

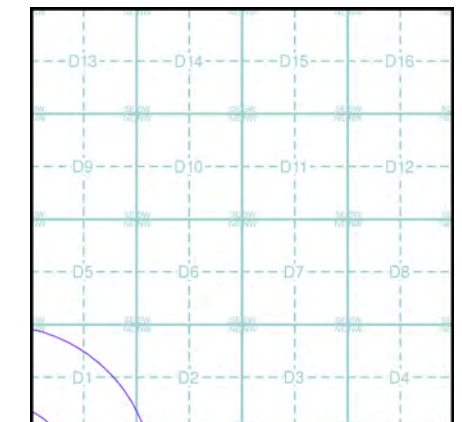
General

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

Agency and Hydrological (Flood)

-  Extreme Flooding from Rivers or Sea without Defences (Zone 2)
-  Flooding from Rivers or Sea without Defences (Zone 3)
-  Area Benefiting from Flood Defence
-  Flood Water Storage Areas
-  Flood Defence

Flood Map - Slice D

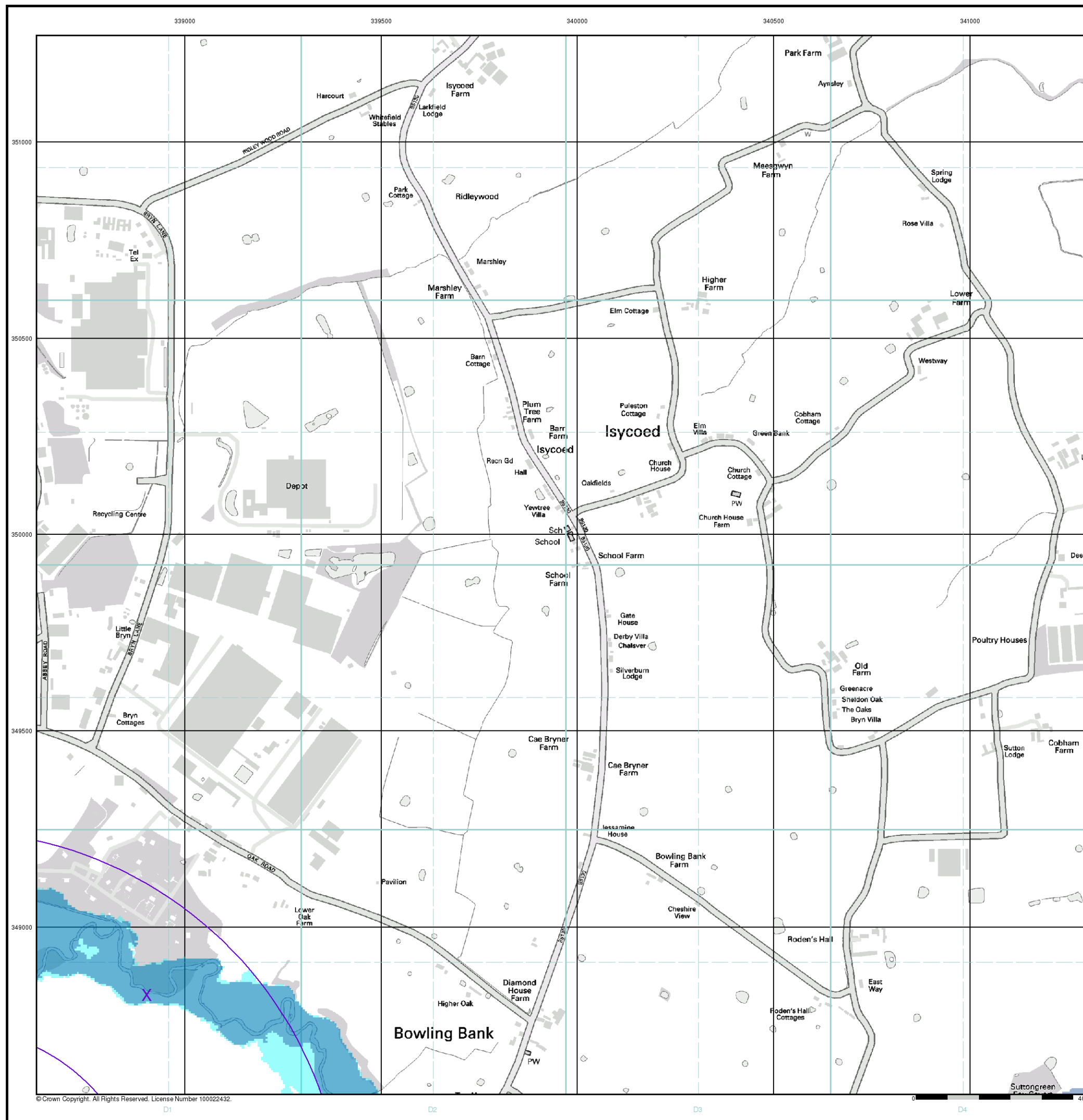


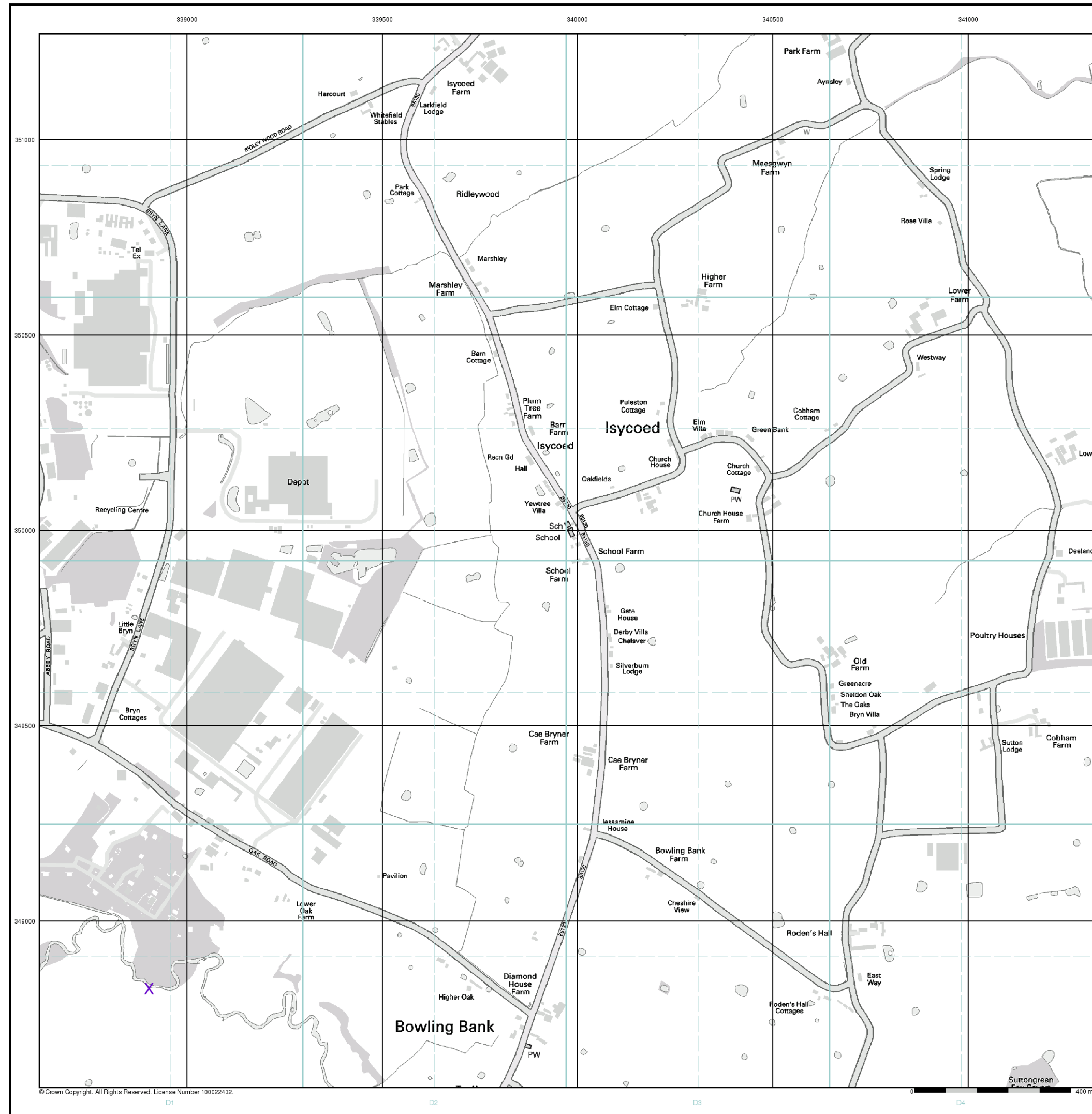
Order Details

Order Number: 35238207_1_1
 Customer Ref: 305001-00001 50065-29 ARS
 National Grid Reference: 338900, 348830
 Slice: D
 Site Area (Ha): 17.46
 Search Buffer (m): 1000

Site Details

Wales & West Utilities Ltd, Maelor Works, Marchwiell, WREXHAM, Clwyd, LL13 0UW





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General

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

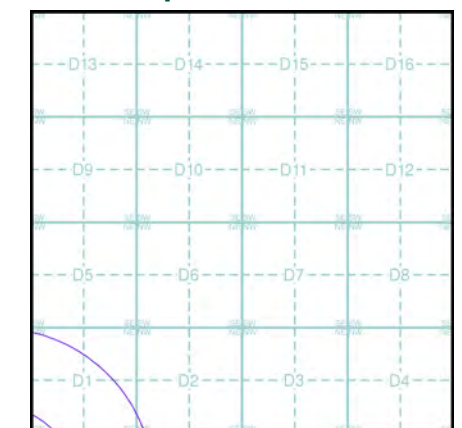
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

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

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

Borehole Map - Slice D



Order Details

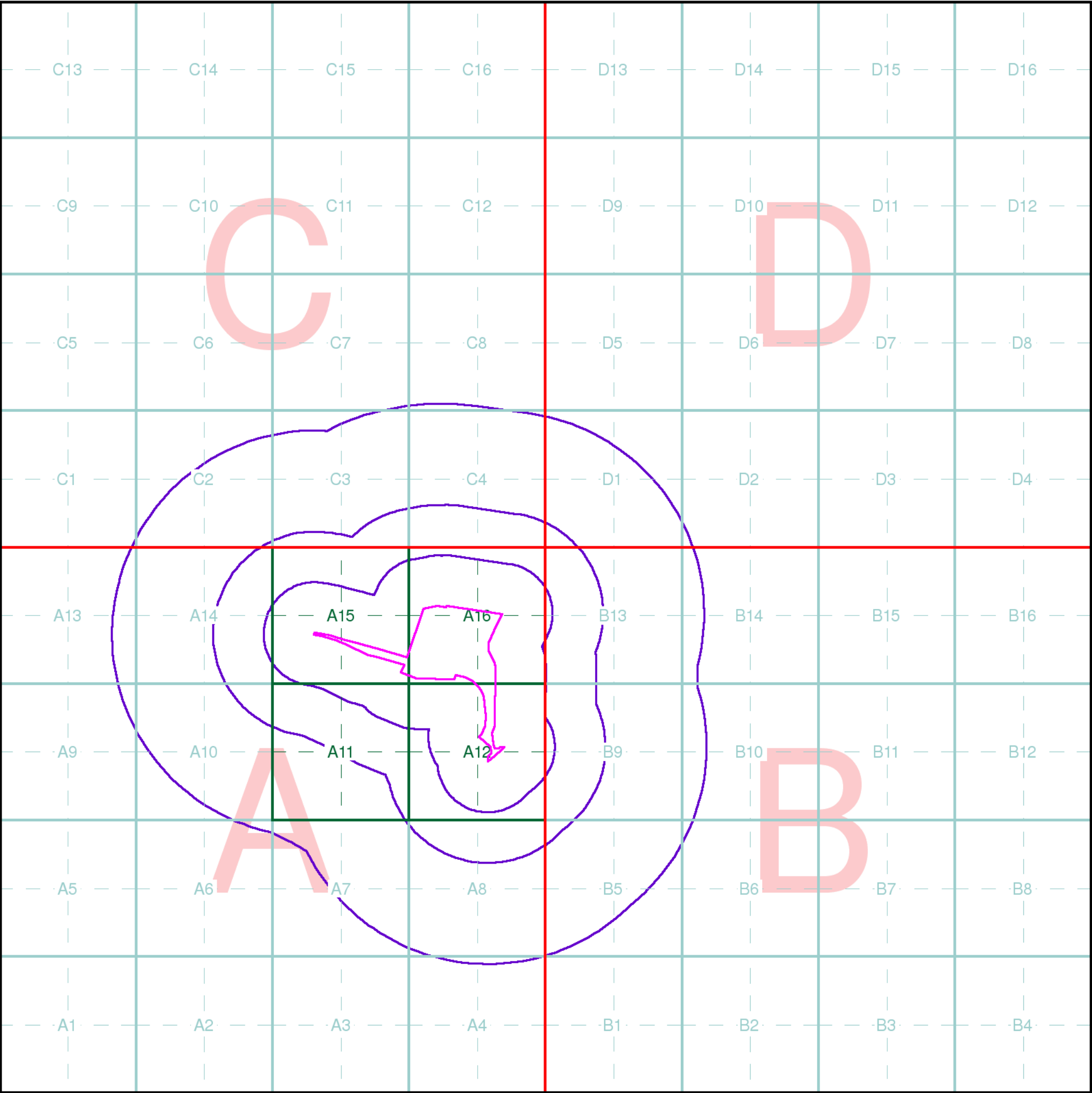
Order Number: 35238207_1_1
Customer Ref: 305001-00001 50065-29 ARS
National Grid Reference: 338900, 348830
Slice: D
Site Area (Ha): 17.46
Search Buffer (m): 1000

Site Details

Wales & West Utilities Ltd, Maelor Works, Marchwiel, WREXHAM, Clwyd, LL13 0UW



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

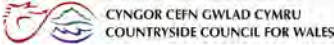
Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms C Coldrey, Worley Parsons Ltd, 3-8 Redcliffe Parade
West, Bristol, BS1 6SP

Order Details

Order Number: 35238207_1_1
Customer Ref: 305001-00001 50065-29 ARS
National Grid Reference: 338150, 348050
Site Area (Ha): 17.46
Search Buffer (m): 1000

Site Details

Wales & West Utilities Ltd, Maelor Works, Marchwiell,
WREXHAM, Clwyd, LL13 0UW



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

LANDMARK TERMS AND CONDITIONS

Definitions

"Authorised Reseller" means an agent or reseller of Landmark whom Landmark has duly appointed to resell its Reports and Services.

"Content" means any data, computing and information services and software, and other content and documentation or support materials and updates included in and/or supplied by or through the Websites, in Reports or Services or in any other way by Landmark and shall include Landmark developed and Third Party Content.

"First Purchaser" means the first person, or legal entity to purchase the Property Site following provision of a Report.

"First Purchaser's Lender" means the funding provider for the First Purchaser

"Information Pack" means a pack compiled by or on behalf of the owner or prospective buyer of the Property Site, designed to aid the marketing or purchase of the Property Site and containing information provided by or on behalf of the owner or prospective buyer of the Property Site.

"Intellectual Property Rights" means copyright, patent, design right (registered or unregistered), service or trade mark (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right.

"Order" means the request for Services from Landmark by You.

"Property Site" means a land site on which Landmark provides a Service.

References to **"We"**, **"Us"** and **"Our"** are references to Landmark Information Group Limited ("Landmark"), whose registered office is 7 Abbey Court, Eagle Way, Exeter, EX2 7HY. Where You are not ordering the Services directly from Landmark, but from an Authorised Reseller, references to "Landmark" or "We", "Us" and "Our" shall be construed so as to mean either Landmark and/or the Authorised Reseller as the context shall indicate.

References to **"You/Your/Yourself"** refer to the contracting party who accesses the Website or places an Order with Landmark.

"Report" includes any information that Landmark supplies to You including all reports, services, datasets, software or information contained in them.

"Services" means the provision of any service by Landmark pursuant to these Terms, including without limitation, any Report.

"Landmark Fees" means any charges levied by Landmark for Services provided to You.

"Suppliers" means any organisation who provides data or information of any form to Landmark.

"Terms" means these Terms & Conditions.

"Third Party Content" means the services, software, information and other content or functionality provided by third parties and linked to or contained in the Services.

"Websites" means websites hosted by Landmark and includes the Content and any report, service, document, data-set, software or information contained therein, derived there from or thereby.

1. Terms & Conditions

- These Terms govern the relationship between You and Landmark whether You are an unregistered visitor to the Website or are purchasing Services. Where these Terms are not expressly accepted by You they will be deemed to have been accepted by You, and You agree to be bound by these Terms when You place any Order, or pay for any Services provided
- If the person communicating with Landmark is an Authorised Reseller, they must ensure that You agree to these Terms.
- The headings in these Terms are for convenience only and shall not affect the meaning or interpretation of any part of these Terms.
- Landmark may modify these Terms, and may discontinue or revise any or all other aspects of the Services at our sole discretion, with immediate effect and without prior notice, including without limitation changing the Services available at any given time. Any amendment or variation to these Terms shall be posted on our Websites. Continued use of the Services by You shall be deemed an acceptance by You to be bound by any such amendments to the Terms.
- These Terms, together with the prices and delivery details set out on our Websites, Landmark's Privacy Policy and Your Order comprise the whole agreement relating to the supply of Services to You by Landmark. No prior stipulation, agreement, promotional material or statement whether written or oral made by any sales or other person or representative on our behalf should be understood as a variation of these Terms. Save for fraud or misrepresentation, Landmark shall have no liability for any such representation being untrue or misleading.
- These Terms shall prevail at all times to the exclusion of all other terms and conditions including any terms and conditions which You may purport to apply even if such other provisions are submitted in a later document or purport to exclude or override these Terms and neither the course of conduct between parties nor trade practice shall act to modify these Terms.

2. Services

- Landmark will use reasonable care and skill in providing the Services to You, however, the Services are provided on the express basis that the information and data supplied in the Services are derived from third party sources and Landmark does not warrant the accuracy or completeness of such information or data. Such information is derived solely from those sources specifically cited in the Services and Landmark does not

claim that these sources represent an exhaustive or comprehensive list of all sources that might be consulted.

3. Intellectual Property

- You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either Landmark or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights.
- Subject always to these Terms You may, without further charge, make the Services available to;
 - the owner of the Property at the date of the Report,
 - any person who purchases the whole of the Property Site,
 - any person who provides funding secured on the whole of the Property Site,
 - any person for whom You act in a professional or commercial capacity,
 - any person who acts for You in a professional or commercial capacity; and
 - prospective buyers of the Property Site as part of an Information Pack but for the avoidance of doubt, Landmark shall have no liability to such prospective buyer unless the prospective buyer subsequently purchases the Property Site, and the prospective (or actual) buyer shall not be entitled to make the Service available to any other third party.Accordingly Landmark shall have the same duties and obligations to those persons in respect of the Services as it has to You.
- Each of those persons referred to in clause 3.b. shall have the benefit and the burden of Your rights and obligations under these Terms. The limitations of Landmark's liability as set out in clause 6 shall apply to all users of the Service in question in aggregate and Landmark shall not be liable to any other person.
- All parties given access to the Services agree that they will treat as strictly private and confidential the Services and all information which they obtain from the Services and shall restrict any disclosure to employees or professional advisors to enable the relevant party to conduct its internal business. The requirement in this clause to treat the Services as confidential shall include a requirement to maintain adequate security measures to safeguard the Services from unauthorised access, use or copying.
- Each recipient of the Services agrees (and agrees it will cause its employees, agents or contractors who may from time to time have access to the Services to agree) it will not, except as permitted herein or by separate agreement with Landmark:-
 - effect or attempt to effect any modification, merger or change to the Service, nor permit any other person to do so; or
 - copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or
 - remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party;
 - create any product which is derived directly or indirectly from the data contained in the Services
- The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.
- You are permitted to make five copies of any Report, but are not authorised to re-sell the Report, any part thereof or any copy thereof unless you are an Authorised Reseller. Further copies may not be made in whole or in part without the prior written permission of Landmark who shall be entitled to make a charge for each additional copy.

4. Charges

- VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.
- An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.
- We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.
- Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of

Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

- Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-
 - You fail to make any payment due in accordance with clause 4;
 - You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
 - You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.
 - If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.
 - Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.
- ## 6. Liability
- We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.
 - Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or wilful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.
 - As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or wilful default and subject to clause 6.o below neither Landmark nor any person providing information contained in any Services shall in any circumstances be liable for any inaccuracies, faults or omissions in the Services, nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.
 - Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.
 - In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.
 - Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.
 - You acknowledge that:-
 - Subject to clause 6.o below You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts of omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
 - Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
 - no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining saleability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
 - Subject to clause 6.o below, Landmark shall not be

responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.

- Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
- The Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
- Landmark offer no warranty for the performance of any linked internet service not operated by Landmark;
- You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery;
- Any support or assistance provided to You in connection with these Terms is at Your risk;
- All liability for any insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.
- Professional opinions contained in Reports are provided to Landmark by third parties, and such third parties are solely liable for the opinion provided. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Wilbourn Associates Limited, and any issues with regard to the provision of such opinion should be taken up with the relevant third party.
- If Landmark provides You with any additional service obtained from a third party, including but not limited to any interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, subject to clause 6.o below Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties.
- In any event no person may rely on a Service more than 12 months after its original date.
- If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
- Time shall not be of the essence with respect to the provision of the Services.
- Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Subject to clause 6.o below, Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
- Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6i above.
- Landmark obtains much of the information contained in its Report from third parties. Landmark will not accept any liability to You for any negligent or incorrect entry, or error or corruption in the Third Party Content supplied to Landmark, but Landmark's Suppliers may be liable for such

negligent or incorrect entries, or errors or corruptions, subject to the terms and conditions on which they supply the Third Party Content to Landmark.

7. Contribution

- Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
 - Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")
 - In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms:
 - the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
 - the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
 - the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
 - the Contribution will not be paid in respect of any of the following:
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures.
 - Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
 - Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
 - Any condition which is caused by acts of War or an Act of Terrorism.
 - Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
 - Any fines liquidated damages punitive or exemplary damages.
 - Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
 - Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
 - Any losses incurred following a material change in use of, alteration or development of the Property Site.
- The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £60,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
- Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
- Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.
- In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 3 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or

complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.

- In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under PartII(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e.
- Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.

8. Events Beyond Our Control

- You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or checking data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.

9. Severability

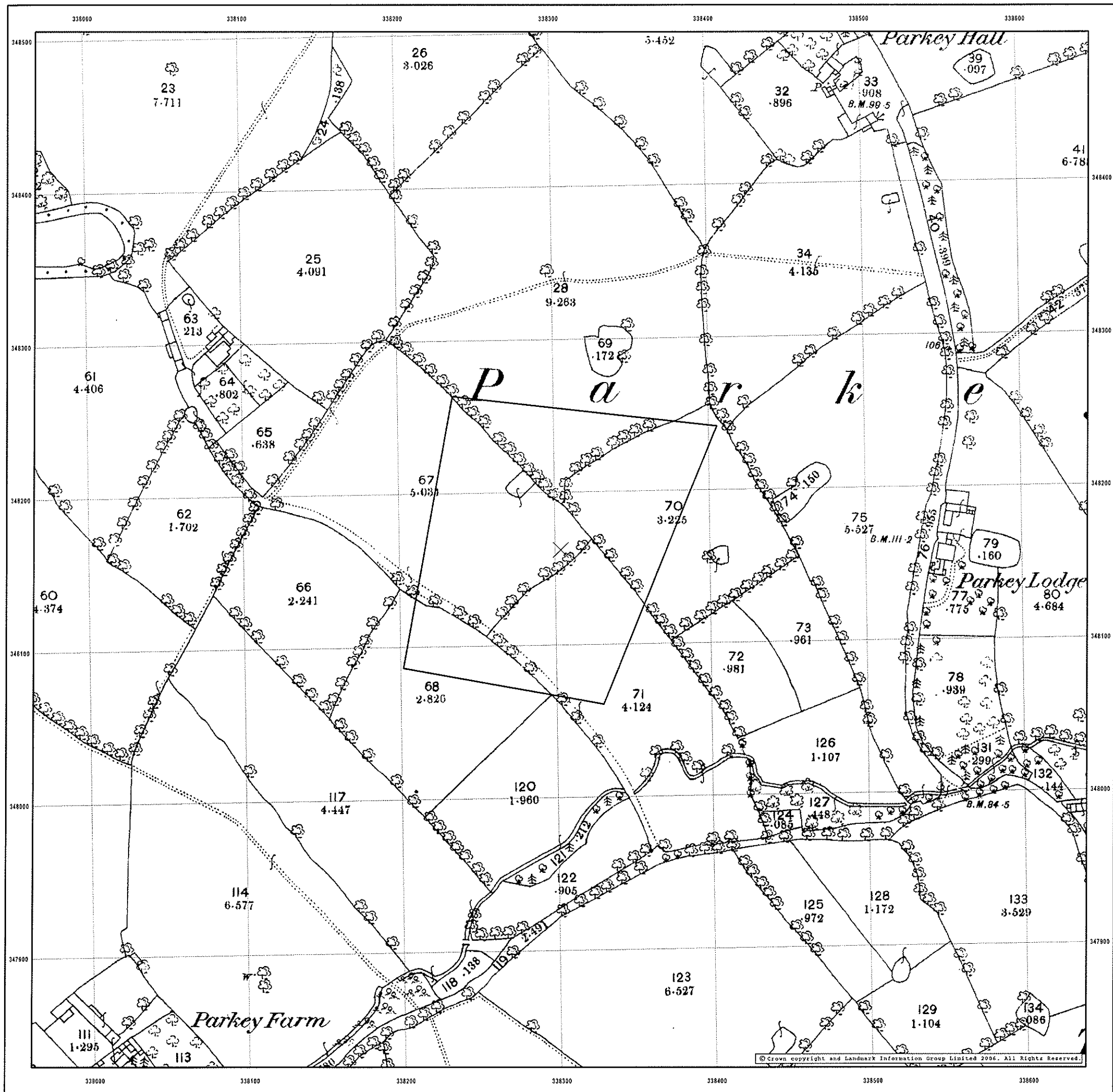
- If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.

10. Governing Law

- These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts if any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.

