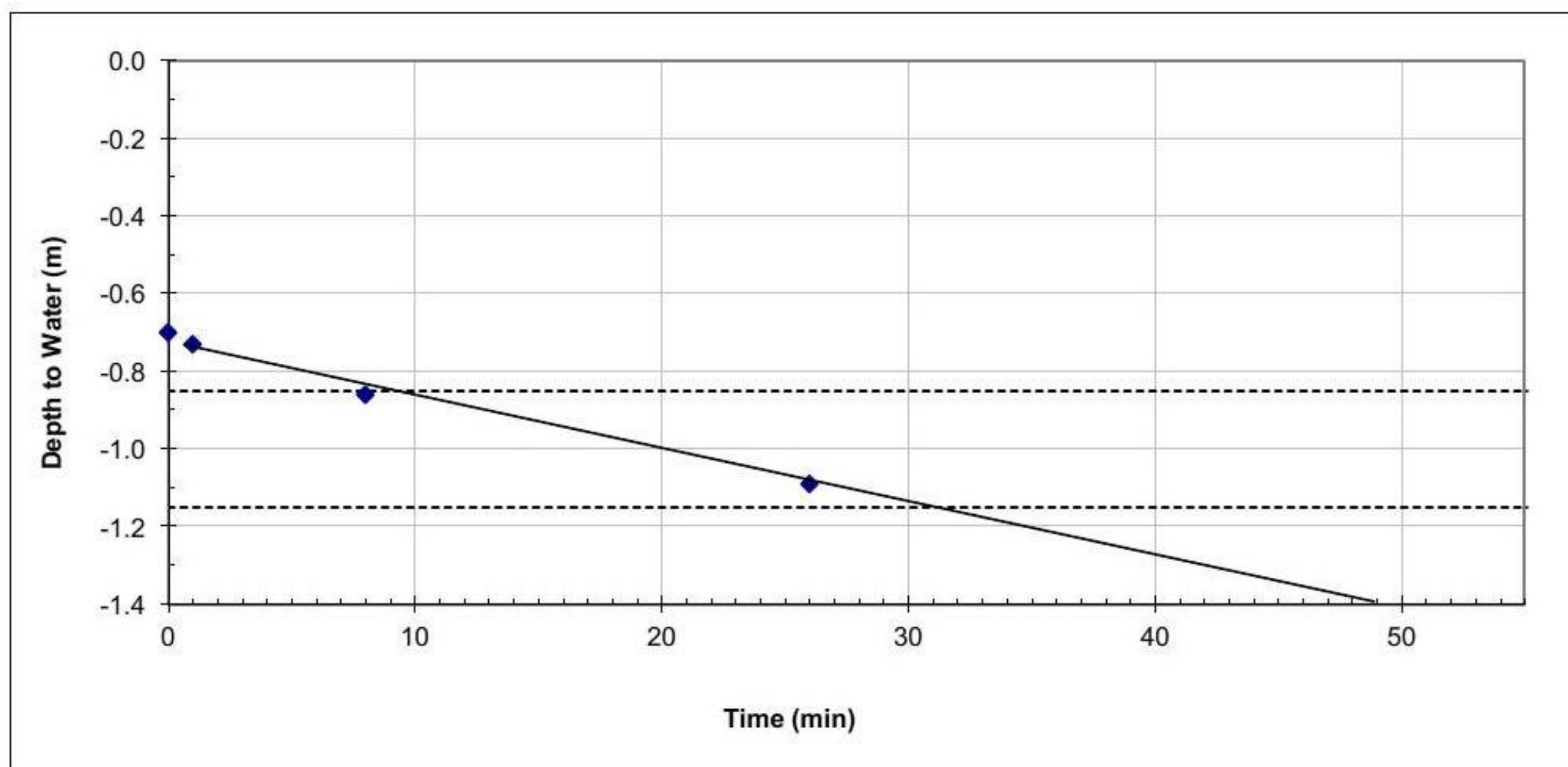
Trial Pit No. 5

Soakage Test No. 1

Pit Length (m) 1.7

Pit Width (m) 0.65

Pit Depth (m) 1.3



Design Soakage Rate

6.5E-05
5.58

m/s
m/day

(based on linear portion of graph as shown)