11. General; Complaints

- Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
- Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
- No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
- Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and subject to paragraph e below all notices from Landmark to You will be displayed on our Websites from time to time.
- Any complaints in relation to the Services should, in the first instance, be in writing addressed to the Customer Service Support Manager at the Landmark registered office. Landmark or its agents will respond to any such complaints in writing as soon as practicable possible.
- A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
- Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:44)

Customer Ref: C Coldrey, 50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

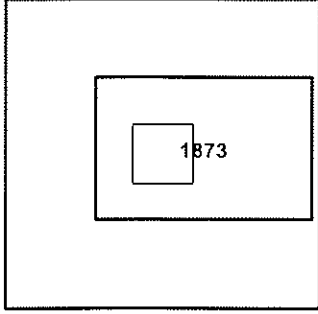
Historical Map Legend

Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

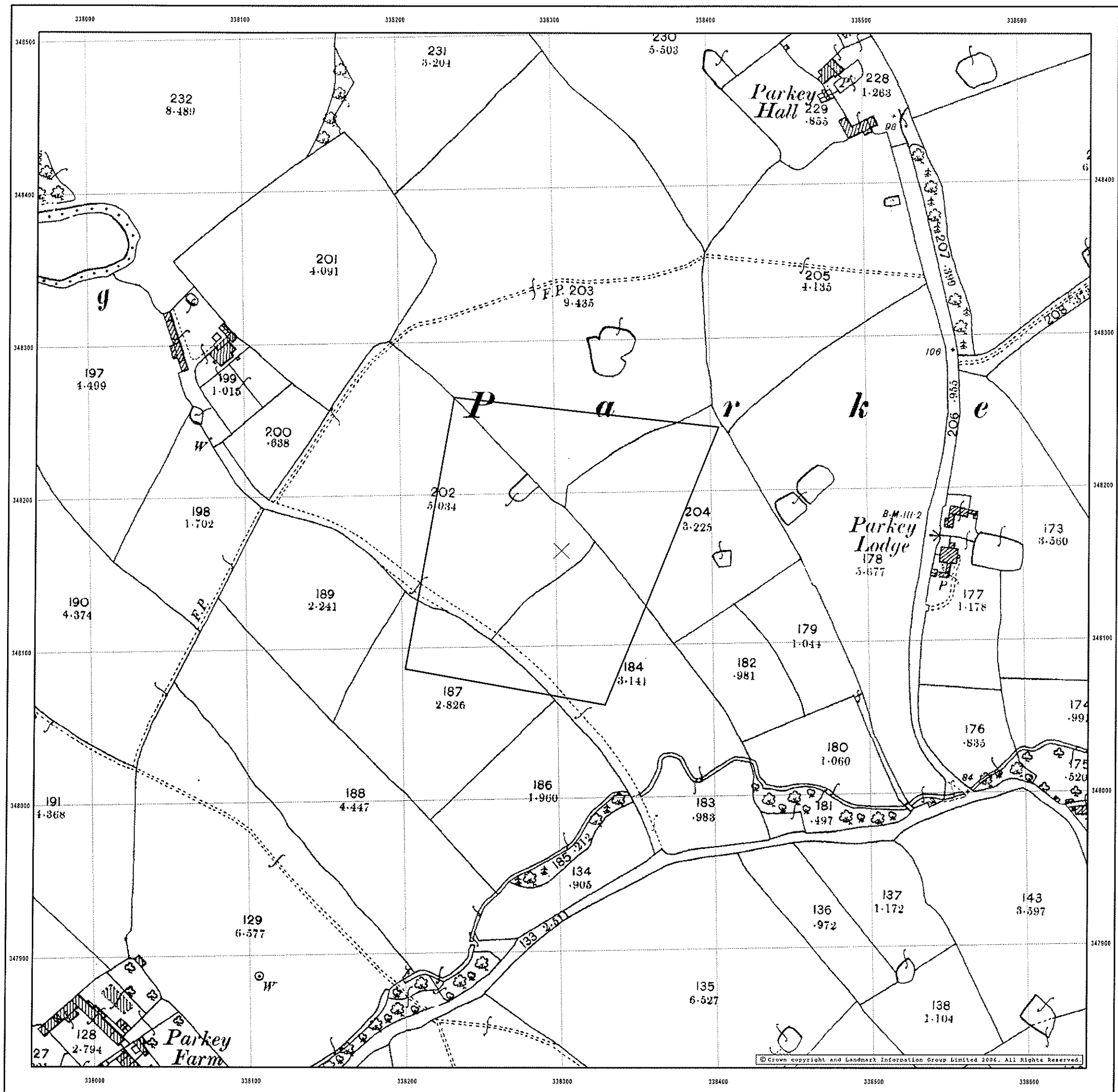
Ordnance Survey County Series

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

DENBIGHSHIRE
Published 1873
Source map scale - 1:2,500



Date(s) of Publication 1 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:45)
Customer Ref: C Coldrey, 50065-25
Komet Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

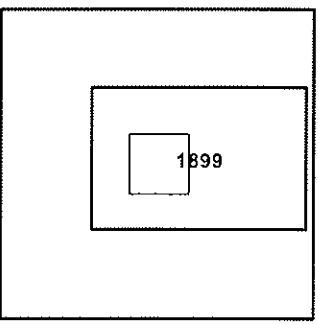
SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

Historical Map Legend

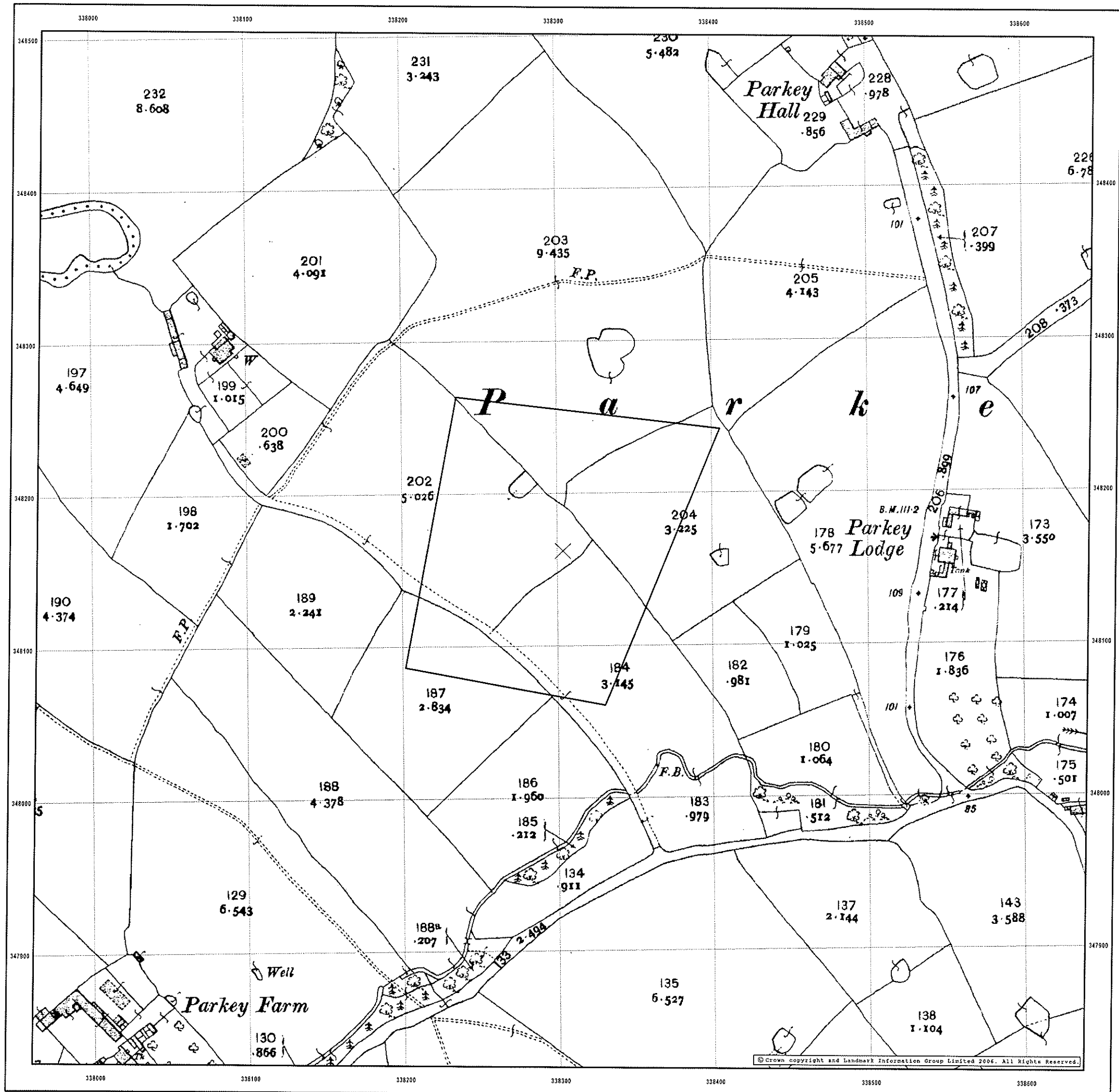
Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

Ordnance Survey County Series 2
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1886 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

DENBIGHSHIRE
Published 1899
Source map scale - 1:2,500



Date(s) of Publication 2 of 24



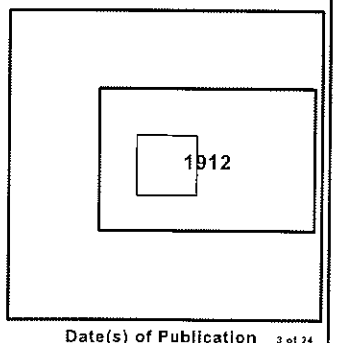
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(19-Apr-2006 15:45)
Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

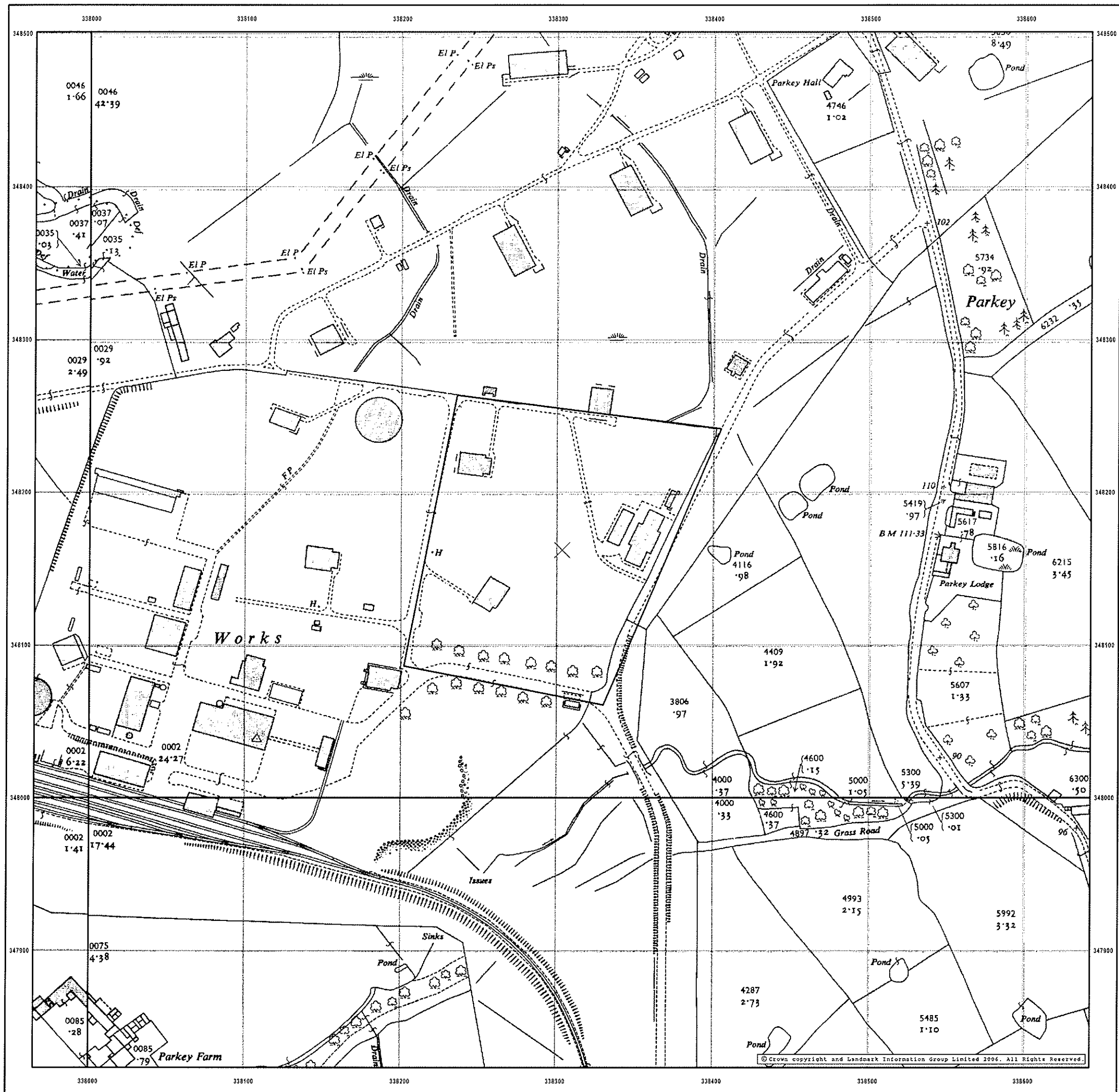
Historical Map Legend			
Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

Ordnance Survey County Series 3
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

DENBIGHSHIRE
Published 1912
Source map scale - 1:2,500



Date(s) of Publication 3 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(29-Apr-2006 13:45)

Customer Ref: C Coldrey, 50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

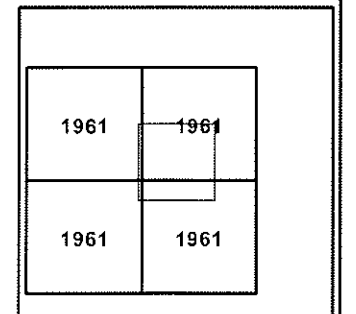
Bristol City
Bristol BS3 2BA

Historical Map Legend

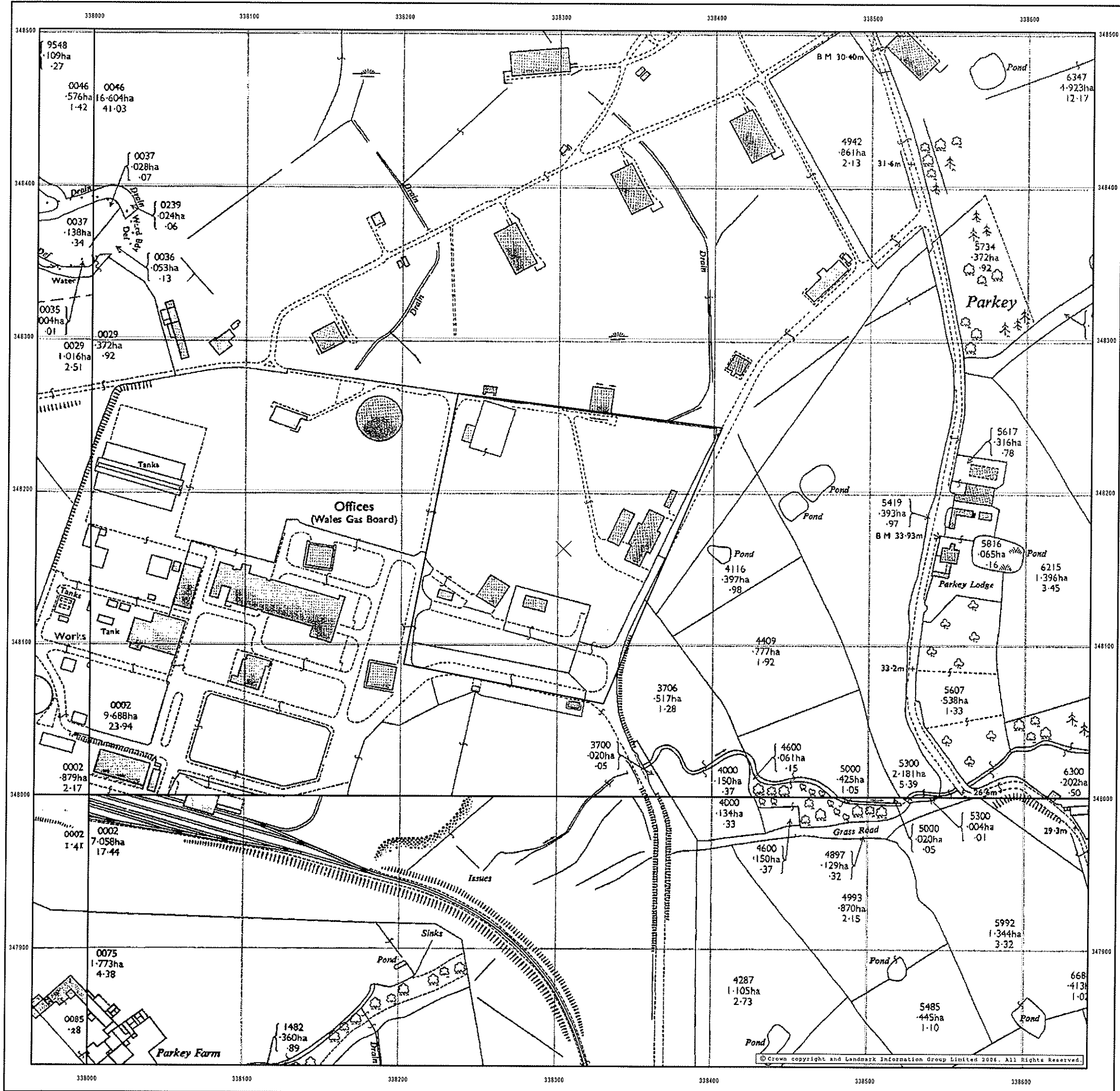
Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert
Slope	Slope	
Pylon	Electricity Transmission Line	Direction of Water flow
Marsh	Saltings	Orchard Tree
Rough Grassland	Scrub	Heath
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)
Coppice, Osier	Reeds	Bracken

Ordnance Survey Plan 1
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1886 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

ORDNANCE SURVEY PLAN
Published 1961
Source map scale - 1:2,500



Date(s) of Publication 4 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2004 15:43)

Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert
Slope	Slope	
Pylon	Electricity Transmission Line	Direction of Water flow
Marsh	Saltings	Orchard Tree
Rough Grassland	Scrub	Heath
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)
Non-coniferous Tree (Not Surveyed)		

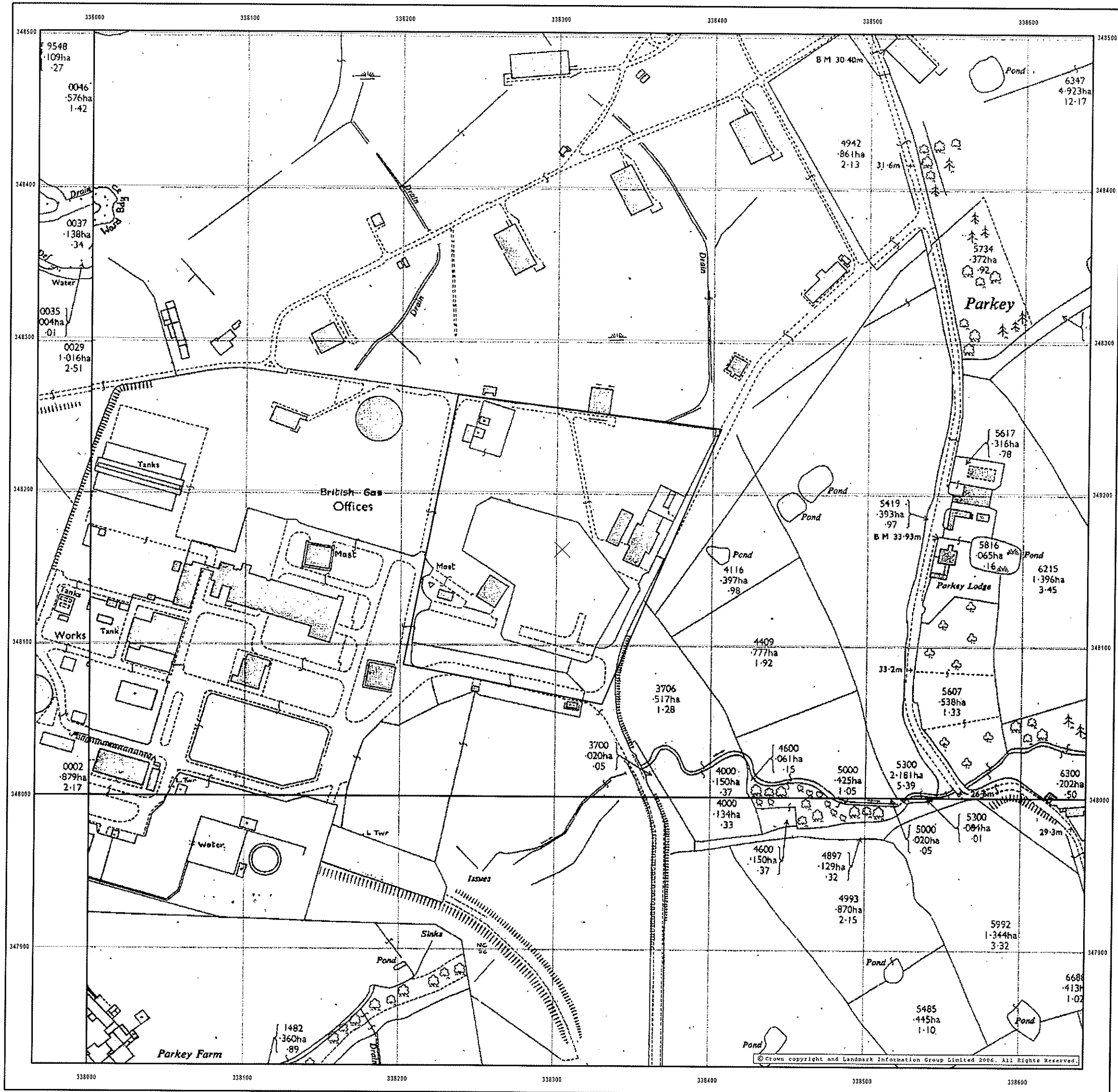
Additional SIMs

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

ORDNANCE SURVEY PLAN
Published 1961 to 1987
Source map scale - 1:2,500

1961	1961
1987	1961

Date(s) of Publication 5 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(29-Apr-2006 15:46)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

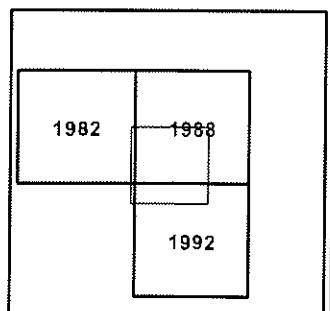
Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert
Slope	Slope	
Pylon	Electricity Transmission Line	Direction of Water flow
Marsh	Saltings	Orchard Tree
Rough Grassland	Scrub	Heath
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)
Non-coniferous Tree (Not Surveyed)		

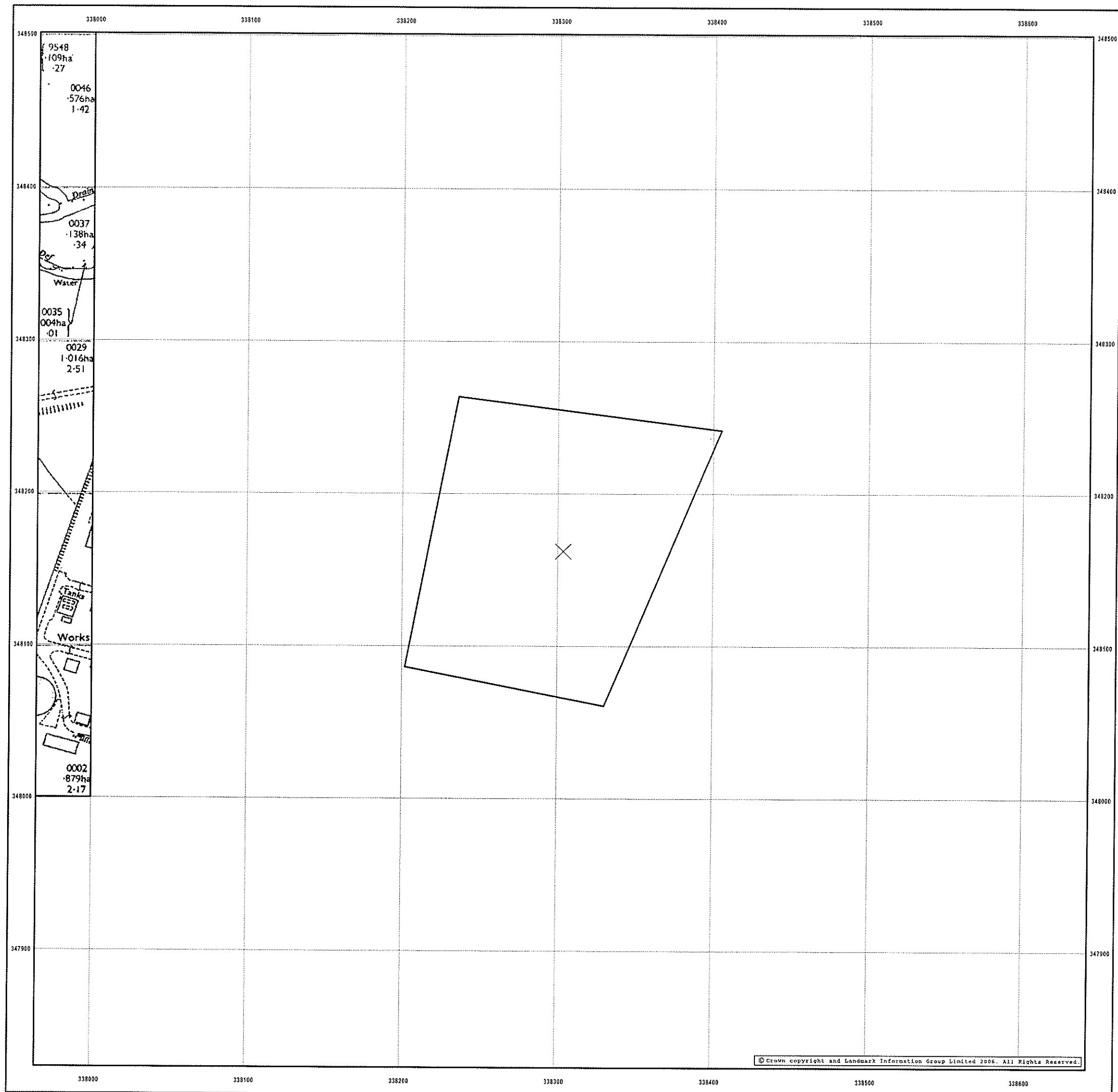
Additional SIMs

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

ORDNANCE SURVEY PLAN
Published 1982 to 1992
Source map scale - 1:2,500



Date(s) of Publication 6 of 24

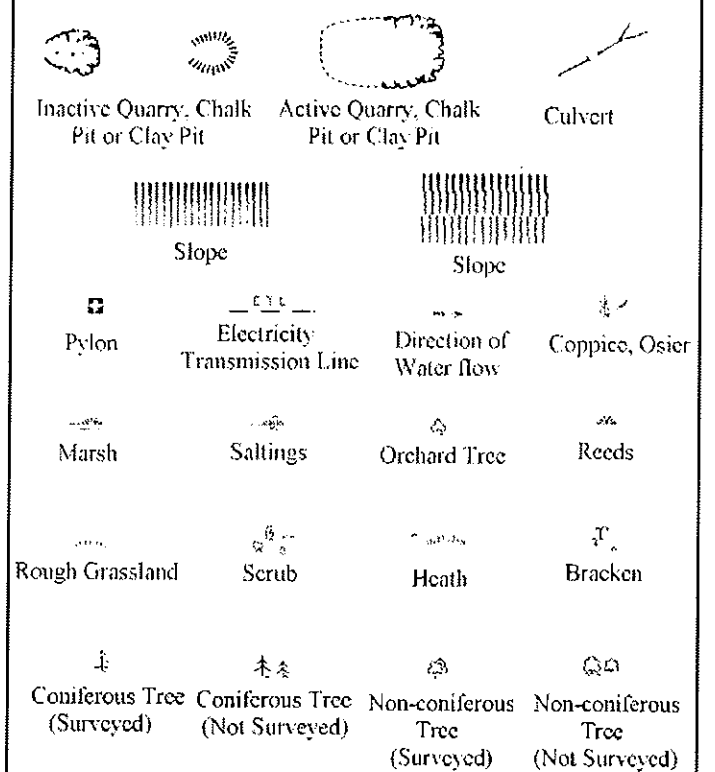


CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2008 15:45)
Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol