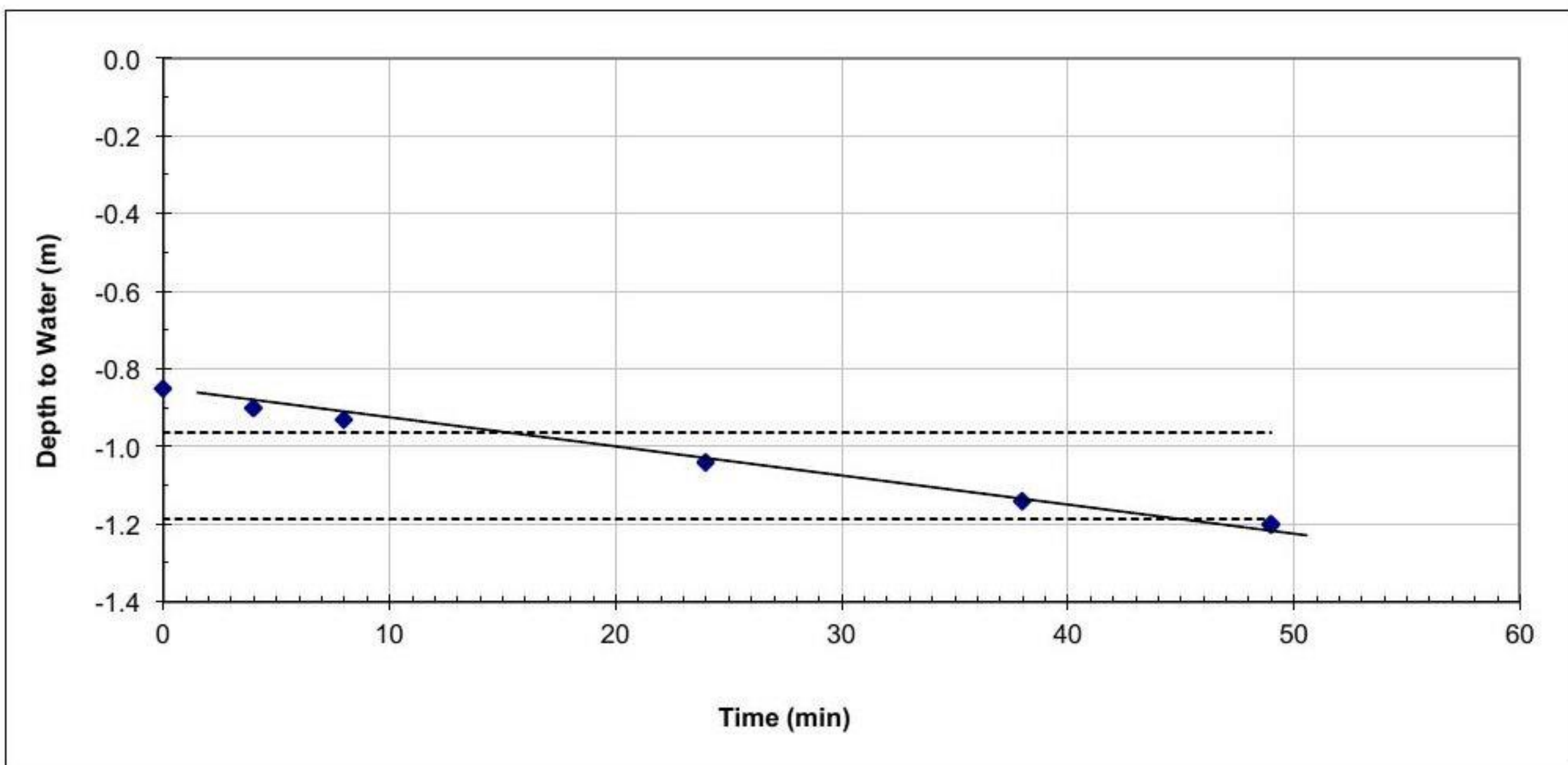
Trial Pit No. 4

Soakage Test No. 1

Pit Length (m) 1.8

Pit Width (m) 0.65

Pit Depth (m) 1.3



Design Soakage Rate

5.5E-05
4.78

m/s
m/day

(based on linear portion of graph as shown)



Dominic Brightman
Wilson Bailey Ltd
Forge Farm Yard
Compton Chamberlayne
Wiltshire SP3 5DS



QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 851105
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 7081

Site Reference: Havant Road

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 02/09/2011

Sample Scheduled Date: 02/09/2011

Report Issue Number: 1

Reporting Date: 08/09/2011

Authorised by:

Russell Jarvis
Director

On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director

On behalf of QTS Environmental Ltd



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105



Soil Analysis Certificate

QTS Environmental Report No: 7081	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Havant Road	TP / BH No	BH1	BH2	BH3	BH5	BH6
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.15	0.20	0.30	0.30	0.10
Reporting Date: 08/09/2011	QTSE Sample No	32024	32025	32026	32027	32028

Determinand	Unit	MDL	Accreditation					
Stone Content	%	<0.1	NONE	<0.1	<0.1	<0.1	<0.1	<0.1

General Inorganics	Unit	MDL	Accreditation					
pH	pH Units	+ / - 0.1	MCERTS	7.4	7.2	7.2	7.3	7.2
Total Organic Carbon (TOC)	%	<0.1	NONE	2.1	1.8	2.8	2.1	2.1
Total Phenols (monohydric)	mg/kg	<2	NONE	<2	<2	<2	<2	<2