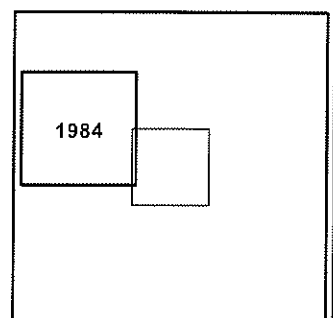
Bristol City
Bristol BS3 2BA

Historical Map Legend



Additional SIMs 3
The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

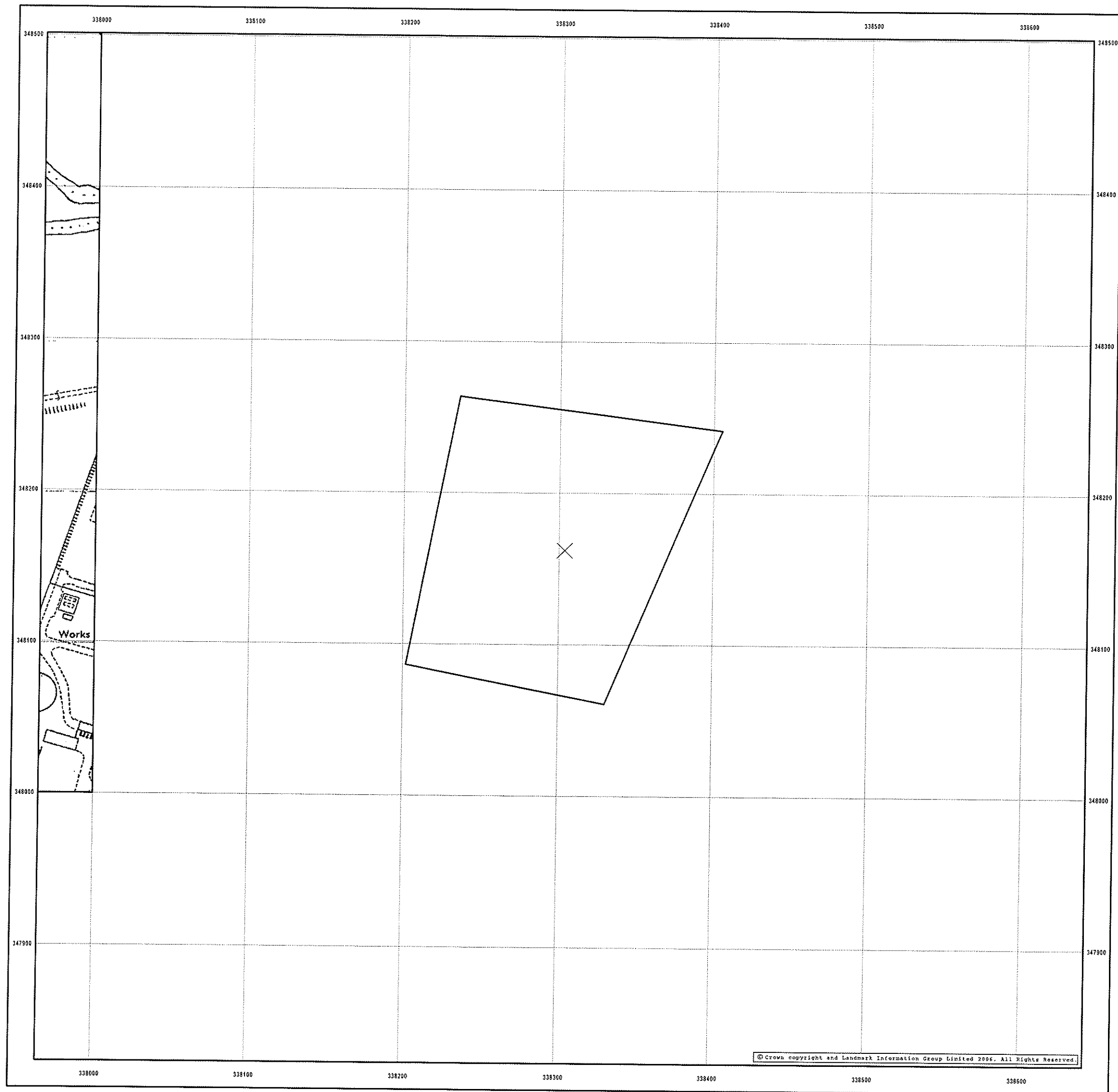
ORDNANCE SURVEY PLAN
Published 1984
Source map scale - 1:2,500



Date(s) of Publication 7 of 24



Produced by Landmark Information Group Limited. Tel: 0870 850 6670 Fax: 0870 850 6671



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(10-Apr-2006 15:48)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

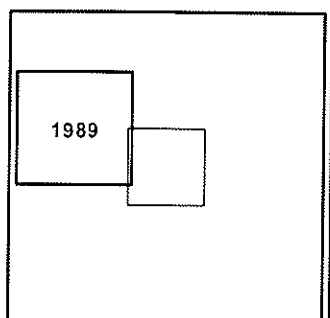
Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert	
Slope	Slope		
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier
Marsh	Saltings	Orchard Tree	Reeds
Rough Grassland	Scrub	Heath	Bracken
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)

Additional SIMs

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

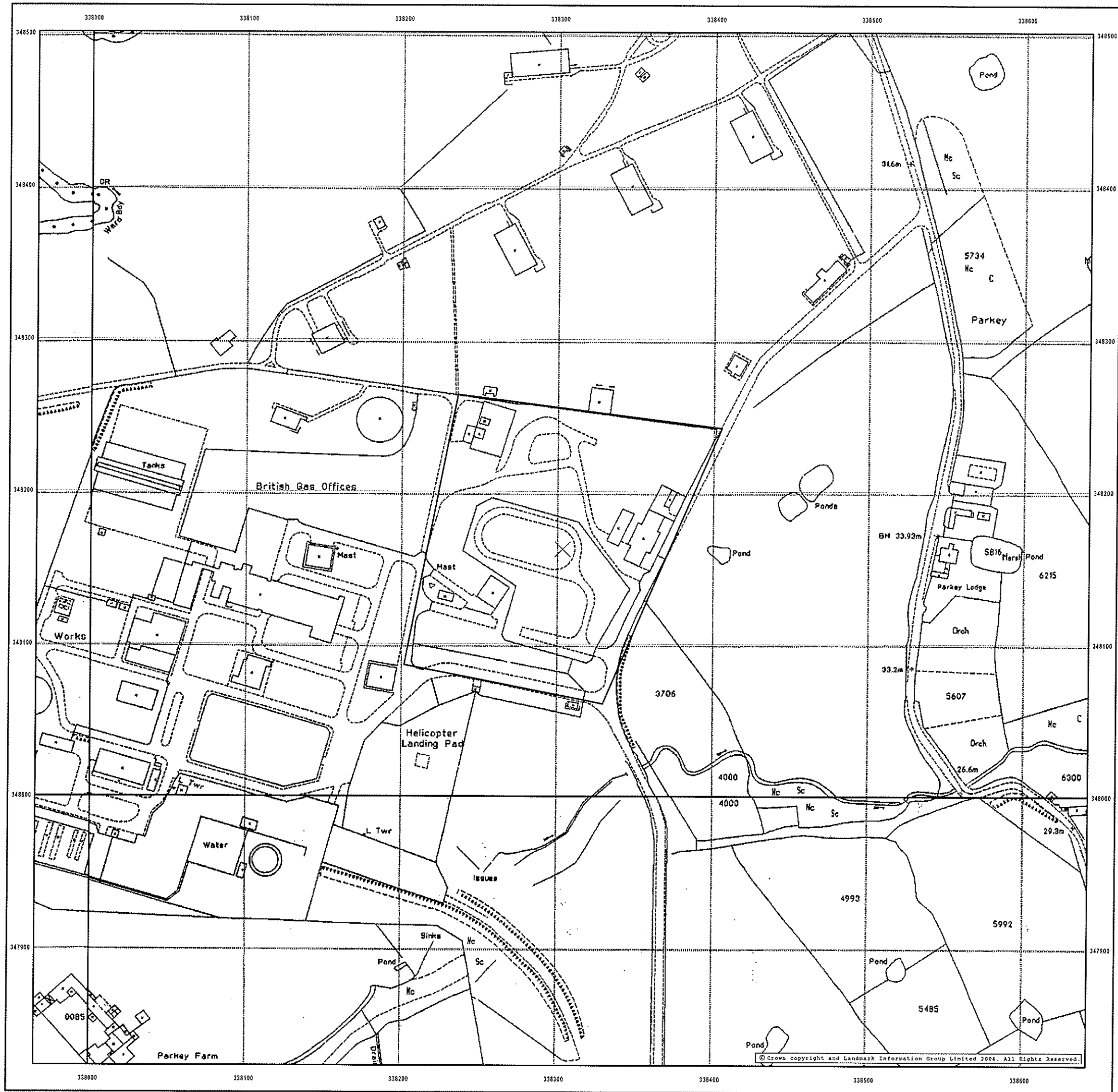
ORDNANCE SURVEY PLAN
Published 1989
Source map scale - 1:2,500



Date(s) of Publication 5 of 24



Produced by Landmark Information Group Limited, Tel: 0870 850 6670 Fax: 0870 850 6671



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(22-Apr-2004 15:45)

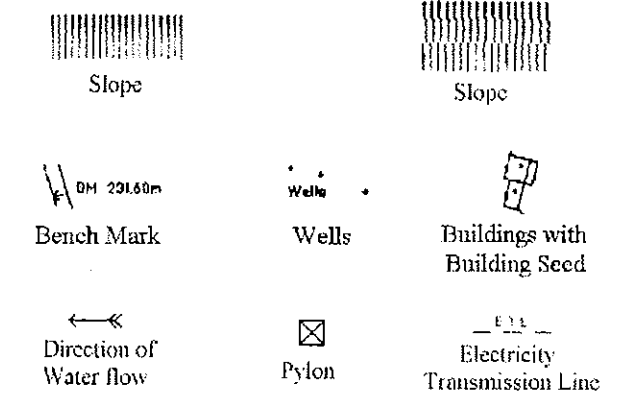
Customer Ref: C Coldrey,50065-25
Komet Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



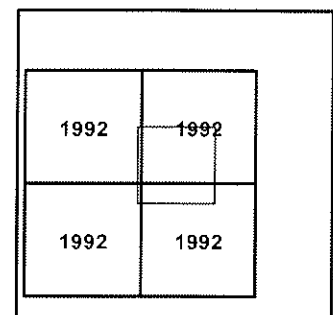
Administrative Boundaries

- • • • • Civil parish/community boundary
- — — District boundary
- • — County boundary
- Boundary post/stone
- Boundary mering symbol (note: these always appear in opposed pairs or groups of three)

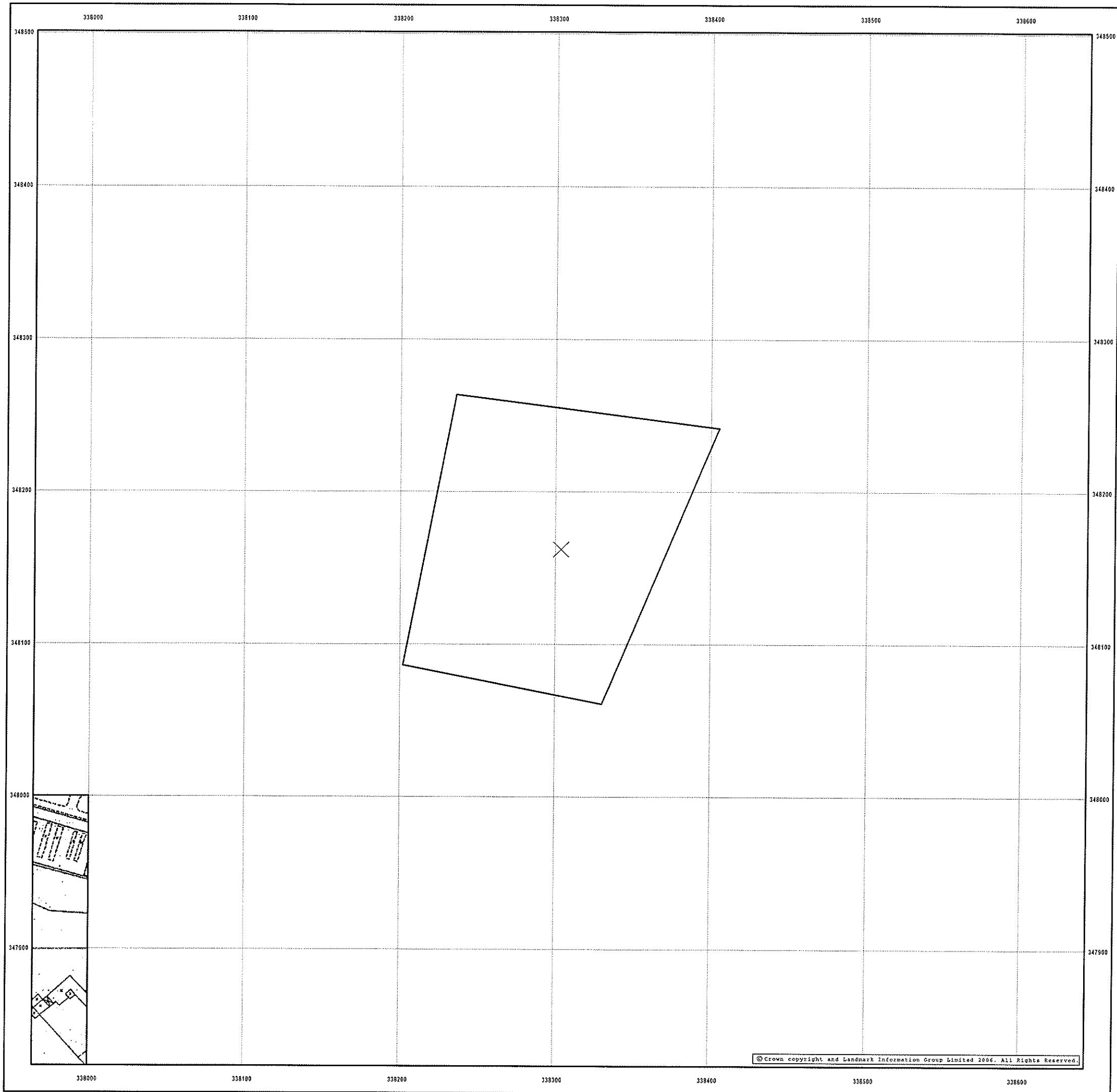
Large-Scale National Grid Data

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

ORDNANCE SURVEY PLAN
Published 1992
Source map scale - 1:2,500



Date(s) of Publication 9 of 24

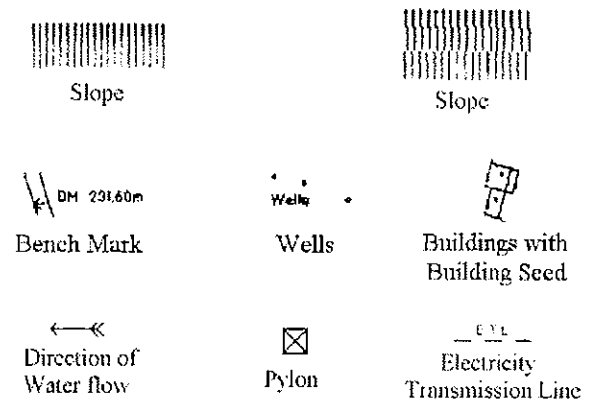


CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2008 15:47)
Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



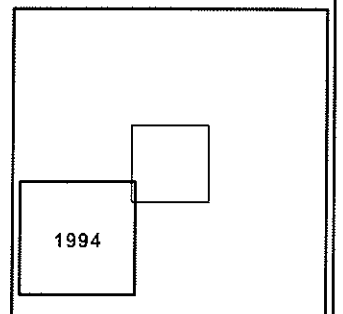
Administrative Boundaries

- • • • • Civil parish/community boundary
- — — District boundary
- * — County boundary
- Boundary post/stone
- Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

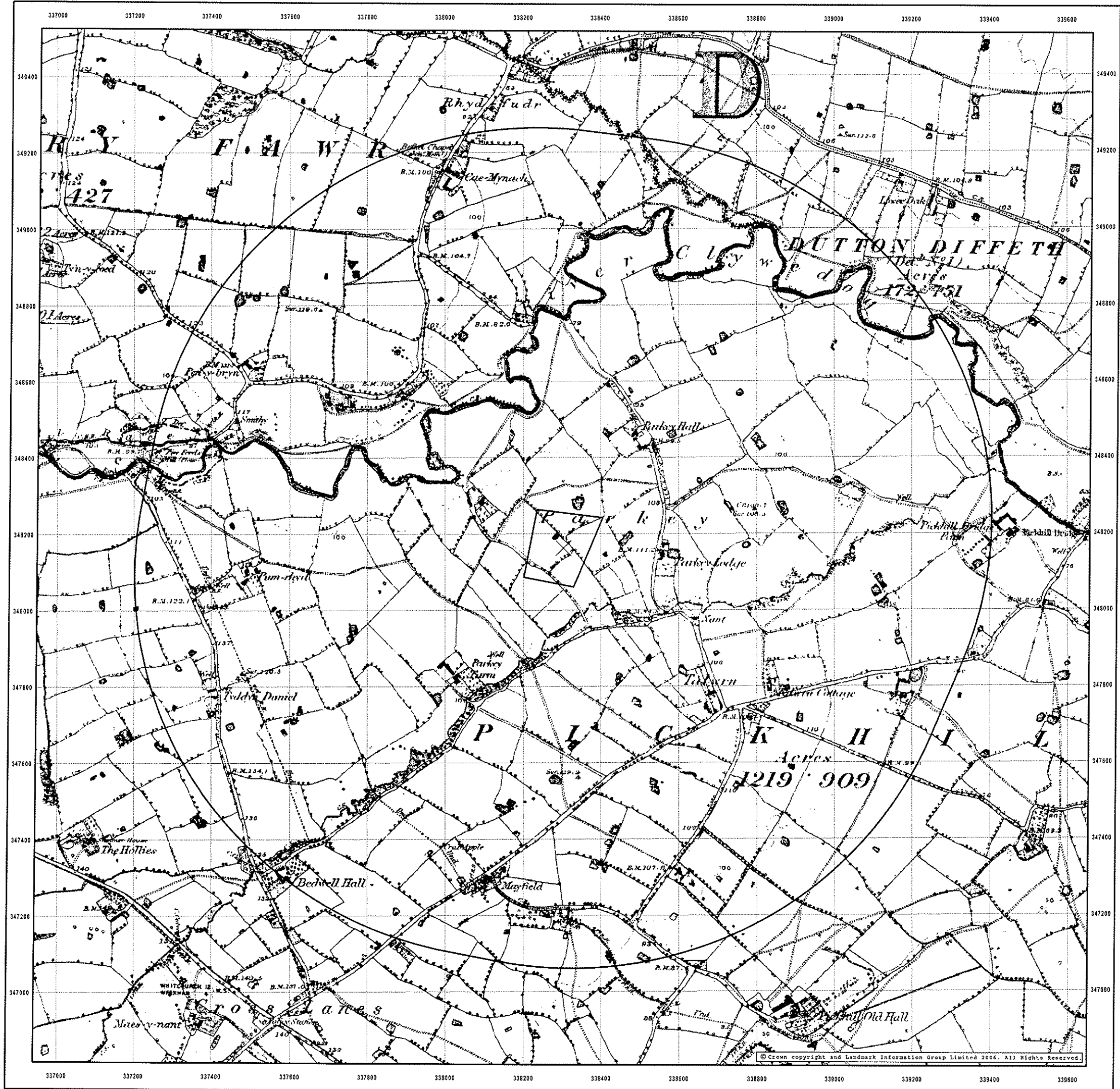
Large-Scale National Grid Data

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

ORDNANCE SURVEY PLAN
Published 1994
Source map scale - 1:2,500



Date(s) of Publication 10 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:47)

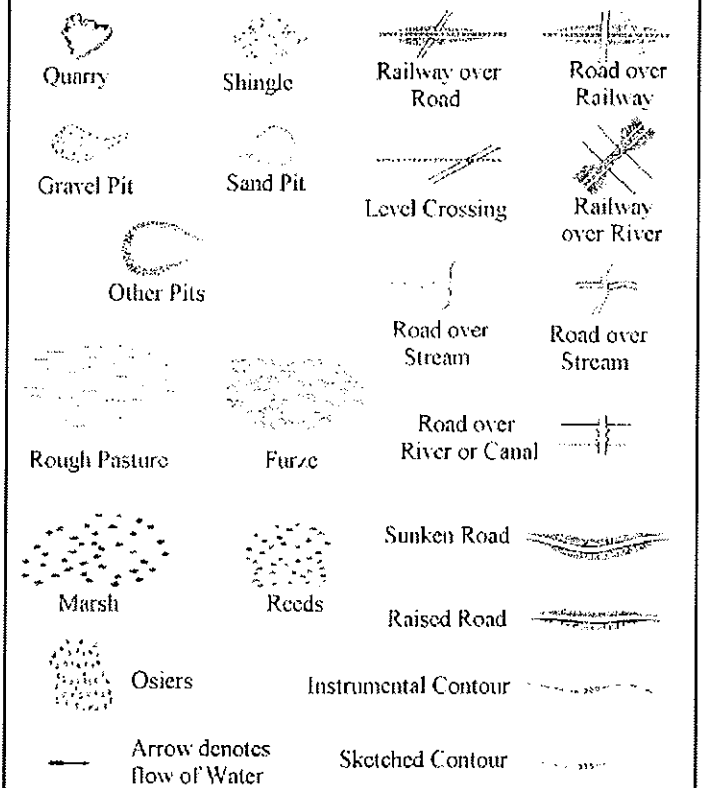
Customer Ref: c Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



Ordnance Survey County Series

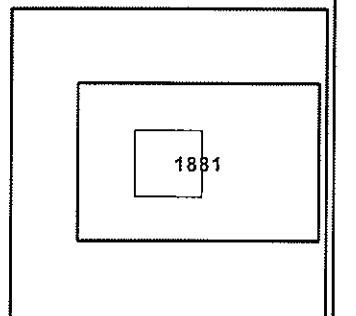
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

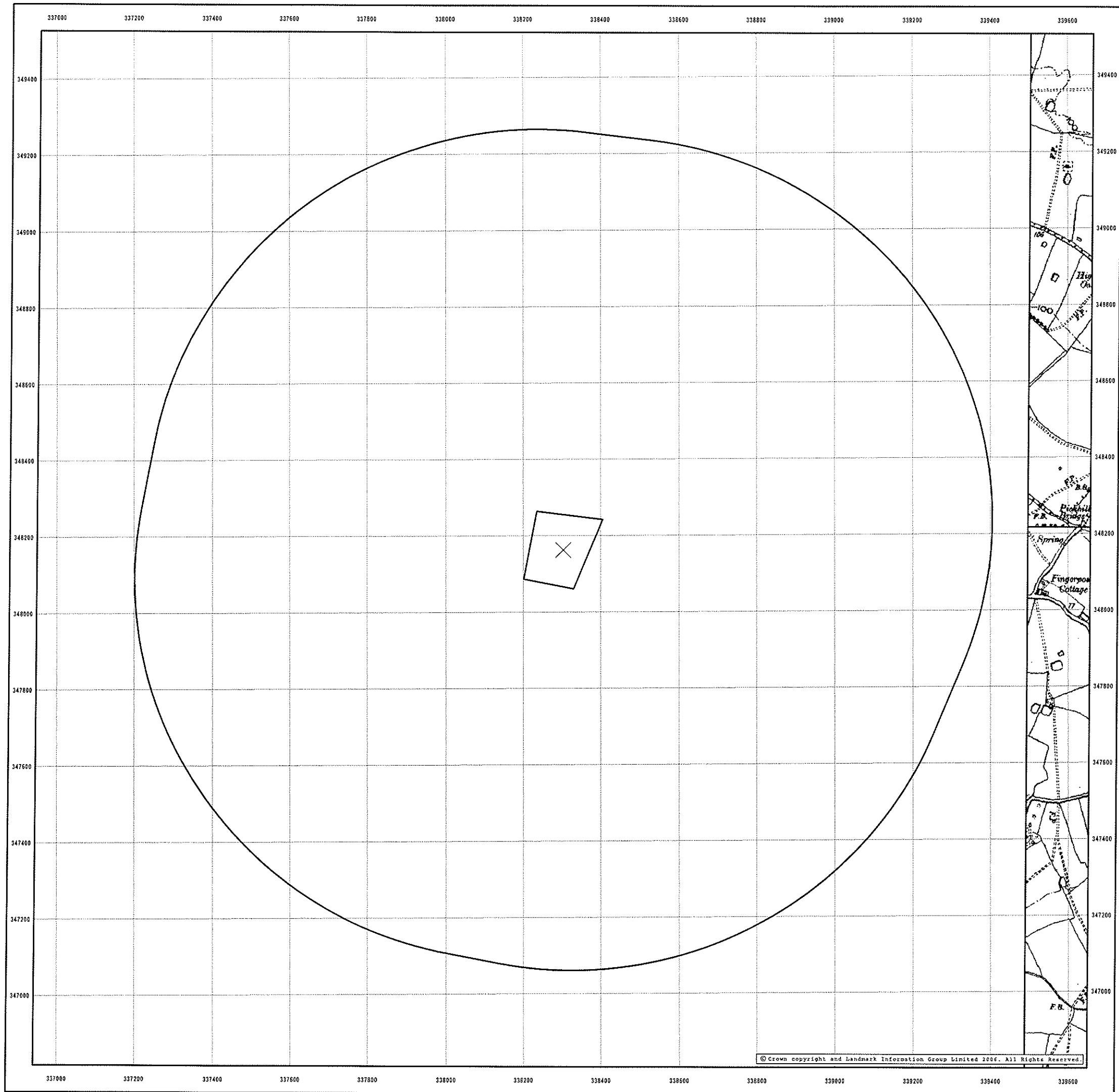
CHESHIRE

Published 1881

Source map scale - 1:10,560



Date(s) of Publication 11 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:47)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	Instrumental Contour
Osiers		Arrow denotes flow of Water	Sketched Contour

Ordnance Survey County Series 2

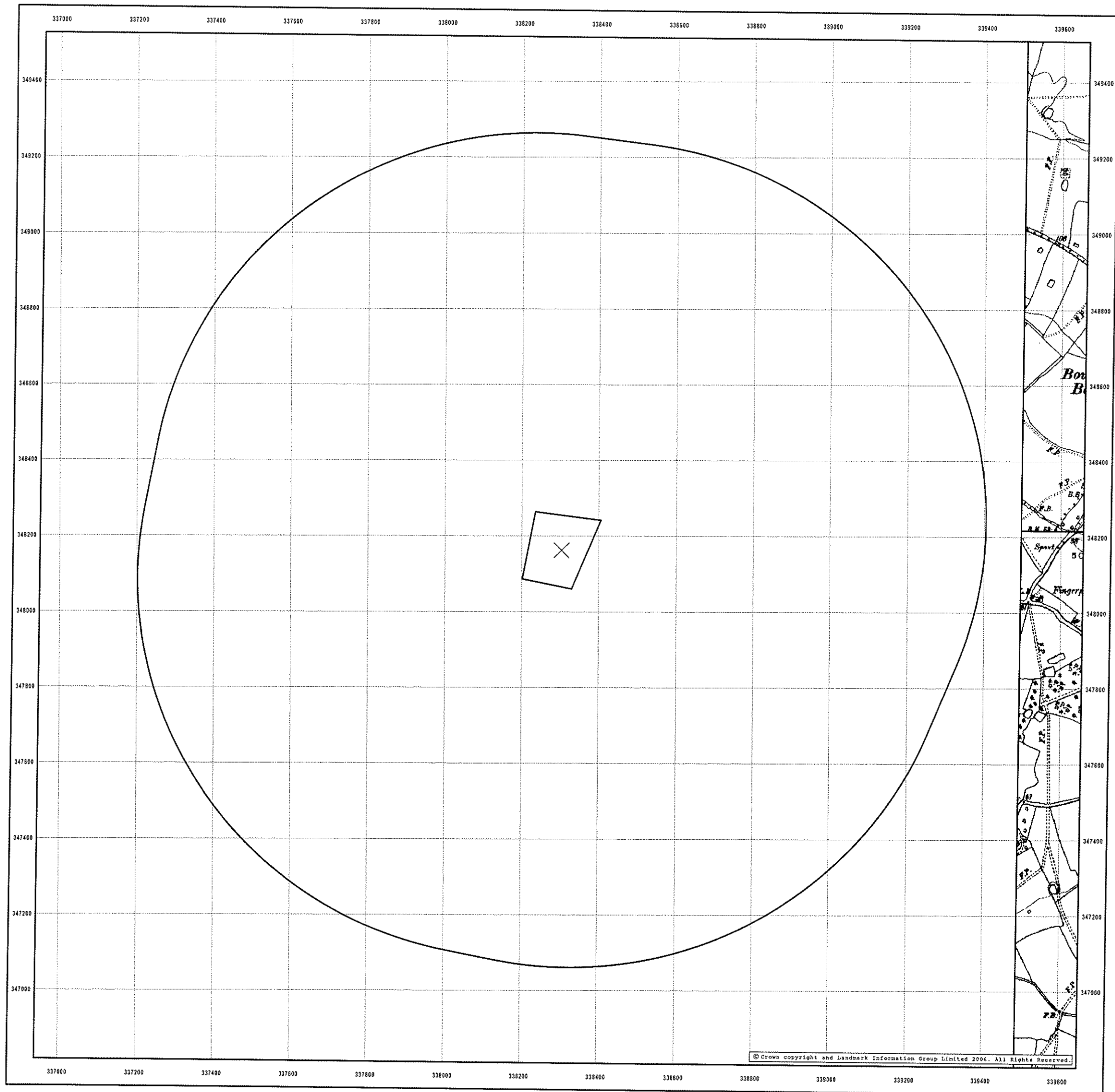
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

CHESHIRE
Published 1899 to 1900
Source map scale - 1:10,560

	1899
	1900

Date(s) of Publication 12 of 24



CLIENT DETAILS Envirocheck Order No. **EC19305141_1_1**
(10-Apr-2016 15:47)
 Customer Ref: C Coldrey,50065-25
 Komex Clarke Bond
 3-8 Redcliffe Parade West
 Bristol
 BS1 6SP

SITE DETAILS Grid Reference **338300 348160**
 3-8 Redcliffe Parade West
 Bristol
 Bristol City
 Bristol BS3 2BA

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	Instrumental Contour
Osiers		Arrow denotes flow of Water	Sketched Contour

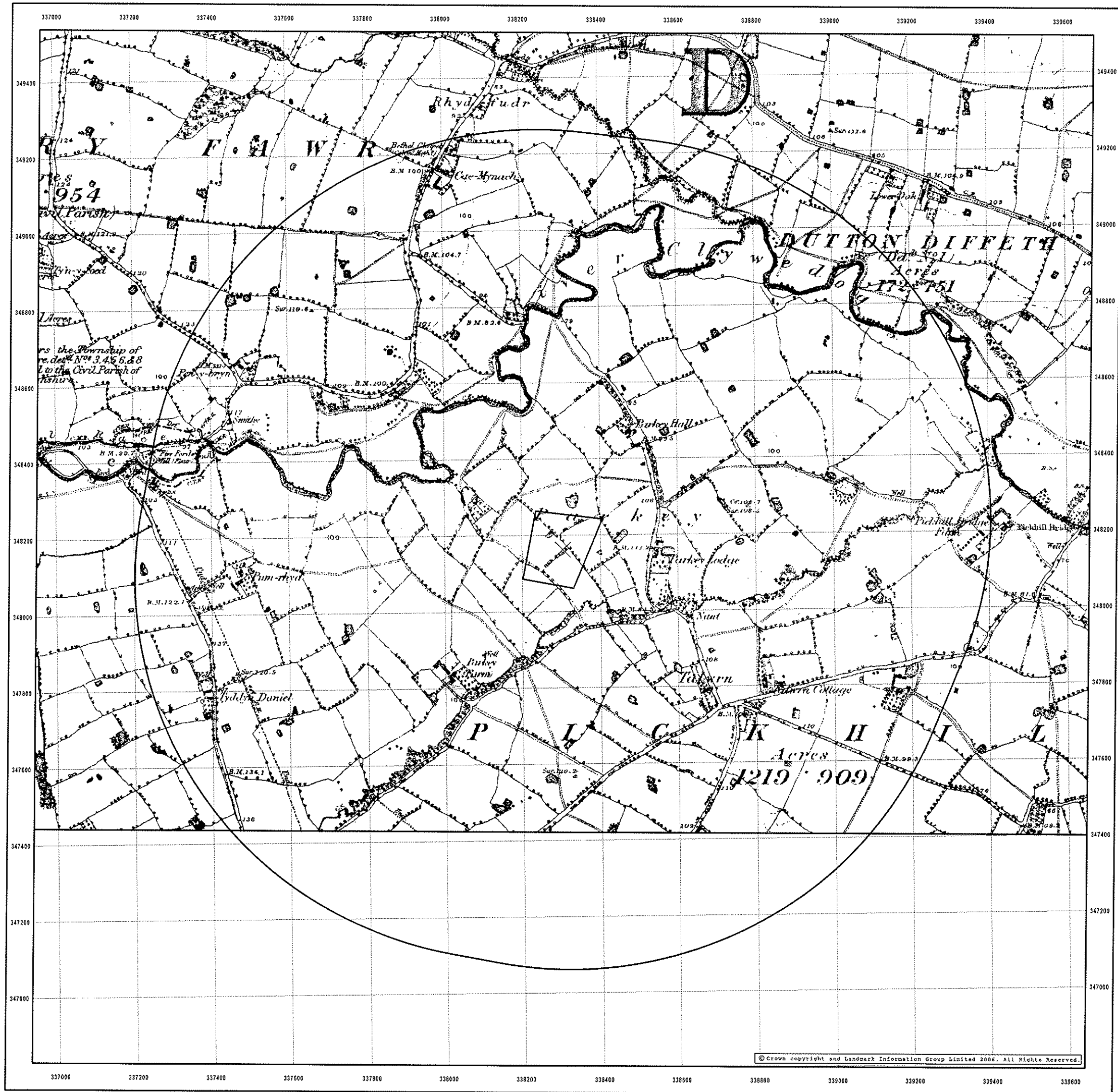
Ordnance Survey County Series 3
 The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
 In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

CHESHIRE
 Published 1913 to 1914
 Source map scale - 1:10,560

1913

1914

Date(s) of Publication 13 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

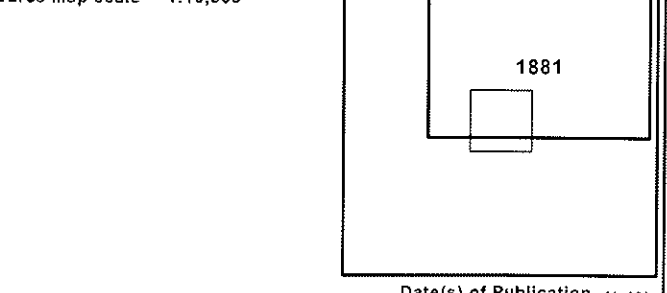
SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

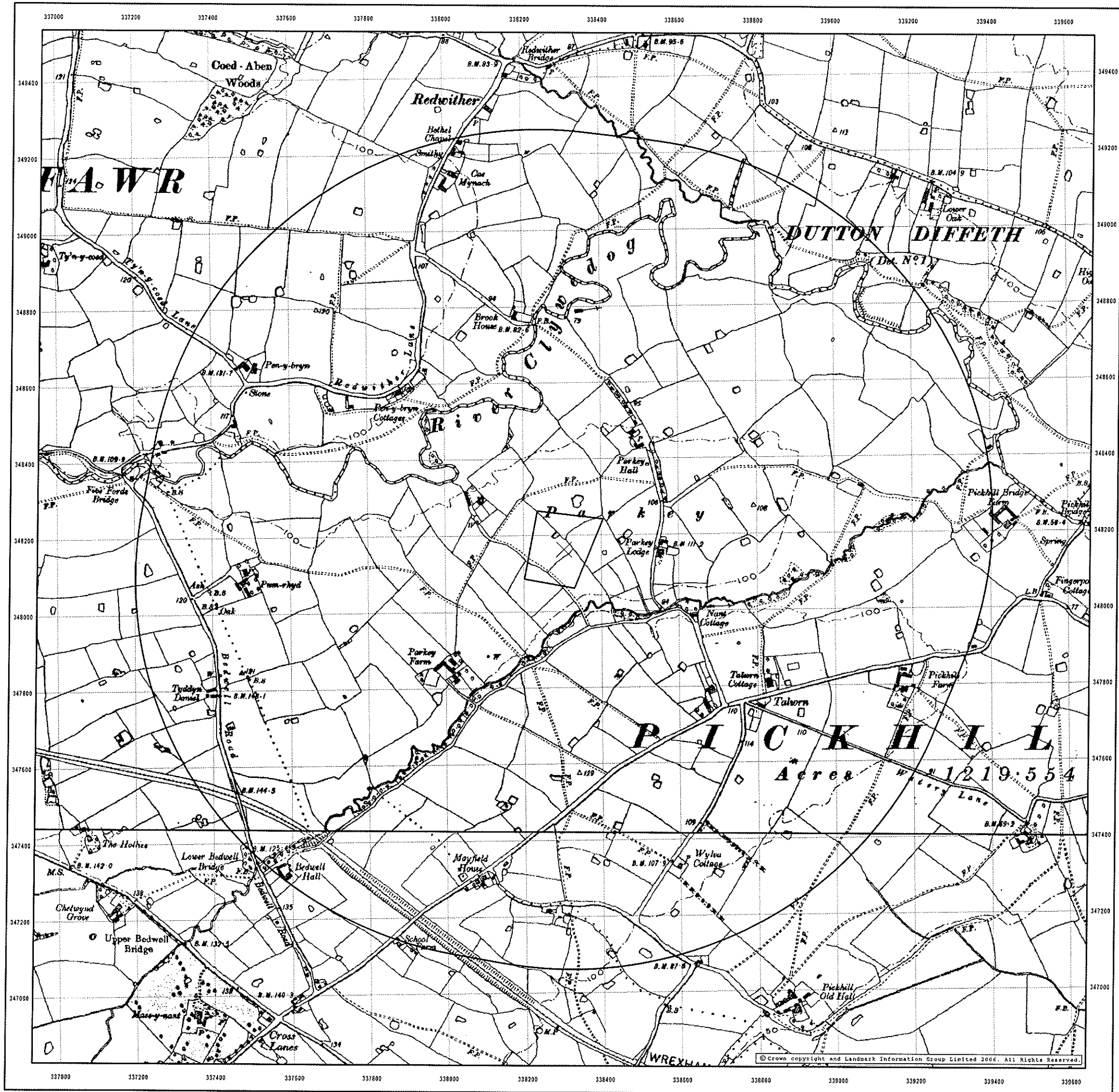
Historical Map Legend

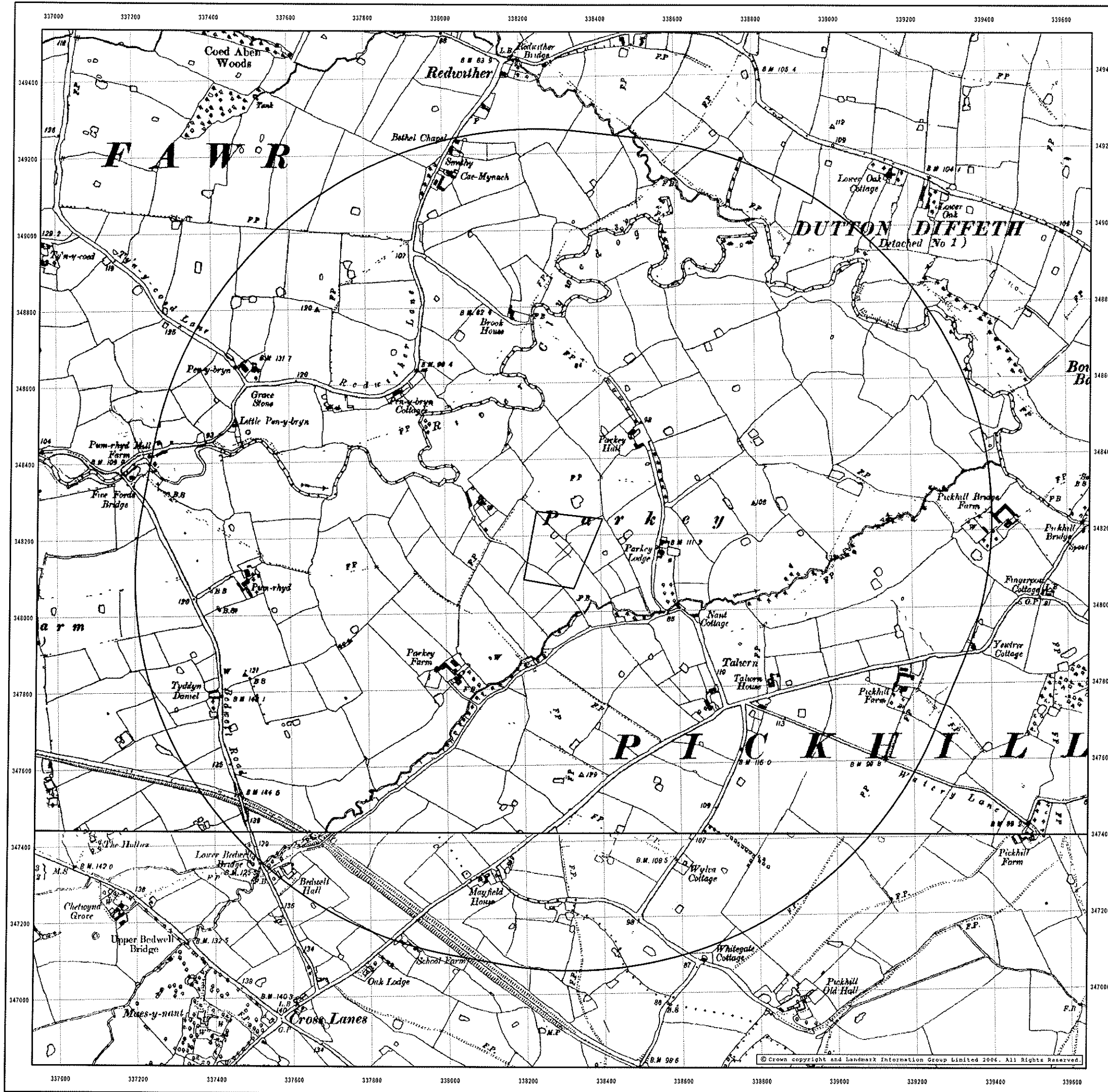
Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	
Marsh	Reeds	Sunken Road	
Osiers		Raised Road	
		Instrumental Contour	
Arrow denotes flow of Water		Sketched Contour	

Ordnance Survey County Series
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

DENBIGHSHIRE
Published 1881
Source map scale - 1:10,560







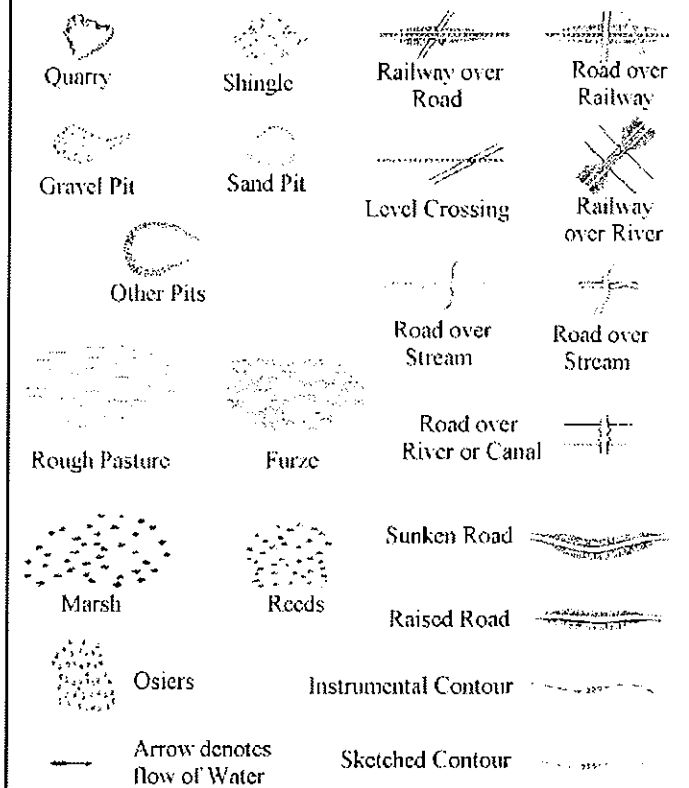
CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:48)

Customer Ref: C Coldrey, 50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

Historical Map Legend



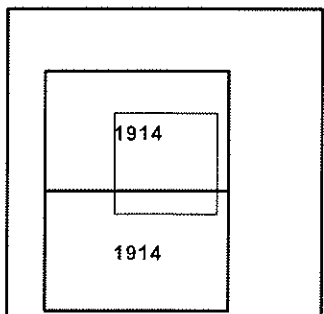
Ordnance Survey County Series

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

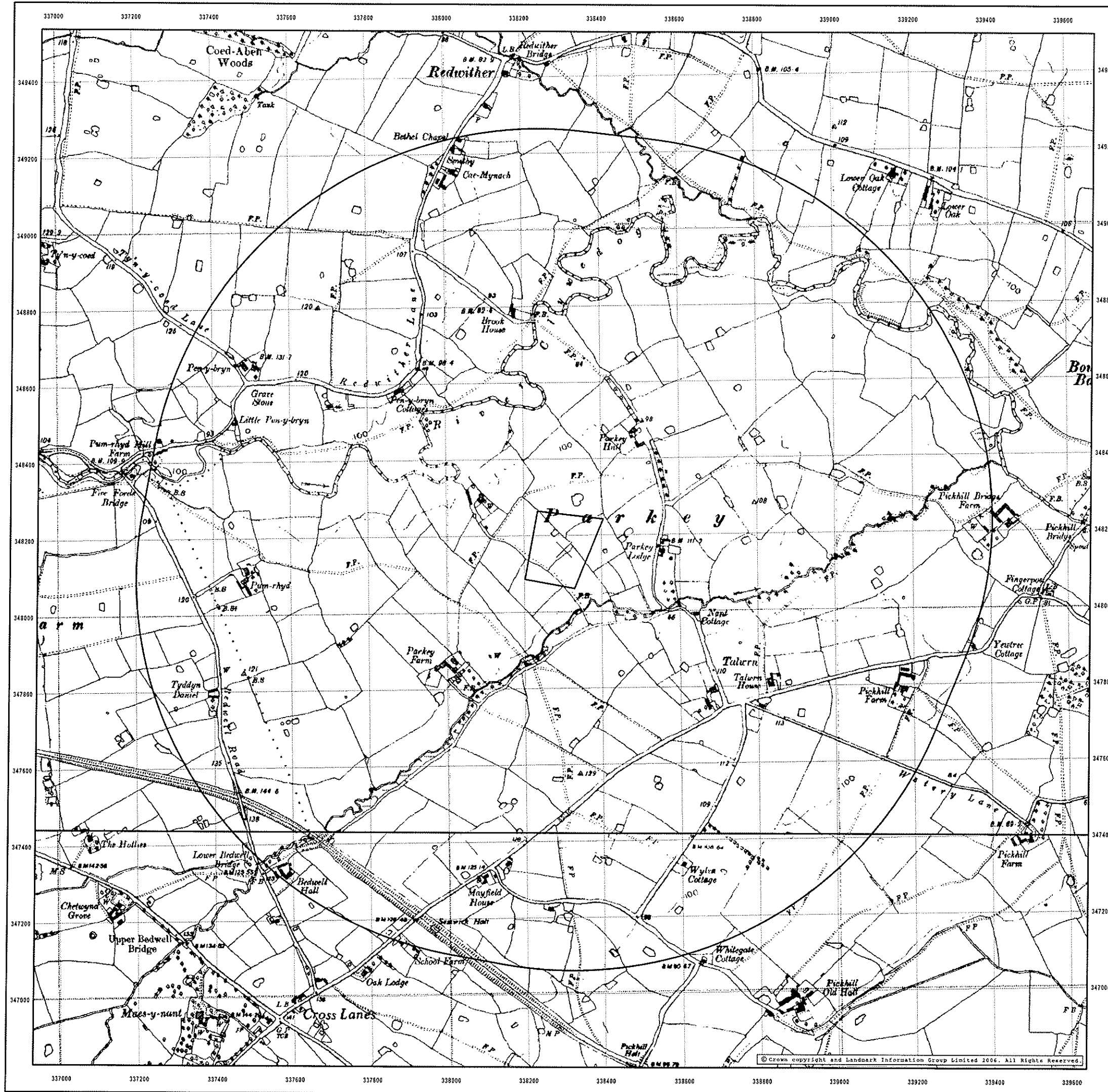
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

DENBIGHSHIRE

Published 1914
Source map scale - 1:10,560



Date(s) of Publication 15 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:43)

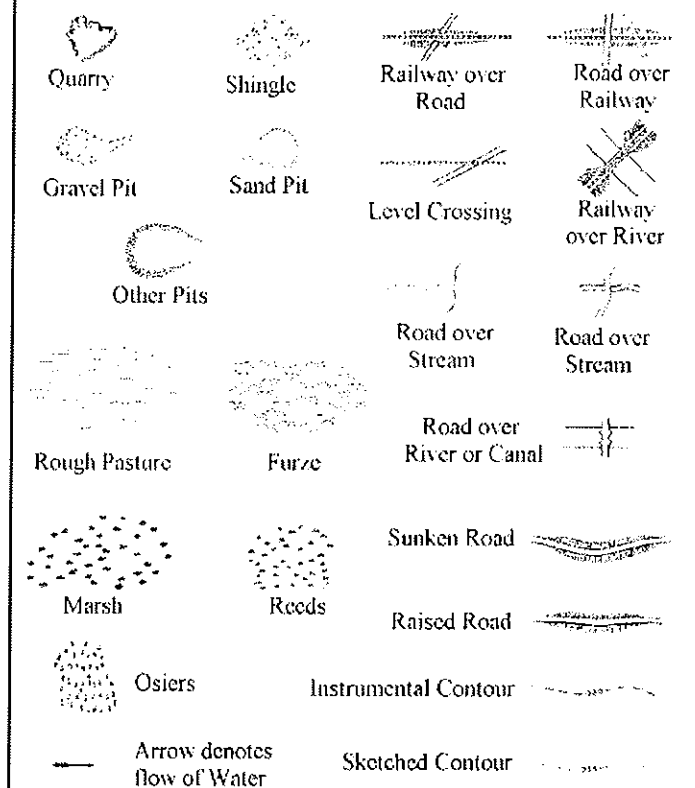
Customer Ref: c Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