Metals	Unit	MDL	Accreditation					
Arsenic (As)	mg/kg	<2	MCERTS	4	3	4	5	4
W/S Boron	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Cadmium (Cd)	mg/kg	<0.5	MCERTS	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (hexavalent)	mg/kg	<2	NONE	<2	<2	<2	<2	<2
Chromium (Cr)	mg/kg	<2	MCERTS	17	16	18	17	17
Copper (Cu)	mg/kg	<4	MCERTS	9	8	12	11	10
Lead (Pb)	mg/kg	<3	MCERTS	22	19	36	27	23
Mercury (Hg)	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Nickel (Ni)	mg/kg	<3	MCERTS	9	9	10	10	10
Selenium (Se)	mg/kg	<3	NONE	<3	<3	<3	<3	<3
Zinc (Zn)	mg/kg	<3	MCERTS	41	34	49	51	138

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105



Soil Analysis Certificate - Speciated PAHs

QTS Environmental Report No: 7081	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Havant Road	TP / BH No	BH1	BH2	BH3	BH5	BH6
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.15	0.20	0.30	0.30	0.10
Reporting Date: 08/09/2011	QTSE Sample No	32024	32025	32026	32027	32028

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	MCERTS	<0.1	<0.1	0.23	<0.1	<0.1
Pyrene	mg/kg	<0.1	MCERTS	<0.1	<0.1	0.19	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	MCERTS	<0.1	<0.1	0.11	<0.1	<0.1
Chrysene	mg/kg	<0.1	MCERTS	<0.1	<0.1	0.13	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	<0.1	MCERTS	<0.1	<0.1	0.13	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	<0.1	MCERTS	<0.1	<0.1	<0.1	<0.1	<0.1

Total EPA-16 PAHs	mg/kg	<1.6	MCERTS	<1.6	<1.6	<1.6	<1.6	<1.6
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Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105



Soil Analysis Certificate - TPH CWG Banded

QTS Environmental Report No: 7081	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Havant Road	TP / BH No	BH1	BH2	BH3	BH5	BH6
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.15	0.20	0.30	0.30	0.10
Reporting Date: 08/09/2011	QTSE Sample No	32024	32025	32026	32027	32028

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic >C6 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aliphatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C21 - C34	mg/kg	<6	NONE	<6	<6	<6	<6	<6

Aliphatic (C5 - C34)	mg/kg	<6	NONE	<6	<6	<6	<6	<6
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Aromatic >C5 - C7	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic >C7 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aromatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C21 - C35	mg/kg	<6	NONE	<6	<6	<6	<6	<6

Aromatic (C5 - C35)	mg/kg	<6	NONE	<6	<6	<6	<6	<6
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Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



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Soil Analysis Certificate - BTEX						
QTS Environmental Report No: 7081	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Havant Road	TP / BH No	BH1	BH2	BH3	BH5	BH6
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.15	0.20	0.30	0.30	0.10
Reporting Date: 08/09/2011	QTSE Sample No	32024	32025	32026	32027	32028

Determinand	Unit	MDL	Accreditation					
Benzene	µg/kg	<2	MCERTS	<2	<2	<2	<2	<2
Toluene	µg/kg	<5	MCERTS	<5	<5	<5	<5	<5
Ethylbenzene	µg/kg	<10	MCERTS	<10	<10	<10	<10	<10
p & m-xylene	µg/kg	<10	MCERTS	<10	<10	<10	<10	<10
o-xylene	µg/kg	<10	MCERTS	<10	<10	<10	<10	<10

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



QTS Environmental Report No: 7081	
Wilson Bailey Ltd	
Site Reference: Havant Road	
Project / Job Ref: None Supplied	
Order No: None Supplied	
Reporting Date: 08/09/2011	

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4480

4480

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 7081

Wilson Bailey Ltd

Site Reference: Havant Road

Project / Job Ref: None Supplied

Order No: None Supplied

Reporting Date: 08/09/2011

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	AR	Asbestos Screening	Visual screening of samples for fibrous material	E024
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water followed by titration using silver nitrate	E021
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by turbidimeter	E020
Soil	D	Fluoride - Water Soluble	Test Kit	E023
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	D	Phosphorus	Determination of phosphorus by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Sulphate (as SO ₄) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	D	Sulphate (as SO ₄) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	AR	Sulphide	Determination of sulphide by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia, potassium iodide/iodate followed by ICP-OES	E002
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E009
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E009
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E010
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E009
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	EPH (with florisil cleanup)	Determination of acetone/hexane extractable hydrocarbons with florisil cleanup step by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001

Key

D Dried
AR As Received

Site Havant Road Site, Warblington, Emsworth, Hampshire

Client BDW Southampton