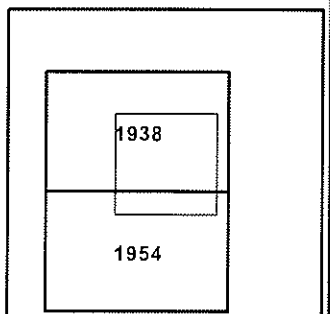


Ordnance Survey County Series

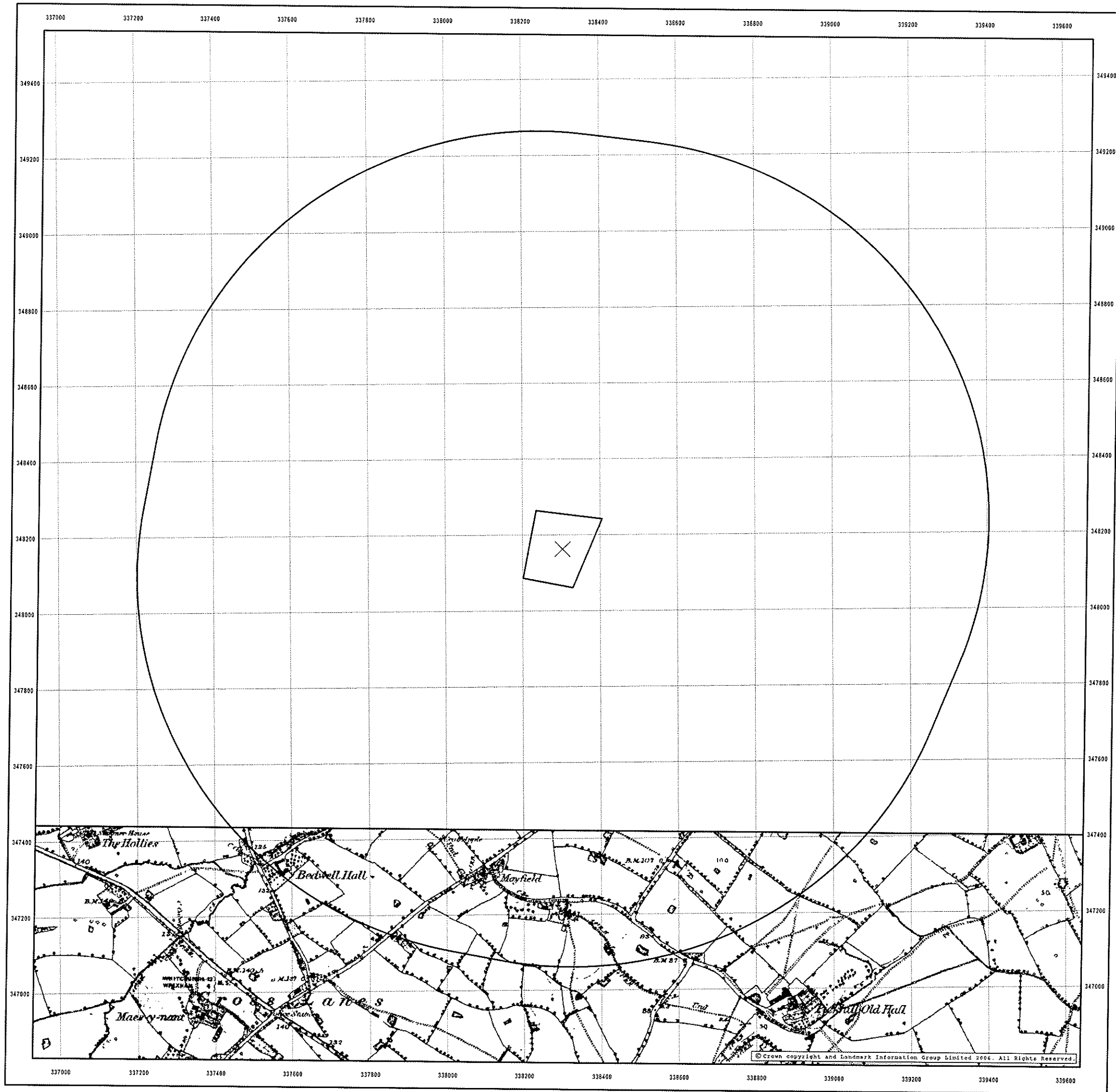
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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DENBIGHSHIRE
Published 1938 to 1954
Source map scale - 1:10,560



Date(s) of Publication 17 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:43)

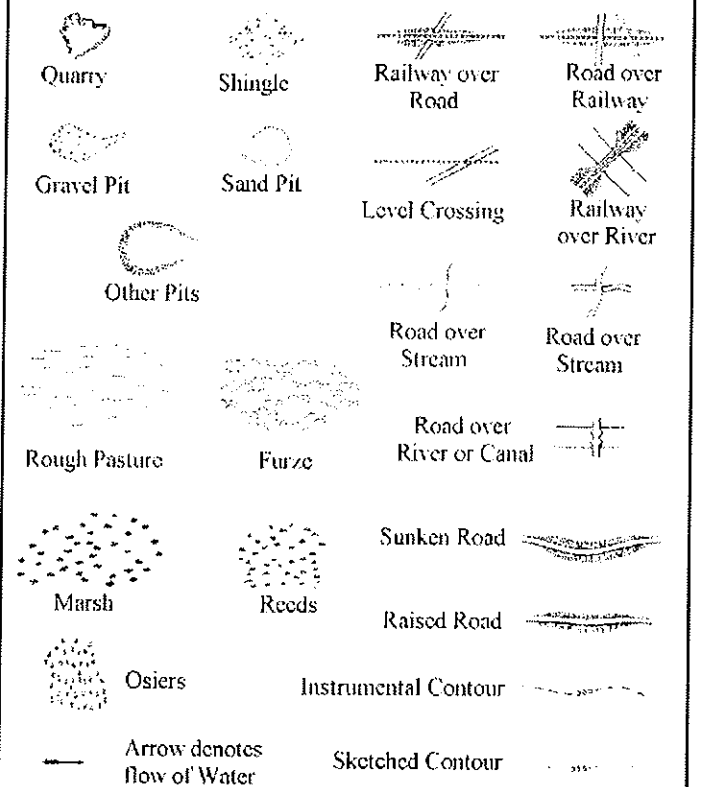
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Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



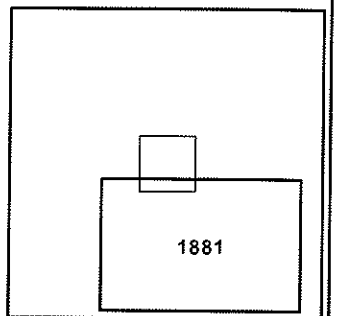
Ordnance Survey County Series

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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FLINTSHIRE

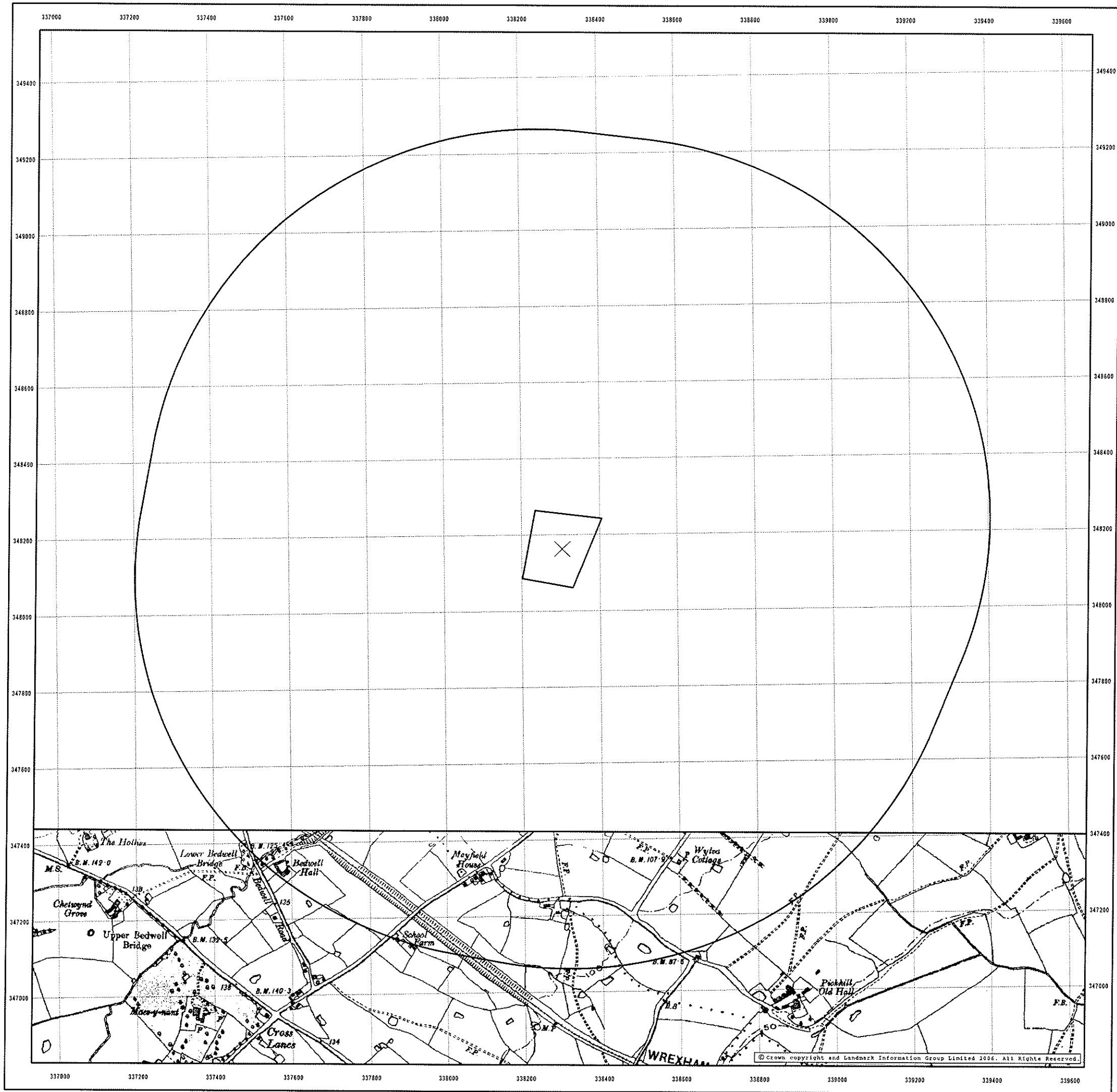
Published 1881
Source map scale - 1:10,560



Date(s) of Publication 18 of 24



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CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
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Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	Instrumental Contour
Osiers		Arrow denotes flow of Water	Sketched Contour

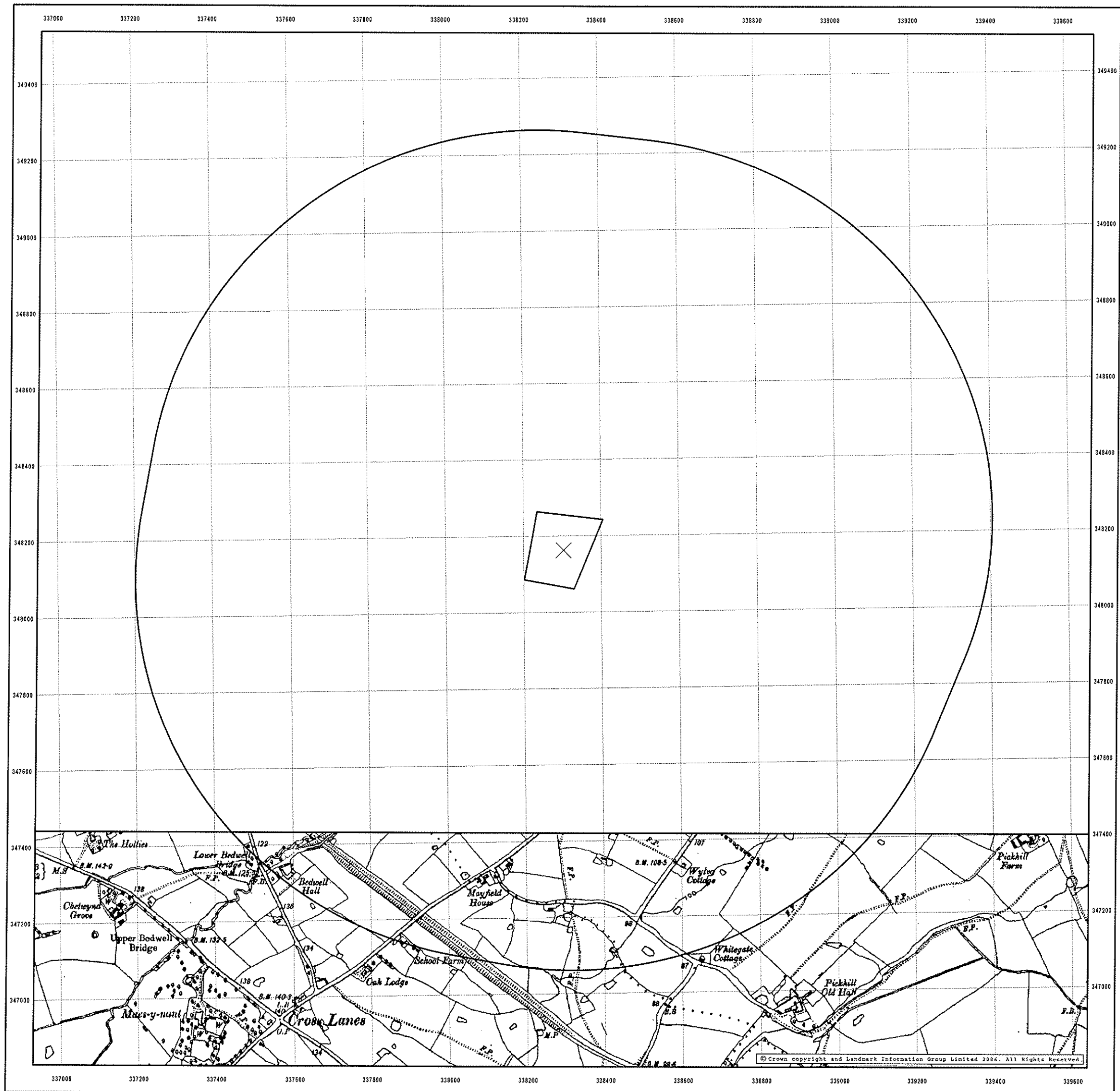
Ordnance Survey County Series 2

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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FLINTSHIRE
Published 1900
Source map scale - 1:10,560

Date(s) of Publication 19 of 24



CLIENT DETAILS Envirocheck Order No. **EC19305141_1_1**
(29-Apr-2006 15:43)

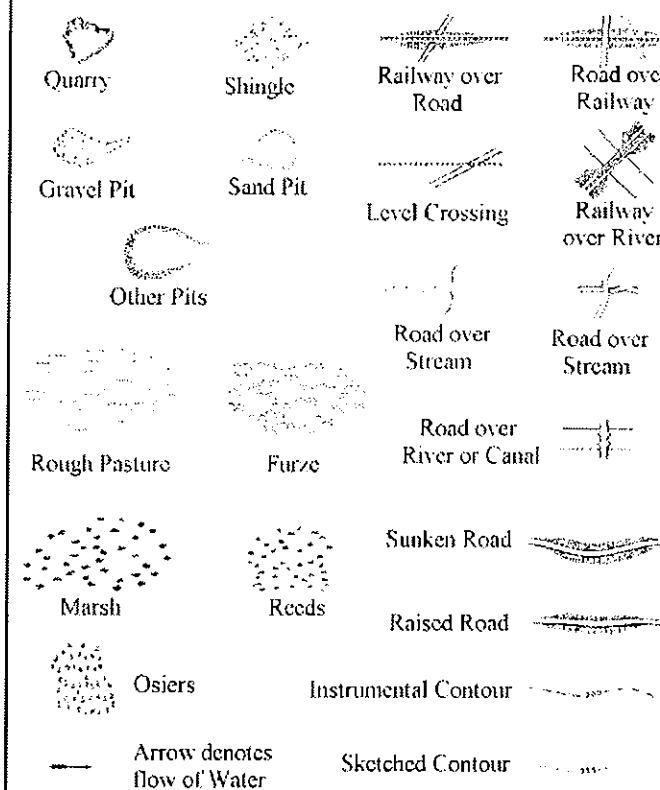
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Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference **338300 348160**

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



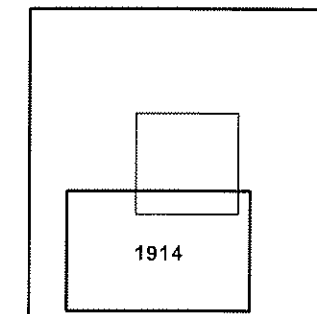
Ordnance Survey County Series

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

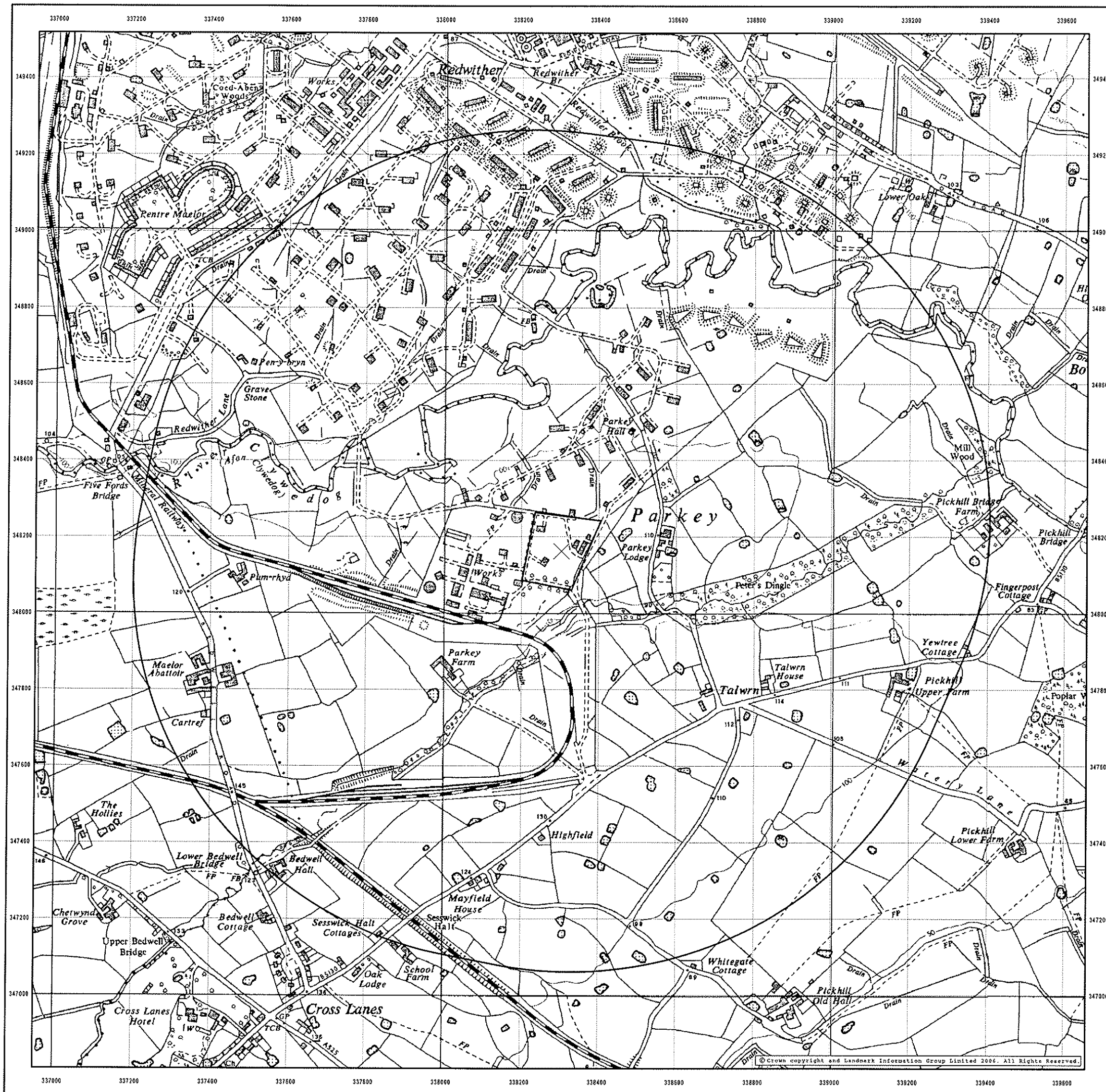
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FLINTSHIRE
Published 1914

Source map scale - 1:10,560



Date(s) of Publication 20 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1

Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend			
	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees
	Gravel Pit		Coniferous Trees
	Sand Pit		Scrub
	Disused Pit or Quarry		Lake, Loch or Pond
	Refuse or Slag Heap		Pylen
	Direction of Flow of Water		Electricity
	Cutting		Pole
	Embankment		Transmission Line
	Road Under		Marsh
	Road Over		Shingle
	Level Crossing		Sand
	Foot Bridge		Standard Gauge Multiple Track
	Siding, Tramway or Mineral Line		Standard Gauge Single Track
	Narrow Gauge		Siding, Tramway or Mineral Line

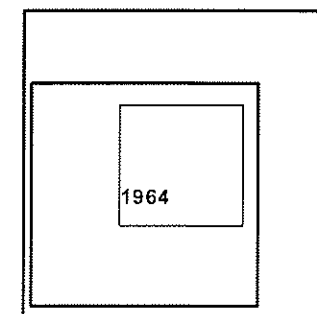
Ordnance Survey Plan

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

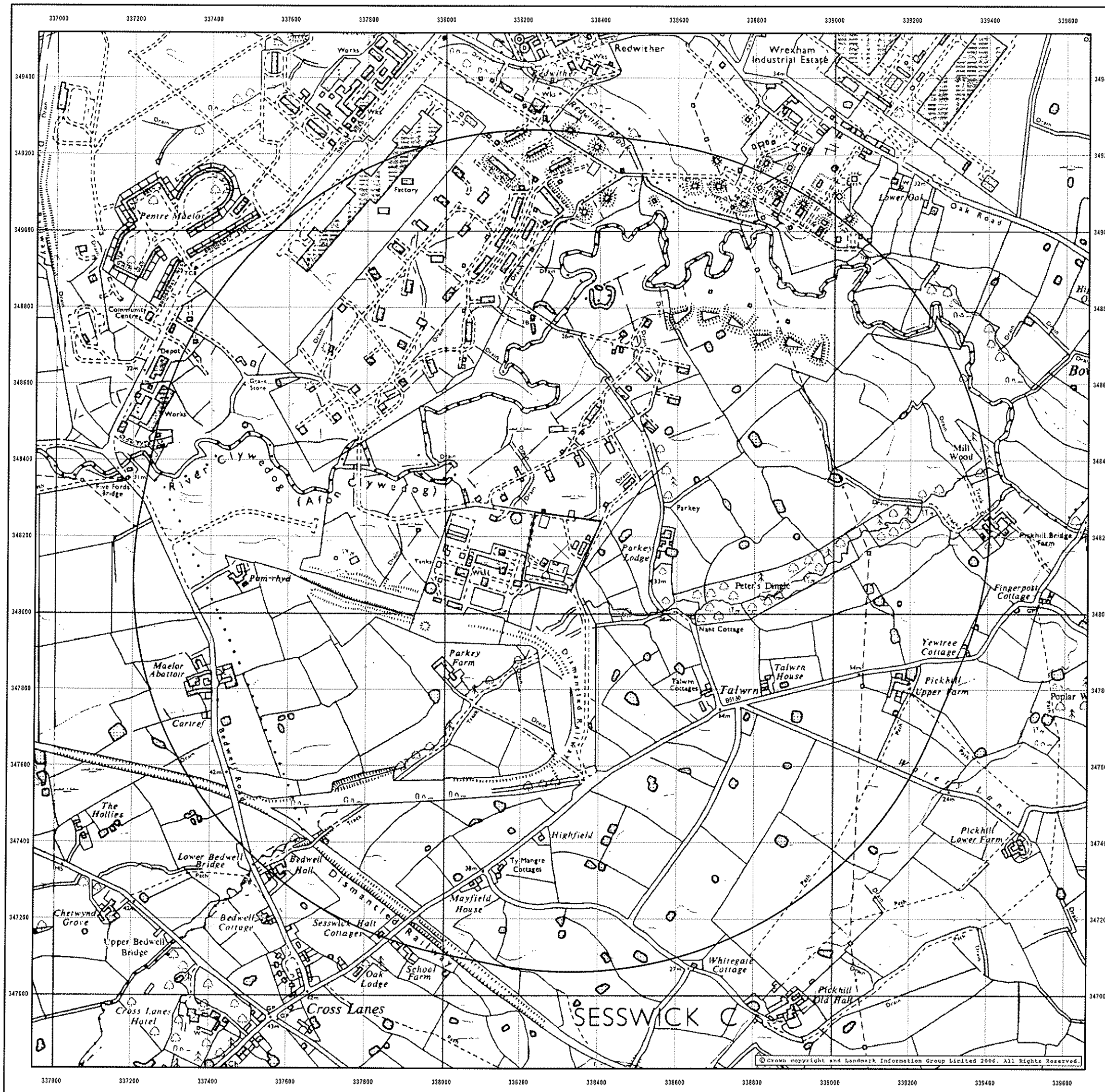
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

ORDNANCE SURVEY PLAN
Published 1964

Source map scale - 1:10,560



Date(s) of Publication 21 of 24



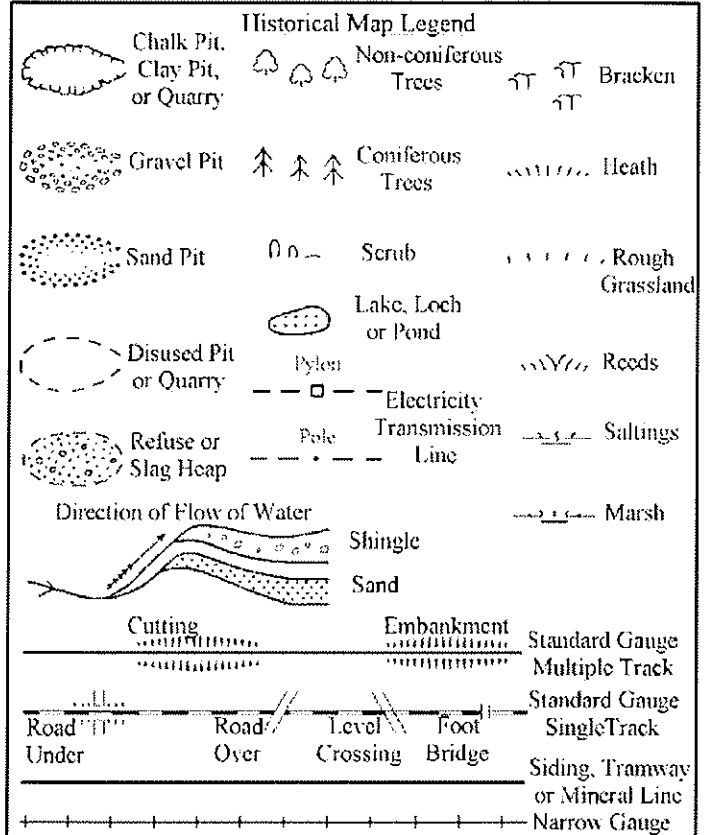
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Customer Ref: C Coldrey, 50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA



Ordnance Survey Plan 1

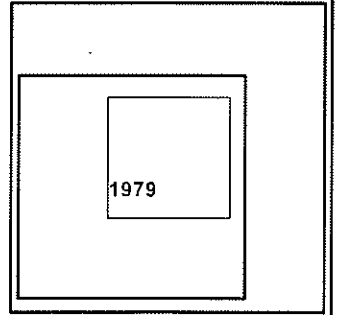
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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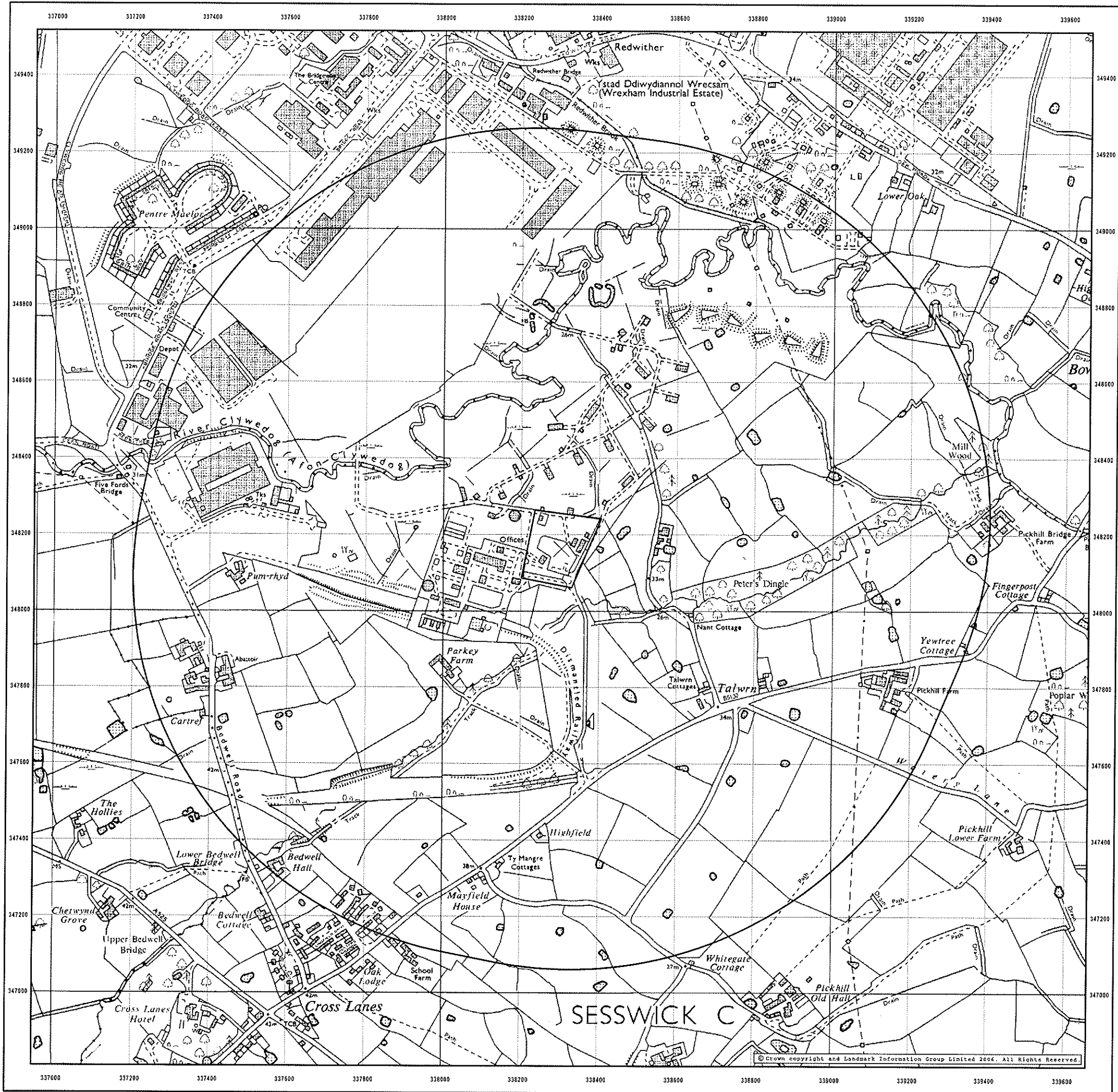
ORDNANCE SURVEY PLAN

Published 1979

Source map scale - 1:10,000



Date(s) of Publication 22 of 24



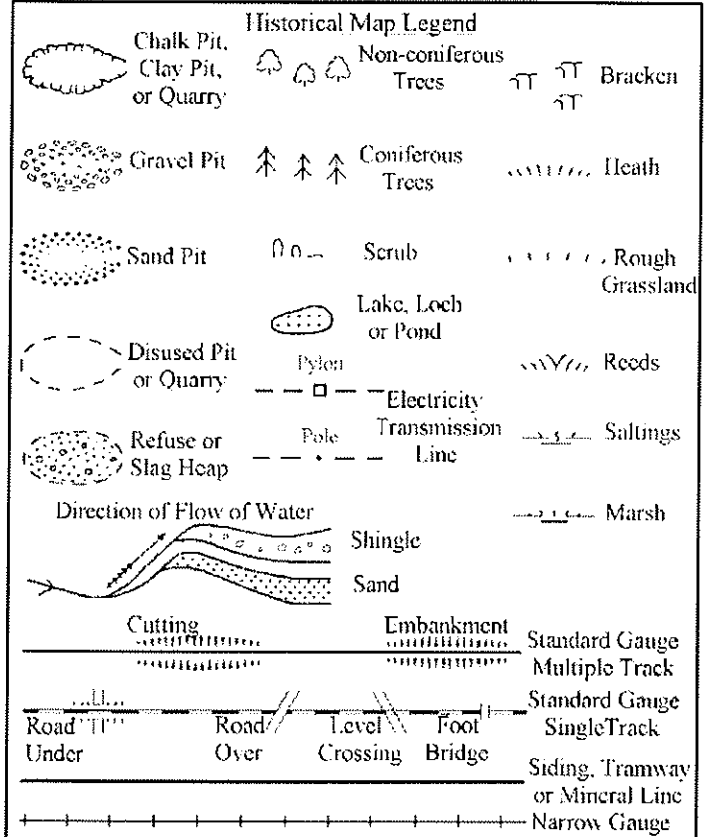
CLIENT DETAILS Envirocheck Order No. **EC19305141_1_1**
(10-Apr-2006 15:59)

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Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference **338300 348160**

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA



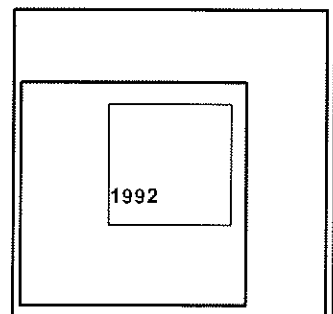
Ordnance Survey Plan

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

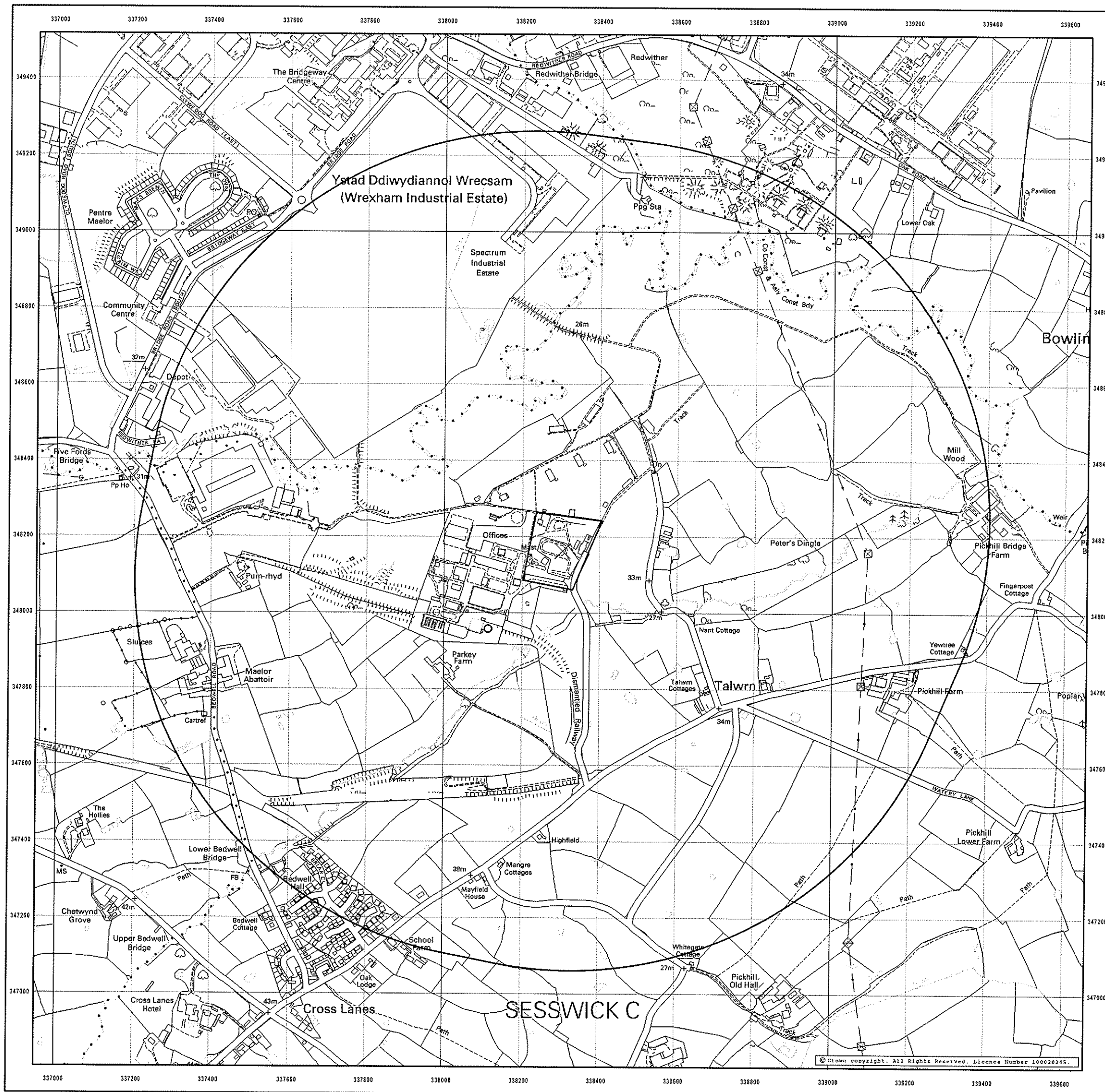
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

ORDNANCE SURVEY PLAN
Published 1992

Source map scale - 1:10,000



Date(s) of Publication 23 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(70-Apr-2006 15:50)

Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS	Grid Reference	338300	348160
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3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

	Non-coniferous Trees		Pylon
	Coniferous Trees		Telephone Line (where shown)
	Orchard		Electricity Transmission Line (with poles)
	Rough Grassland		Gravel Pit
	Heath		Shingle
	Scrub		Refuse Tip or Slag Heap
	Marsh, Salt Marsh or Reeds		Sand
	County Boundary (England only)		Sand Pit
	Civil Parish or Community Boundary		Slopes
	Constituency Boundary		District, Unitary, Metropolitan, London Borough Boundary

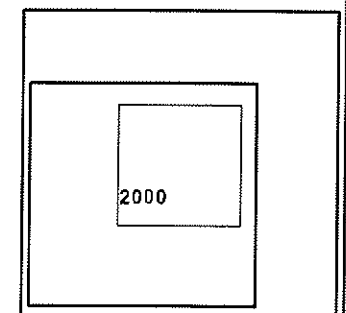
10K Raster Mapping

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Lansplan[®] which replaced the old 1:10,000 maps originally published in 1976.

The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depicts includes county, unitary authority, district, civil parish and constituency.

ORDNANCE SURVEY PLAN
Published 2000

Source map scale - 1:10,000



Date(s) of Publication 24 of 24



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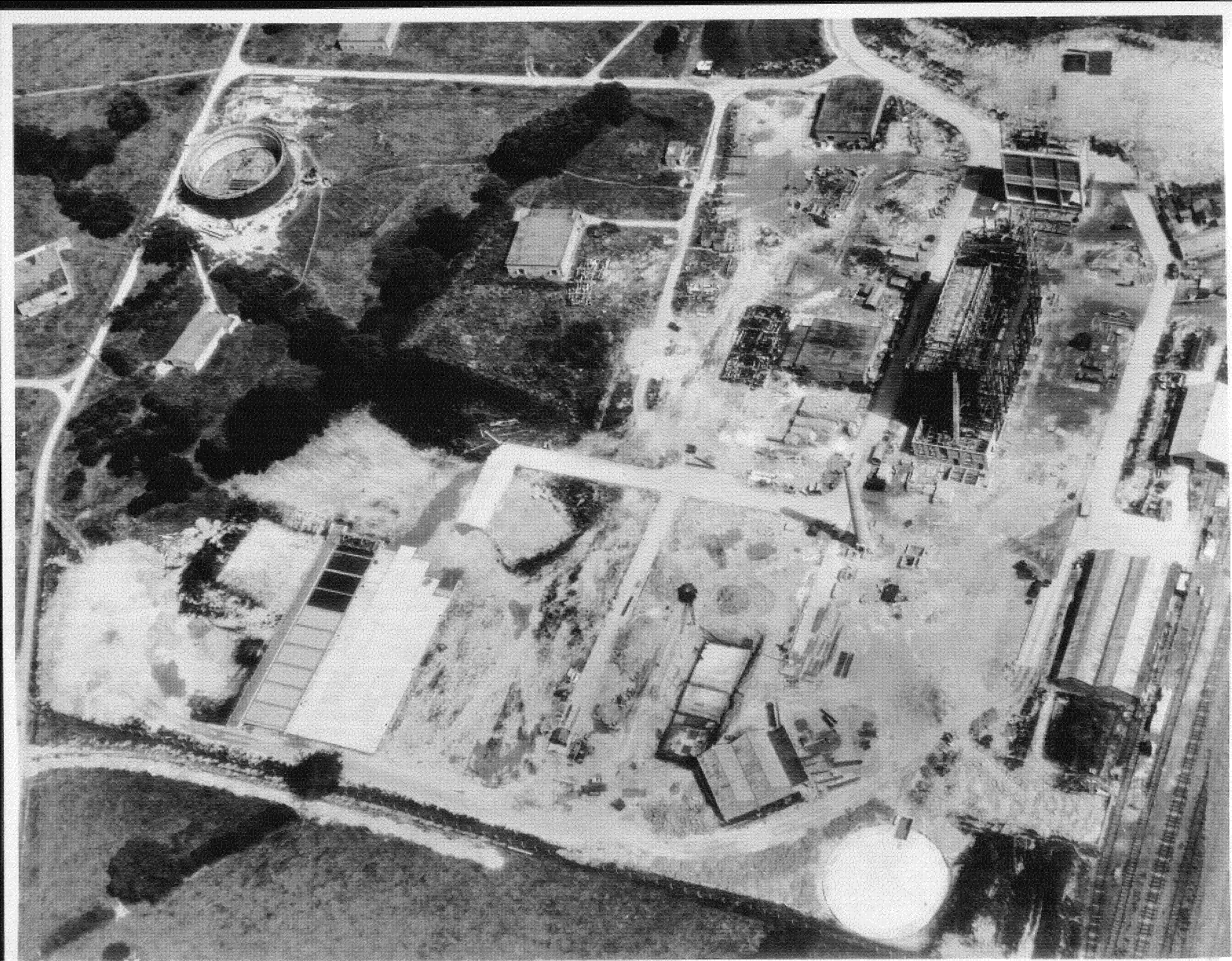
Cross Lanes

Bowling

Talwrn

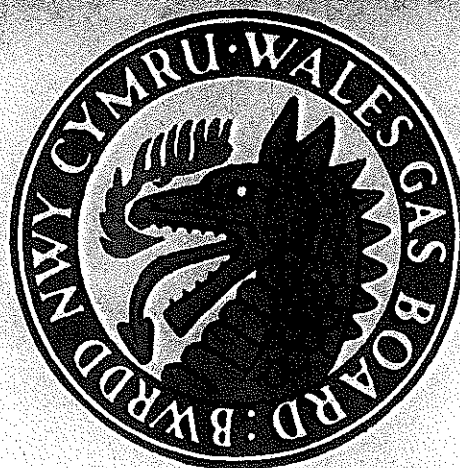
~~Ystad Ddiwydiannol Wrecsam~~
(Wrexham Industrial Estate)











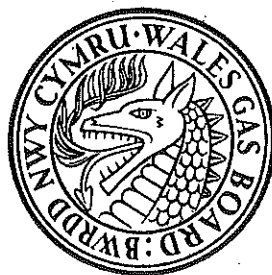
WREXHAM UNDERTAKING

OFFICIAL OPENING
OF
MAELOR GAS WORKS

BY THE
LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for
the Home Department and Welsh Affairs



14TH OCTOBER, 1953



WREXHAM UNDERTAKING



14TH OCTOBER, 1953

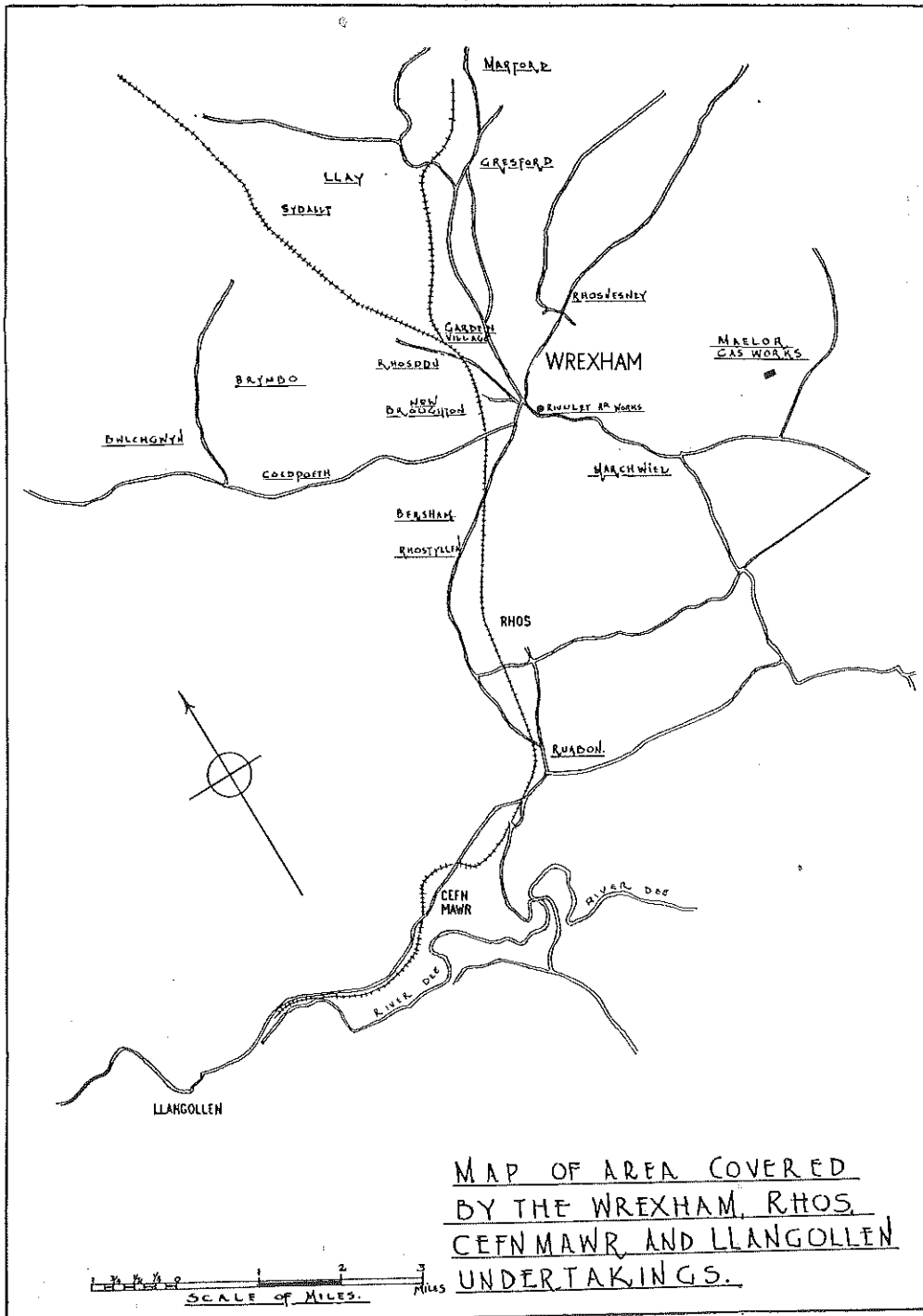
R. H. JOHNS LTD.
NEWPORT . MON.



THE LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for the Home Department and Welsh Affairs



MR. J. F. LLOYD, M. INST. GAS. E.
Engineer and Manager, Wrexham Undertaking



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HISTORY

GAS was first introduced in Wrexham in 1827 when Messrs. Keay, Edwards and Company provided gas lighting. In 1839 the Wrexham Gas and Coke Company was formed and took over the assets of the original suppliers at a cost of £705. A new works was then erected in Willow Road, total cost of various buildings amounting to £507.

The output of the works increased steadily and in 1869 a larger site was necessary. During the period 1869-70 the whole of the works was transferred to the present site in Rivulet Road. At this time the Company obtained its first Act of Parliament and became a Statutory Company under the name of the Wrexham Gaslight Co., the capital involved being £15,000 and the manufacturing plant consisting of 56 hand-charged horizontal retorts. The second Act of Parliament in 1905 changed its name to the Wrexham Gas Company.

During the years 1902-1907, the works were almost wholly rebuilt, new carbonising plant comprising 72 machine-charged horizontal retorts, purifying plant and a new gasholder of 500,000 cu. ft. capacity being installed.

The distribution side of the Undertaking was expanding rapidly and supplies were now made available to Coedpoeth and Rhostyllen. In 1912 the then new method of high pressure distribution was adopted for supplying outlying villages. By this means Rhosnessey and Gresford were supplied before the outbreak of the 1914-1918 War, whilst the supply to Brymbo was completed shortly after cessation of hostilities.

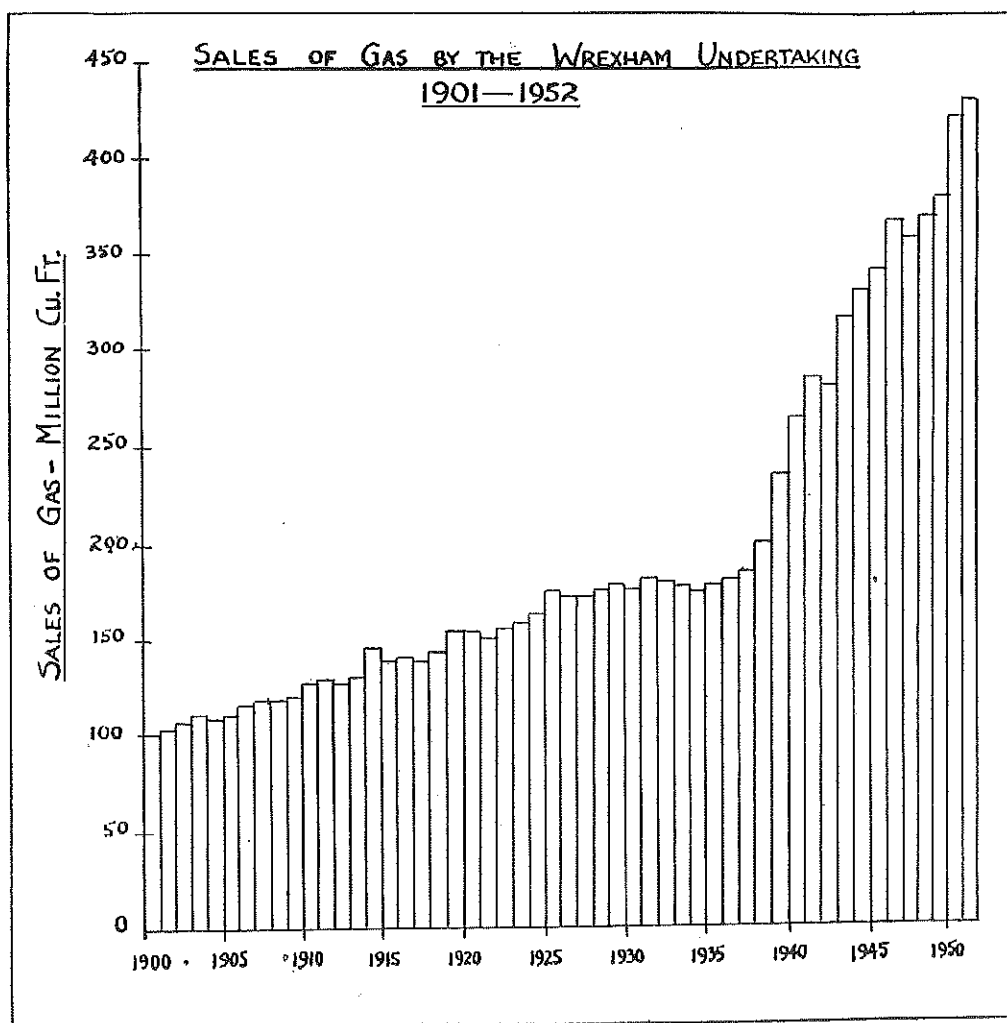
By 1938 the make of gas had increased from the 1900 figure of 100,000,000 cu. ft. per annum to 223,000,000 cu. ft.

The second World War brought about a rapid increase in gas consumption and new carburetted water gas plants were installed in 1943 and 1947 by which time the annual make of gas had increased to 406,000,000 cu. ft. Requests were also being received for bulk supplies of gas to the neighbouring Undertakings of Rhos, Cefn Mawr and Llangollen.

By reason of the state of the manufacturing plant, now forty years old, and of the continuing increasing demand for gas supplies, it became obvious that new plant was urgently required and permission was sought by the Company,

and obtained from the Ministry of Fuel and Power, for the construction of a modern Intermittent Vertical Chamber Oven Plant of 25 Chambers, with a capacity of 2,250,000 cu. ft. per day, on a site adjacent to the existing works. This plant was to be so arranged that a duplicate setting could be later added to give a total output of 4,500,000 cu.ft. per day. With the existing water gas plants a total maximum daily output from the present site of 6,000,000 cu. ft. was to have been possible.

This then was the position on 1st May, 1949, when the Wrexham Gas Company became vested in the Wales Gas Board under the Gas Act, 1948.



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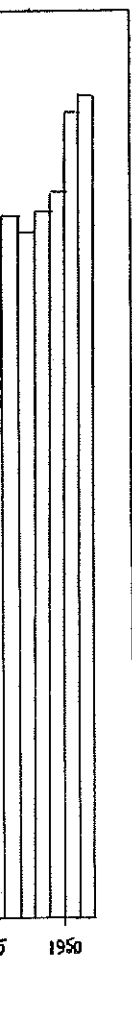
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000 cu. ft.

Wrexham Gas
Act, 1948.



It was now possible to review the gas supplies in the North Wales Area with a wider outlook, and as a result it was decided to choose a new site for the erection of the carbonising plant and to expand the proposals of the former Company to include the provision of the necessary purification, compressing, storage, steam raising, electricity generation and other ancillary plant on a new works which should not only supply gas southwards in the Rhos—Cefn Mawr—Llangollen area but also northwards to Mold, Buckley and Deeside.

In the Autumn of 1949 the Wales Gas Board acquired a site of 27 acres on the Wrexham Trading Estate some $3\frac{1}{2}$ miles south-east of the centre of the town for the purpose of erecting the Maelor Works.

NORTH WALES GAS GRID

THE new gasworks at Maelor is an important part of the co-ordinated scheme that has been prepared for the integration of gas supplies in the North Wales area.

Initially the gas produced at Maelor will supply the needs of consumers in the Wrexham, Rhos, Cefn Mawr and Llangollen areas. The construction of mains for Rhos and Cefn Mawr has been completed, and the mains to Llangollen are well advanced.

When the main north from Wrexham—which is in process of being laid—is ready, gas from Maelor will meet part of the requirements of the consumers at Mold, Buckley and Deeside.

Reference to the drawing on page 10 will indicate the extent of the gas grid planned up to the present time : local sections of this grid have already been laid. It will be seen that the grid planned will be supplied with gas from three principal sources of supply, viz. Maelor Works, coke oven gas from the Shotton Works of Messrs. John Summers and Sons, Ltd., and Methane (or 'firedamp') drained from Point of Ayr Colliery and subsequently treated to render it suitable as Town's gas. The latter project is the first large scale development of a process new to Great Britain, and the use of Methane from Point of Ayr will save the Nation some 30,000 tons of coal annually. This large scale commercial experiment will assist in determining the extent of similar development elsewhere.

The planned grid system, extending through the Counties of Denbighshire, Flintshire and Caernarvonshire, and into Anglesey, will serve not only the

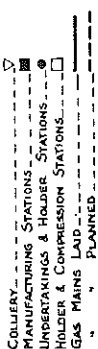
important developing industrial districts of Wrexham and Deeside, but also the North Wales coastal resorts as far as Caernarvon, with supplies to other communities. The system is designed so that further development can later proceed.

STATISTICAL INFORMATION

It is estimated that the Maelor Works will carbonise some 36,000 tons of coal per annum, producing 2,900,000 therms of gas, 18,000 tons of coke and 435,000 gallons of tar.

The area of supply of the Wrexham Undertaking alone covers approximately 38 square miles, some 80 miles of main being laid to serve 14,500 gas consumers. A further 8.5 miles of main have been laid to supply gas from Maelor to an additional 4,300 consumers in the areas served by the Rhos and Cefn Mawr Undertakings.

Extension of mains to serve Llangollen and the Deeside area north of Wrexham will add another 12,000 consumers to the mains system supplied from Maelor.



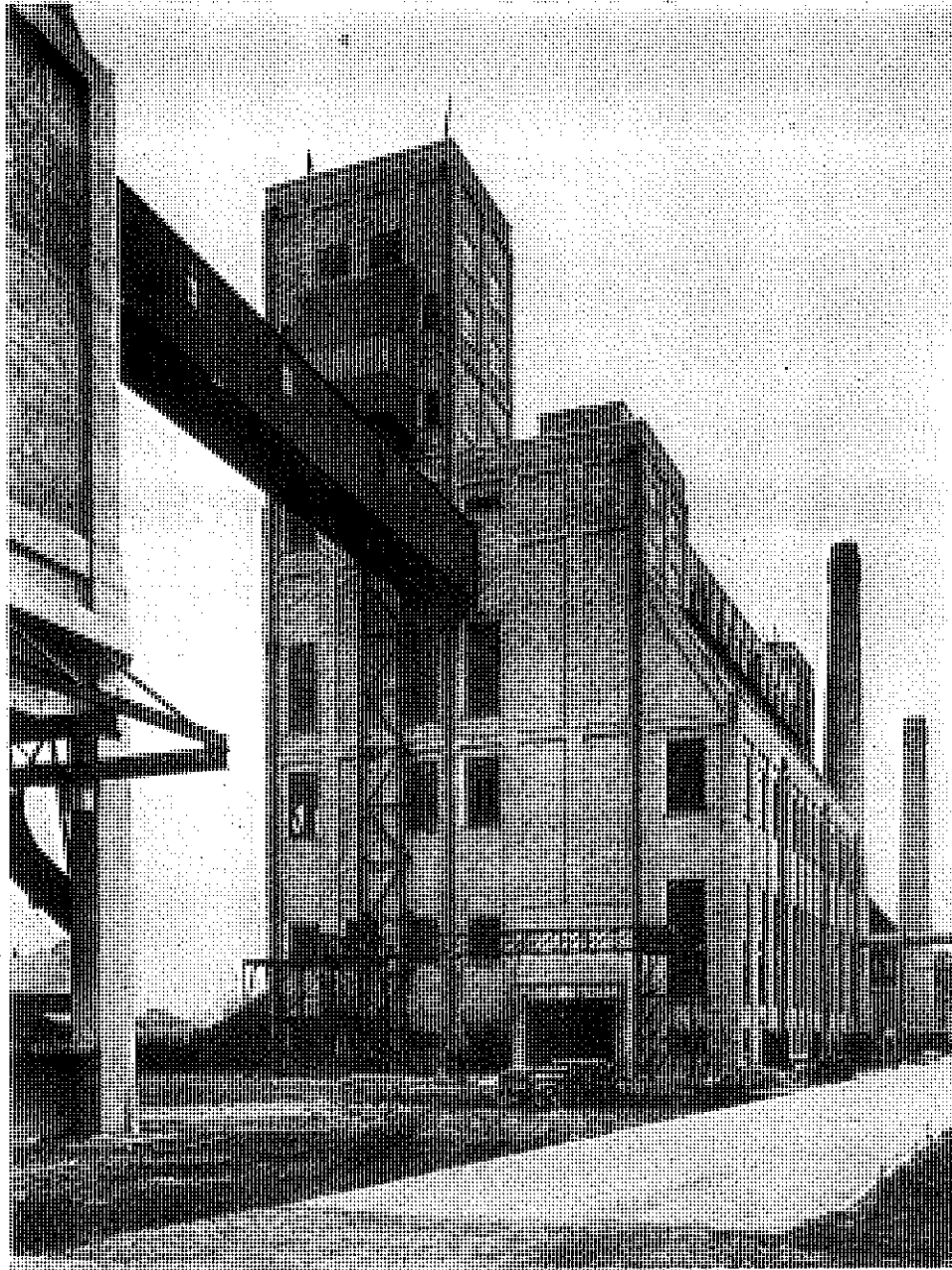


PLATE 1

General View of the Intermittent Vertical Chamber Oven Plant on the Coke Quenching and Handling Gable end; Belt Conveyor gantry and corner of R.C. coke screening and storage plant are shown.

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DESCRIPTION OF PLANT AND BUILDINGS

INTERMITTENT VERTICAL CHAMBER OVEN PLANT

THE Carbonising Plant is the fourth of its type to be installed in Wales, the others being Holywell (1933), Milford Haven (1936), and Abertillery (1937) ; selection of this type has been steadily growing in Great Britain over the last 20 years and particularly since the end of the World War II.

Intermittent Chambers are not limited to selected high grade coals but will deal adequately with a wide range, and particularly those of lower coking value, at the same time producing good yields of gas with a high degree of flexibility of output, and in particular a strong coke of low breeze content suitable for both domestic and industrial use.

The Carbonising Plant, complete with the necessary Coal and Coke handling equipment and Coke Grading, Storage and Loading plant has been designed and built by Messrs. W. J. Jenkins and Co., Ltd., of Retford, Notts.

The new installation consists of 25 chambers each of 3.65 tons capacity, arranged in one bench of five equal settings, and has a nominal maximum output of 2,250,000 cu. ft. per day. It is housed in a modern steel-frame brick-embellished building of pleasing architectural appearance and is designed for extension to double the present size in one or more stages. (See Plate 1).

COAL HANDLING PLANT

Coal brought to the site by road vehicles is discharged into an underground Receiving Hopper, from which it is extracted by means of a Feeder Conveyor of the De Brouwer type, either into a Coal Crusher or, in the case of small coal, into a by-pass chute, both of which discharge into a 40-ton per hour Elevator. From the Elevator the coal is discharged on to the first of two rubber belt conveyors, the second one running the full length of the overhead bunkers from which it is discharged by a travelling throw-off carriage. (See Plate 2). The overhead bunkers have a total storage capacity to cover 72 hours working and are completely enclosed to minimise dust nuisance and fire. Feeding doors in the bunker cover platforms are automatically opened and closed by a plough on the travelling throw-off carriage. Integral with these bunkers and extending

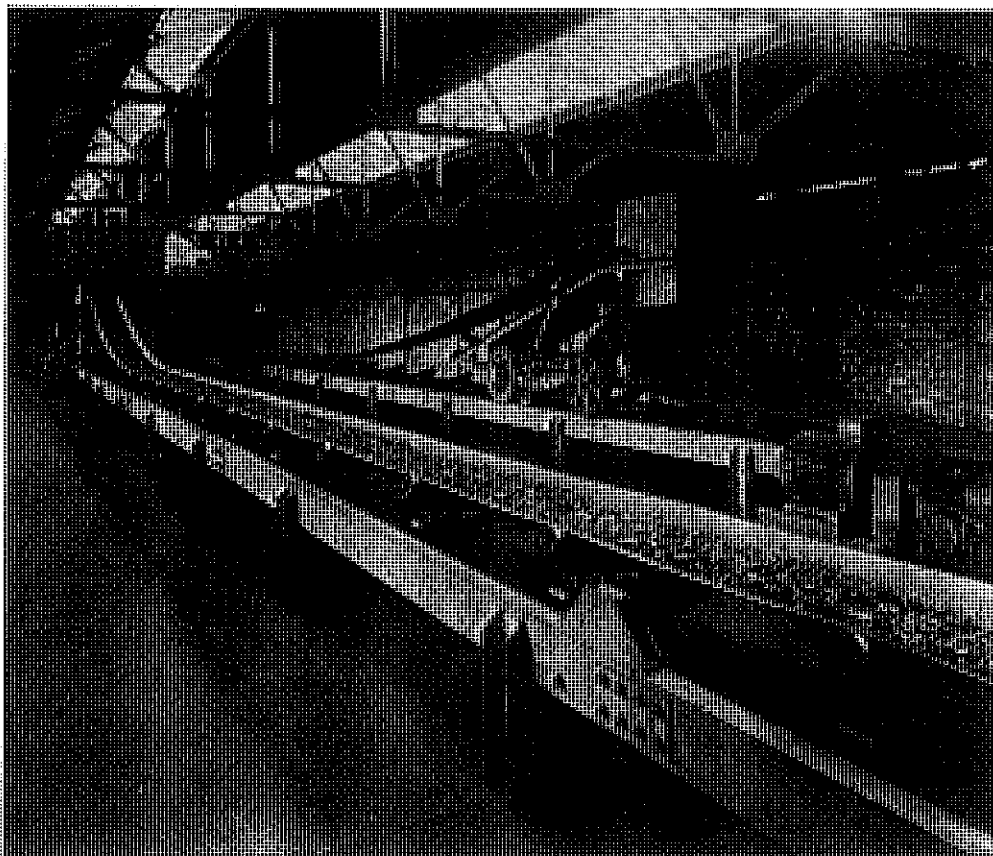


PLATE 2

Distributing Conveyors for Coal (foreground) and Coke (background), showing travelling throw-off carriages and the design of bunker top platform with plough operated filling doors.

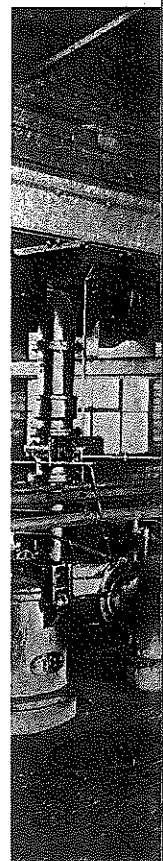
the full length of the bench are Coke Hoppers, also 72 hours storage capacity, for Producer fuel. The bunkers feed fuel through a series of outlets into a charging car which carries a measured quantity of coal for the charging of each chamber. This charging car is electrically propelled on an overhead track and is of special design to ensure uniform filling of each chamber to a predetermined height. A compartment of the car contains small coke which is fed to each chamber to protect the bottom door ; interlocked levers ensure that this breeze feed is dropped in before the coal charge. (See Plate 3).

Provision has been made for the installation of a duplicate Coal Elevator ; either Elevator will feed the present bench or the future extension.

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BENCH AND BRICKWORK

The bench is made up of 5 equal settings each of 5 chambers ; each setting is heated by a built-in step grate producer and has its own secondary air recuperator. The whole is rigidly braced by massive vertical side and end buckstays with horizontal members, and longitudinal and transverse tierods which are spring loaded to control expansion.

The chambers are constructed of 95% silica and measure approximately 19 ft. 2 in. high by 9 ft. 10 in. wide and are tapered 10 $\frac{1}{4}$ "—13" on the minor axis. The chamber heating flues are formed by continuous tongued and grooved key tiles bonding adjacent chambers throughout the full width, thus forming an entirely monolithic structure which gives maximum strength in the oven walls

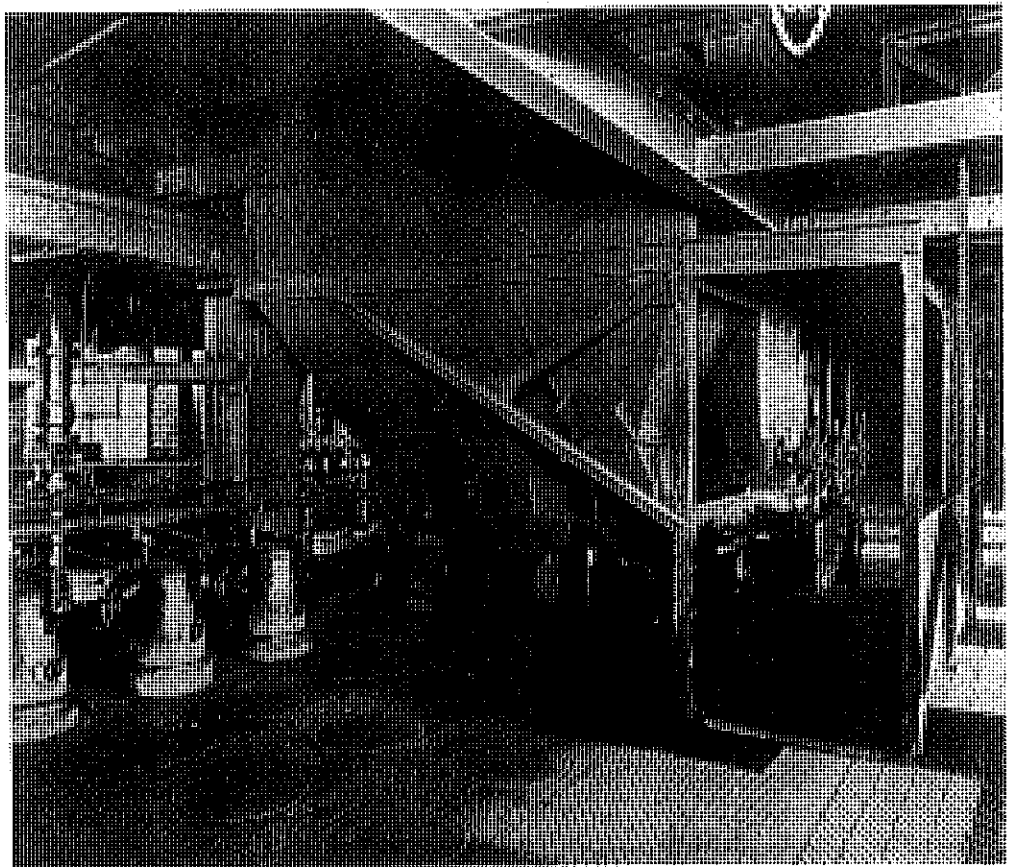


PLATE 3

Top of bench showing chamber charging car.

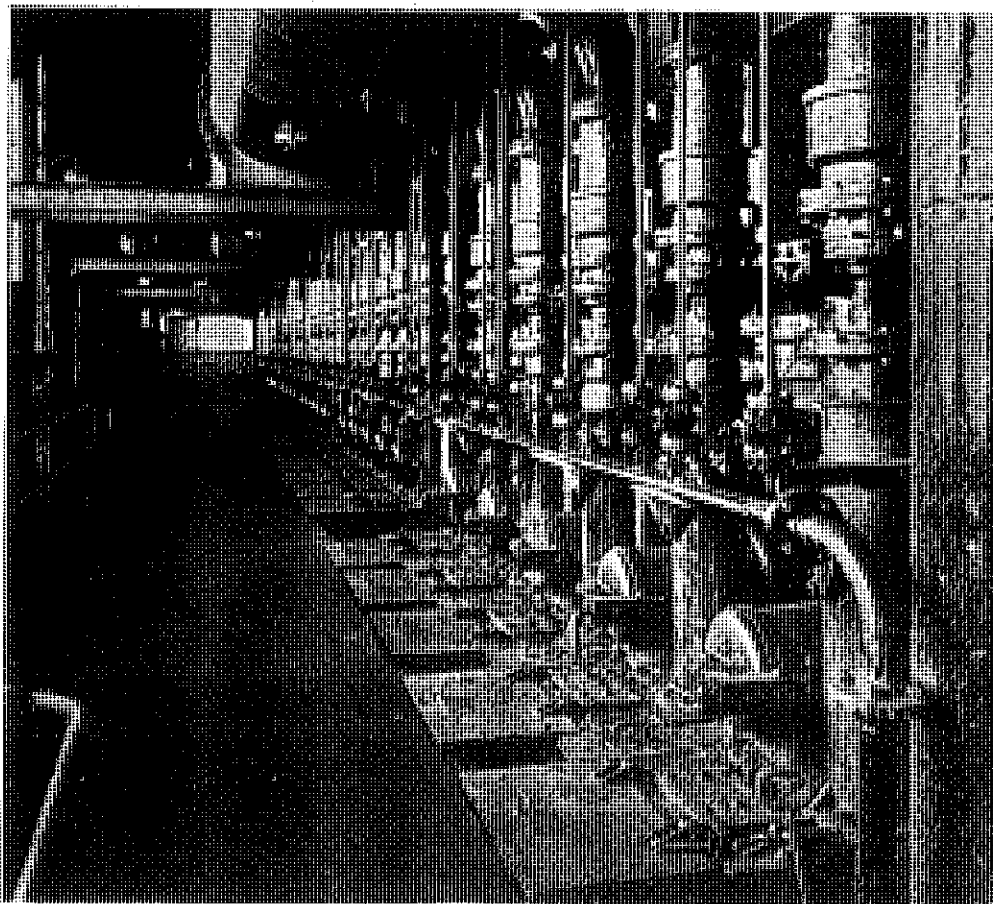


PLATE 4

Top Mains platform showing individual hydraulic mains.

to withstand the pressures exerted by strongly swelling coals. Expansion of the silica materials is provided for on the periphery of the silica work and this avoids the possibility of distortion thereby ensuring a long working life. The producer fittings are of the loose type to allow for expansion and to permit easy renewal. The recuperators are of the contra-flow type and a feature of this design, which gives absolute and easy control of temperature, is that each secondary air flue is entirely independent from the inlet slide to the combustion chamber. The settings are adequately insulated on bench top and side walls

GAS OFFTAKES AND DISCHARGE DOORS

Gas is taken away from the chambers by offtakes fitted at both top and bottom. Each top offtake feeds an individual hydraulic main from which the

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gas passes into a common collecting main (See Plate 4). The bottom gas offtake is of patented type and is actually formed in the dome of the bottom discharge doors. Along the length of the dome, which is virtually a semi-circular section pipe, there are a number of slots through which the gas flows to the collecting mains. (See Plate 5). Pressure in the lower part of the chamber is eliminated, thus permitting the use of water-sealed bottom doors. Counter balanced hand-operated closing gear is fitted to the bottom doors.

The gas offtakes, hydraulic mains, valves and collecting mains are continuously sprayed with hot ammoniacal liquor. Liquor is circulated by one of two pumps, one centrifugal type electrically driven, the other a reciprocating type steam driven which acts as a standby.

COKE QUENCHING AND HANDLING

At the conclusion of the carbonising period, coke is discharged from the chambers by manual opening of the bottom doors into a flat bottomed hot coke wagon which is traversed under the bench to the quenching tower by means of push button operated electrically-driven haulage gear. After quenching by a predetermined quantity of water, the wagon is removed from the quenching chamber and the coke discharged by hydraulically tipping the pivotted body of the wagon into a Receiving Hopper, from which it is extracted by means of a De Brouwer Conveyor, on which additional quenching can be carried out. This Conveyor discharges into a second hopper which feeds an electrically driven automatic Skip Hoist elevating the coke to a hopper in the Chamber House. From this hopper a reciprocating feeder delivers the coke onto a high speed vibratory screen where all material below $\frac{1}{2}$ " is removed, this being directed into a compartment of the overhead bunkers for use as the protecting pad for the bottom doors of the chambers before coal is charged into them.

The coke passing over the screen can then be either taken to the distributing conveyor over the bunkers in the Chamber House, for producer fuel, shown in Plate 2, or directly to the coke grading and storage plant.

COKE GRADING AND STORAGE PLANT

A Belt Conveyor from the Chamber House conveys this coke to a reinforced concrete building composed of screen house and bunkers of 350 tons capacity. On reaching the screening house, the coke first passes over a scalping screen which removes the fraction over 3" which flows via a spiral anti-breakage chute directly into the large coke compartment.

The coke below 3" passes on to a main grading screen of the balanced reciprocating type, which grades into four sizes :—0— $\frac{1}{2}$ ", $\frac{1}{2}$ —1 $\frac{1}{4}$ ", 1 $\frac{1}{4}$ "—2", 2"—3", spiral anti-breakage chutes again being employed for the two larger sizes of coke.

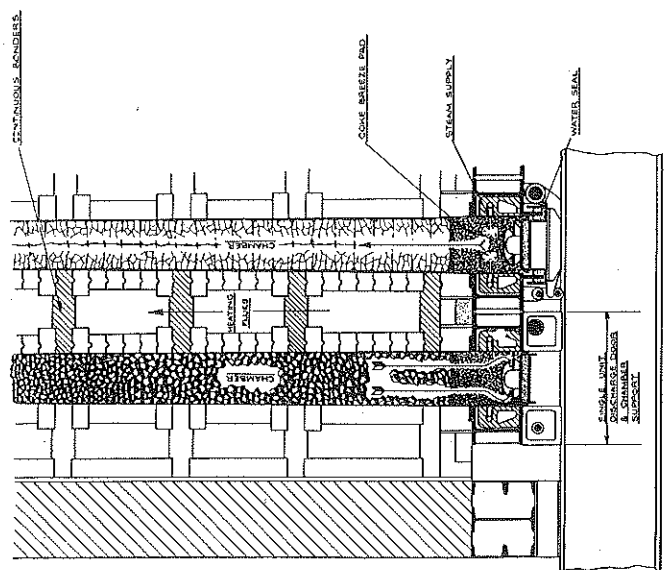
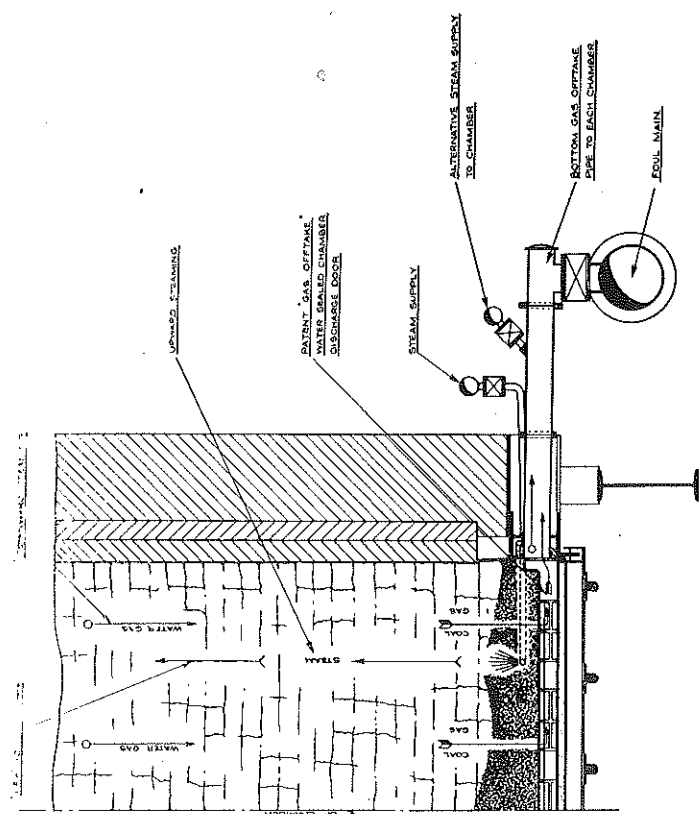


PLATE 5
Sections shewing combined chamber discharge door and support, one piece all welded steel design (water seal).

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The cones of the bunker are lined with special hard burnt tiles and are fitted with discharge doors below which are vibratory screens and loading chutes. All sizes of coke (except breeze) are re-screened to remove breeze and smalls, before being loaded to road or rail vehicles or into bags.

WASTE HEAT RECOVERY

The bench is equipped with a Spencer Bonecourt Waste Heat Boiler generating steam at a pressure of 150 lbs. per sq. in., the boiler being complete with electrically driven draught fan, feed pump and automatic boiler feed controls. This Boiler deals with the full output of waste gas from the bench ; a brick chimney deals with the waste gas during the boiler overhaul but provision has been made for the later addition of two more boilers.

GENERAL

The whole plant has been designed to ensure economical working as regards fuel and power and labour requirements and is very fully instrumented for ease of control.

Much thought has been given to the ease of operation and comfort of the stokers ; adequate natural and artificial lighting is ensured with roomy platforms and staircases and a goods/passenger lift gives access to all levels. Mess, locker and bathing and lavatory accommodation have all been provided in the building.

BUILDINGS

When the site was taken over it held several buildings that had been erected during the War while the site was part of the Ordnance Factory. These are mostly in fair condition and a serious endeavour was made to use some or all of them for works' purposes. They had been erected for a special purpose and it was found that, except as stores and one building to be made into a repair shop, they were unsuitable for gas works' purposes.

Four of these buildings have had to be removed.

Four new buildings have been erected ; the Retort House which has already been described, the Carburetted Water Gas House, Compressor and Power House, and the block containing the laboratory and offices, which are all described in later sections.

ROADWAYS AND YARDS

The site has a clay subsoil and in wet weather is impassable to vehicles.

The whole of roadways and yards where vehicular traffic is expected have been covered with an 8" layer of reinforced concrete, carefully laid and drained.

CARBURETTED WATER GAS HOUSE

This is a sheeted building of brick and steel frame construction and is so designed that protection is given to overhead bunkers for water gas plant and boiler fuel within the building.

The building houses two solid fuel boilers and is intended to accommodate Two-750,000 cu. ft. per day capacity carburetted water gas sets that are to be transferred to Maelor from the existing Rivulet Road Works in Wrexham.

A separate blower room for the water gas plant is provided in the building.

The building is designed to hold a third boiler and Two-1,750,000 cu. ft. per day capacity carburetted water gas sets (in place of the present 750,000 cu. ft. sets), and for extension if required.

SOLID FUEL BOILERS

The boiler installation in the carburetted water gas house consists of 2 Economic Boilers, 16' long $\times$ 10' 6" dia., fitted with Oldbury Chain Grate Stokers for firing Coke Breeze. Automatic control of feed water level is provided, together with comprehensive panel of recording instruments. The boilers are fitted with forced draught and induced draught fans, grit arresters and superheaters. Each boiler is rated at 6,000 lbs. of steam per hour when firing Coke Breeze. Steam is generated at 150 lbs. per sq. in. and superheated, as in the case of the Retort House waste heat boiler.

COMPRESSOR AND POWER HOUSE

This new brick building of modern design houses gas exhausting and compressing plant and a bulk supply gas meter in one section, and in an entirely separate section electricity generating plant, switchboard and high tension equipment for the electro-detarrer.

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EXHAUSTERS AND COMPRESSORS

Two steam driven Rootes type exhausters, each of 200,000 cu. ft. per hour capacity, are installed for handling coal gas or carburetted water gas, or a mixture of these gases.

Overhead gas connections are so arranged that the present units can be replaced by larger machines at some future date if required.

COMPRESSORS

The compressor installation consists of two steam-driven Rootes type compressors, capable of handling 120,000 cu. ft. of gas per hour against 7 lbs./p.s.i. pressure, for supplying gas to the Wrexham district and into the grid main supplying gas to Rhos, Cefn Mawr and Llangollen.

One steam-driven vertical reciprocating compressor, capable of handling 70,000 cu. ft. of gas per hour against 15 lbs. p.s.i. pressure, is also provided for supplying gas north to the Deeside Undertakings.

A Connersville meter with a rating of 150,000 cu. ft. per hour, is installed for metering under pressure the gas supplied into the grid main running north from Wrexham.

There is room in this section of the compressor and power house for the installation of two more exhausters and an additional compressor, at some future date.

ELECTRICITY GENERATING PLANT

Two 250 kilowatt alternator sets, driven by 365 B.H.P. compound condensing steam engine are provided.

A small diesel engine-driven alternator set is provided for emergency use.

A 10-ton overhead travelling crane is installed.

LABORATORY AND OFFICE BLOCK

This is a flat-roofed brick building, adjacent to the purification plant, which will contain Laboratories, Fairweather Calorimeter Room and offices for Works' Management and Technical Staff.

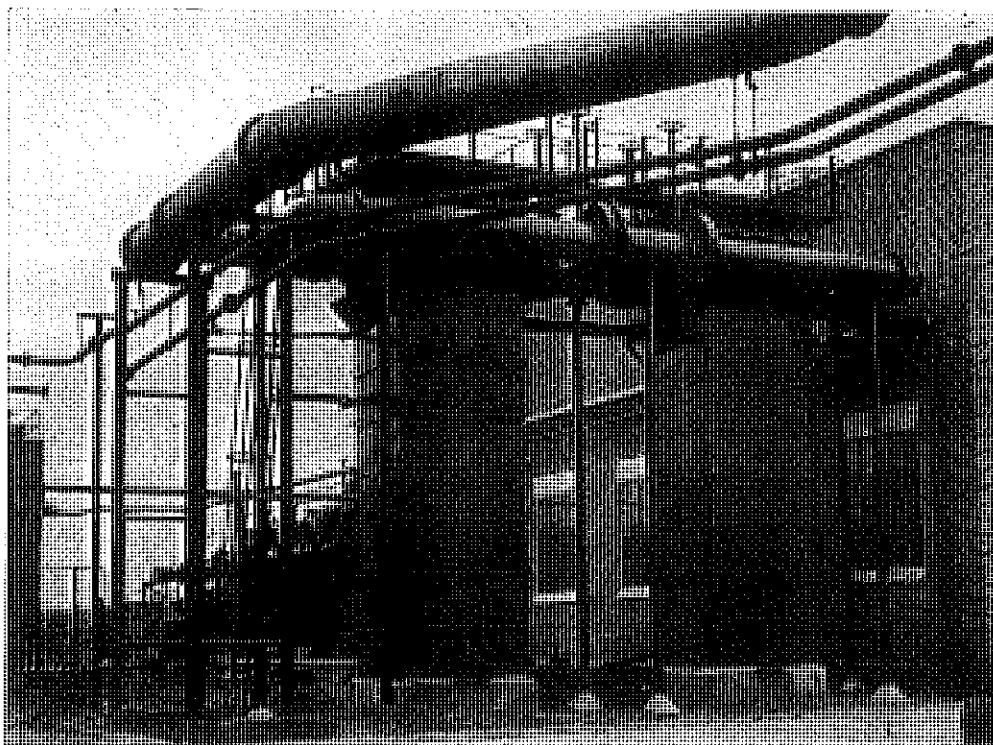


PLATE 6 — CONDENSERS

ANCILLARY PLANT

CONDENSERS

Two vertical water-cooled condensers, of 5,000,000 cu. ft. per day capacity, are provided. (See Plate 6).

Each condenser consists of a mild steel vertical chamber measuring $6' 7\frac{1}{2}"$ x $5' 6\frac{3}{4}"$ x $25' 6"$ high with vertical water tubes and 24" dia. gas connections.

Automatic control of the outlet gas temperature is provided by means of thermostatically-operated cooling water supply valve.

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DETARRER

The detarrer is installed in the gas stream at outlet of exhausters and is designed to handle 5,000,000 cu. ft. of gas per day with 99% efficiency of removal of tar fog. (See Plate 7).

The detarrer consists of a mild steel circular vessel, 6' dia. x 26' high and is fitted with 24" gas connections.

The electrical equipment is fitted with safety interlocking gear and consists of transformer, rectifier and control panel situated in the power house.

AMMONIA WASHER

The ammonia washer consists of a static type washer in two sections, of all steel construction, with 24" valves and connections, designed for a capacity of 5,000,000 cu. ft. per day. Each section measures 10' 8" x 5' 4" x 13' 1" high and contains 4 washing bays packed with board filling.

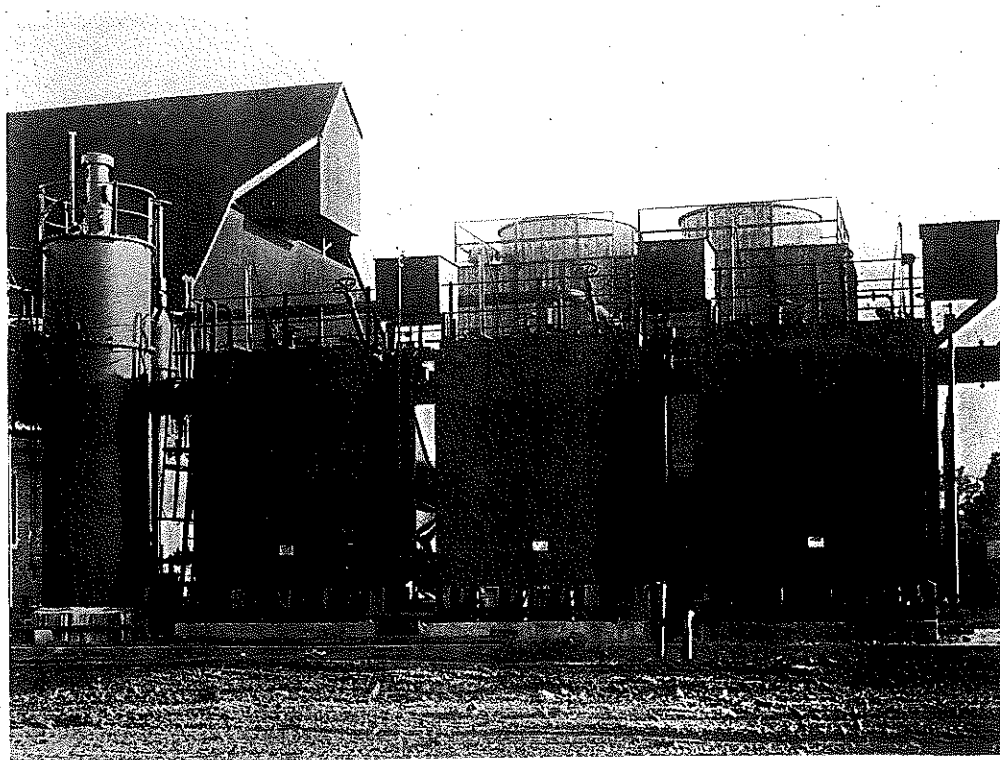


PLATE 7—DETARRER AND STATIC WASHERS

Individual liquor circulating pumps are provided for each bay, there being a separate electric motor and counter-shaft for each section.

NAPHTHALENE WASHER

This consists of a single mild steel rectangular vessel, board filled, with 4 bays, overall dimensions being 10' 8" x 5' 4" x 13' 1" high, designed for a capacity of 5,000,000 cu. ft. per day. Valves and connections of 24" dia. are provided with electric motor and circulating pumps as for the Ammonia washers.

This washer stands in line with and is of similar design to the ammonia washers.

PURIFIERS

Five reinforced concrete ground level purifiers are installed with suitably braced steel lids, each box measuring 35' x 35' x 6' deep. There are two lids to each box and the purifying material is carried on two layers of grids.

The five boxes are arranged for series rotation through 20" dia. valves and connections, with split flow to each box. A gas heater is provided on the main inlet to the purifiers.

A travelling gantry is provided for lifting the lids when the purifiers are to be emptied and filled.

Oxide handling will be by means of a 24 R.B. Diesel-driven crane with special bucket.

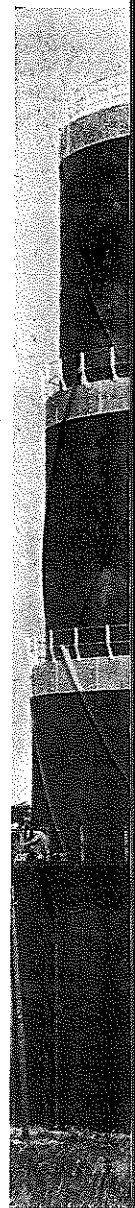
STATION METER

A Connersville Station Meter with a rated capacity of 200,000 cu. ft. per hour is provided on inlet holder, with valves and connections of 20" dia.

TOWN'S GASHOLDER

The main gasholder has three spirally guided lifts in a steel tank and when fully inflated has a capacity of 500,000 cu. ft. It is equipped with 30" dia. valves and connections and is of rivetted construction. (See Plate 8).

Anti-flood pipes are provided on the inlet and outlet mains, as well as a safety by-pass governor between inlet and outlet.



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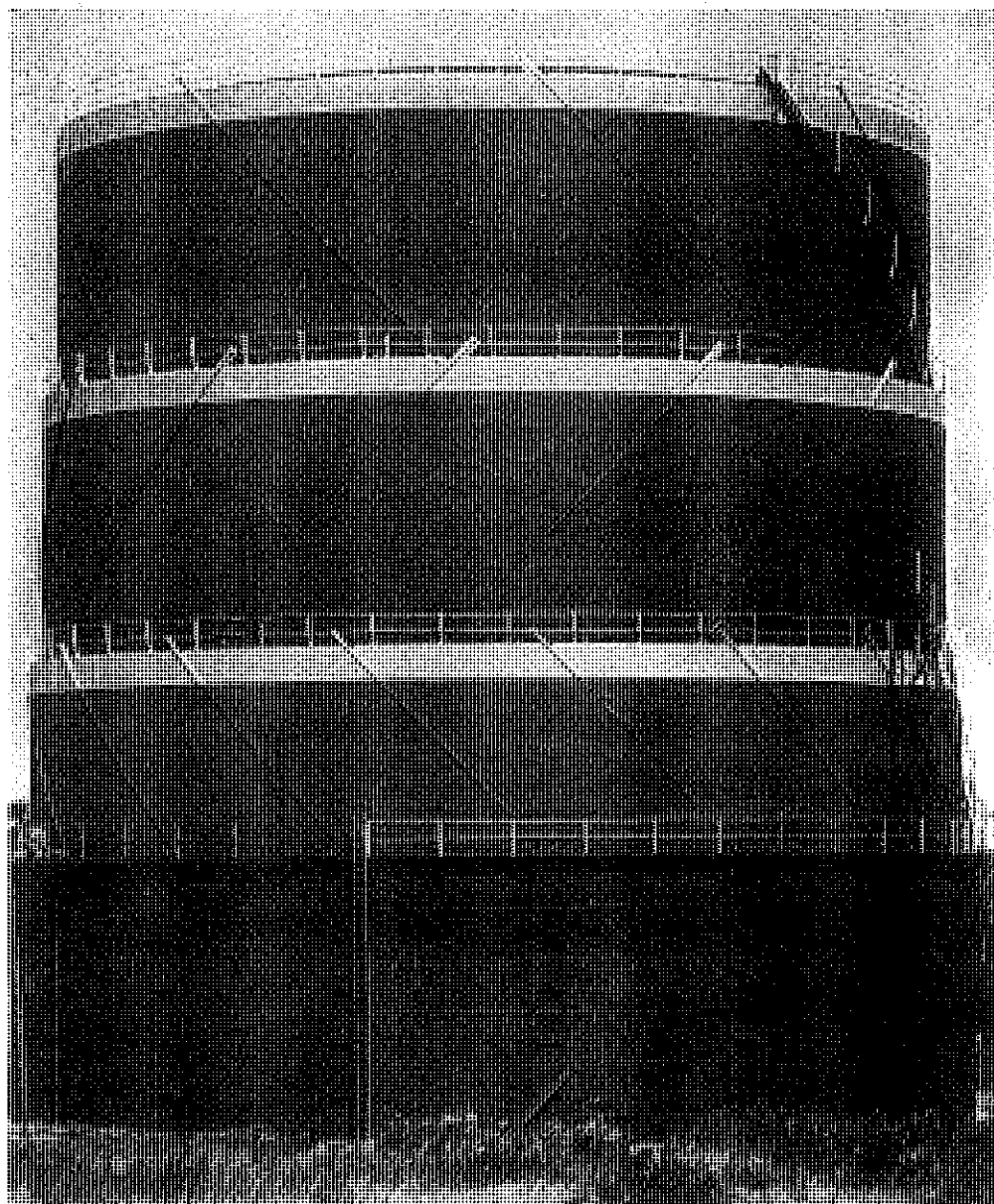


PLATE 8 — 500,000 CU. FT. GASHOLDER

The practice of using hot enamel for protecting parts of the holder exceptionally liable to corrosion, as adopted at Pontypool has been repeated in the case of this holder.

The principal dimensions of the holder are :—

Inner Lift	88' 2" dia.	x 27' 9" deep.
Middle Lift	90' 10" „	x 27' 9" „
Outer Lift	93' 6" „	x 27' 9" „
Steel Tank	96' 0" „	x 28' 6" „

The pressure thrown by the holder is 13.4" when fully inflated.

CARBURETTED WATER GAS RELIEF HOLDER

A two-lift spirally guided holder in steel tank, of all welded construction, with a capacity of 250,000 cu. ft. is provided for storage of carburetted water gas prior to its being mixed with the coal gas stream.

The following are the principal dimensions :—

Inner Lift	77' 0" dia.	x 27' 3" deep.
Outer Lift	79' 8" „	x 27' 3" „
Steel Tank	81' 11" „	x 27' 9" „

GAS DEHYDRATION PLANT

A calcium chloride gas-drying plant is provided on outlet holder, having a capacity of 5,000,000 cu. ft. per day. Valves and connections are 24" dia. The plant consists of a cast iron static washer of 4 chambers, brush-filled, dimensions 4' 6" x 10' x 15' high. The plant is provided with rack cooler, pumps, storage tanks and concentrator for calcium chloride.

WATER COOLING TOWER

An induced draught water cooling tower, capable of dealing with 45,000 gallons of water per hour, is installed to allow for re-circulation of condenser cooling water. The tower is of rectangular timber construction, with board filling, and stands over a reinforced concrete water basin which forms its foundation.

Two electrically-driven centrifugal water circulating pumps with 9" water connections are provided.

LIQUOR CONCENTRATION PLANT

A liquor concentration plant for the automatic production of concentrated liquor of 20% ammonia content, and capable of dealing with 20,000 gallons per hour of crude liquor, is provided.

A cylindrical storage tank of 11,000 gallons capacity is provided for storing the concentrated liquor.

TAR AND LIQUOR STORAGE

Underground storage for the tar, crude liquor and the effluent from the concentrated liquor plant, is provided by an underground reinforced concrete tank, having a total capacity of 280,000 gallons.

A mass concrete foundation forms the bottom of the tank and the tank is covered by a reinforced concrete roof which carries the detarrer and static washers for removal of ammonia and naphthalene.

Tar and liquor pumps and necessary connections are also carried on the tank top.

Incoming tar and liquor passes through an underground separating tank, capacity 6,000 galls., adjacent to the main storage tank.

WEIGHBRIDGE

A 30-ton platform road vehicle weighbridge is provided at the entrance to the works.

STEAM AND POWER

Works' steam requirements will be met by recovery of heat from the flue gases leaving the retort bench by means of waste heat boiler in the Retort House.

This boiler has a rated capacity of 7,500 lbs. of steam per hour at 150 lbs. p.s.i., and superheated to 500°F.

An alternative and supplementary source of steam supply will be provided by two Economic Boilers in the water gas plant house which are equipped with chain grate mechanical stokers for Breeze firing.

These boilers are each rated at 6,000 lbs. of steam per hour when firing Breeze, also at 150 lbs. p.s.i. and 500°F. superheat.

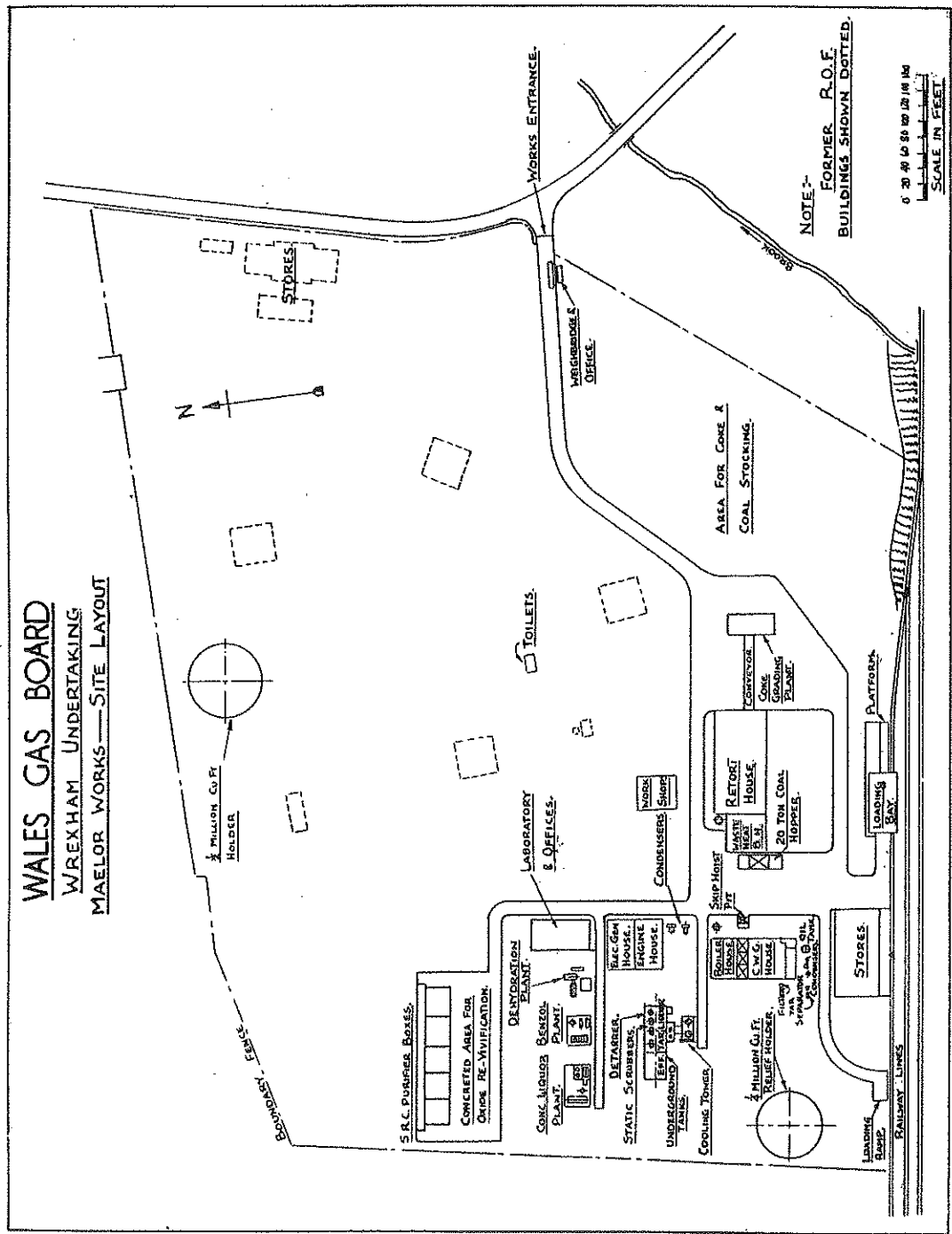
Steam used for driving exhausters, compressors and boiler feed pumps is exhausted at 30 lbs. p.s.i. to provide a supply of low pressure steam for process work.

Electricity is generated by alternators driven by compound steam engines which are condensing.

All other machinery on the works is electrically driven.

WALES GAS BOARD
WREXHAM UNDERTAKING
MAELOR WORKS — SITE LAYOUT

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LIST OF MAIN CONTRACTORS

Intermittent Vertical Chamber	
Oven Plant . . .	W. J. JENKINS & CO., LTD.
Coke Grading Plant . . .	W. J. JENKINS & CO., LTD.
Condensers . . .	WHESOE, LTD.
Detarrer . . .	WHESOE, LTD.
Ammonia Washer . . .	WHESOE, LTD.
Naphthalene Washer . . .	WHESOE, LTD.
Purifiers . . .	PETER LIND & CO., LTD.
Station Meter . . .	W. C. HOLMES & CO., LTD.
Gas Dehydration Plant . . .	W. C. HOLMES & CO., LTD.
Concentrated Liquor Plant . . .	W. C. HOLMES & CO., LTD.
Gas Holders . . .	DRUMMOND & CO. WHESOE, LTD.
Economic Boilers . . .	FOSTER, YATE & THOM, LTD. EDWIN DANKS & CO., LTD. (Chain Grate Stokers). UNIT SUPERHEATER & PIPE CO., LTD. (Superheaters). CLYDE BLOWERS, LTD. (Soot Blowing Equipment). DAVIDSON & Co., LTD. (Induced Draught Fans and Grit Arresters). G. & J. WEIR, LTD. (Feed Pumps).
Carburetted Water Gas House	T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork). HUMPHREYS & GLASGOW, LTD. (Skip Hoist and Coke Chutes). T. E. WARRINGTON, LTD. (Chimney).
Compressor and Power House .	T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork).
Exhausters and Compressors .	GEO. WALLER & SON. BRYAN DONKIN CO., LTD.
Steam Engines . . .	BELLISS & MORCOM, LTD.
Alternator Sets . . .	BELLISS & MORCOM, LTD.
Electrical switchgear and cables	THORNTONS, WREXHAM.
Steam Pipe Lines . . .	UNIT SUPERHEATER & PIPE CO., LTD. VERSIL LTD. (Insulation).
Gas Mains . . .	STEWARTS & LLOYDS, LTD.
Gas Valves . . .	WESTWOOD & WRIGHTS, LTD.
Site Preparation, Roads, Fencing and Drainage . . .	WHITLEY BROS.
Foundations . . .	W. J. JENKINS & CO., LTD. (F.C. Construction Co.) PETER LIND & CO., LTD. A. MONK & CO., LTD.

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Bricks	.	.	.	LONDON BRICK COMPANY, LTD.
Cement	.	.	.	TUNNEL PORTLAND CEMENT CO.
Roof Sheetting	.	.	.	ROBERTSON THAIN, LTD.
Consultants	.	.	.	SOIL MECHANICS, LTD.
				SCOTT & WILSON.
				VULCAN BOILER & GENERAL INSURANCE CO., LTD.
				BRITISH ENGINE BOILER & ELECTRICAL INSURANCE, CO.,
				LTD.
Architects	.	.	.	W. J. JENKINS, LTD.
				E. COLWYN FOULKES, Colwyn Bay.

A large amount of work has been carried out by the Board's own staff. This includes pipe fitting and plumbing work on gas, water and liquor services and other general pipework, together with painting and final preparation of the site and plant for full operation.



WorleyParsons

resources & energy

EcoNomics

**NATIONAL GRID PROPERTY HOLDINGS LTD
ENVIRONMENTAL ASSESSMENT SITE INVESTIGATION REPORT
MAELOR WORKS, WREXHAM**

Appendix III Summary of Gasworks Contaminants



**NATIONAL GRID PROPERTY HOLDINGS LTD
ENVIRONMENTAL ASSESSMENT SITE INVESTIGATION REPORT
MAELOR WORKS, WREXHAM**

SUMMARY OF GASWORKS CONTAMINANTS

The following section briefly describes some of the contaminants that may have been disposed of at the site, given its proximity to former gasworks.

Coal Tar and related wastes

Coal tar may be liquid to semi-solid. In weathered coal tars, the main component is likely to be polycyclic aromatic hydrocarbons (PAH). PAHs have a low leaching potential, are relatively non-volatile, and have the potential to bio accumulate. The solubility of PAHs can, however, be increased due to the presence of lighter hydrocarbons such as benzene, toluene, ethyl benzene and xylene (the BTEX compounds) as found in diesel and petrol. As the PAHs weather over time, the lower molecular weight compounds will volatilise and desorb.

The phenols in ammoniacal liquor are very soluble in water, show little retardation, and have a low potential for bioaccumulation. Their volatility is very low, except in surface waters where photochemical reactions will cause rapid volatilisation. Therefore, they are highly mobile in groundwater, but not in surface water. Low concentrations of phenols (~ 5µg/l) can cause tainting of water supplies.

Foul Lime Waste

The waste is a hydrogen-rich, sulphurous solid, which readily weathers to a rock-like appearance. Hydrogen sulphide, the main toxic component, is flammable and is formed when foul lime is exposed to air. When foul lime is weathered in the subsoil, it is converted to calcium sulphate, which has limited solubility compared to other sulphates.

Spent Oxide Waste

Spent oxide is generally composed of between 30 and 50% sulphur, small percentages of complex cyanides and traces of 'easily liberatable' or free cyanide. The mobility of cyanides depends on their speciation and soil pH. Complex cyanides are the most common, these typically being ferric or ferro cyanide. The behaviour of these cyanide salts is determined more by the pH of the soil than by their concentration. High pHs can mobilise complex cyanides. The toxicity of complex cyanide is low.

Easily liberatable or free cyanides are much more toxic (approximately 100 times that of phenols and PAHs), but are typically found at low concentrations. Free cyanide is formed from the dissociation of complex cyanides when heated or exposed to sunlight. Free cyanides are not often found in groundwater as they quickly degrade microbially and, under acidic conditions, through the formation of hydrogen cyanide gas. If free cyanide occurs in soils, soil microbes into carbon dioxide and ammonia can quickly break it down. In surface soils, it is readily oxidised to cyanate.



**NATIONAL GRID PROPERTY HOLDINGS LTD
ENVIRONMENTAL ASSESSMENT SITE INVESTIGATION REPORT
MAELOR WORKS, WREXHAM**

Complex cyanides are stable under acidic conditions but free cyanides are water-soluble. Thiocyanate and ferri- and ferrocyanide are moderately soluble and therefore may contribute to water contamination (DOE, 1996).

Metals

In general, the behaviour of metals is determined by chemical reactivity, chemical stability, water solubility, pH and the cation exchange capacity of the receiving media. Metals released from on-site processes will have varying degrees of solubility depending on the nature of the associated anion. Often, the sulphides and oxides are of low solubility and a sharp decrease in concentration with depth through the soil is expected.

The fate and transport of metal compounds through soil is complex, being dependent on physical, chemical, and biological factors. There tends to be a greater degree of contaminant adsorption in soils with a high organic and clay content; hence a lower potential for contaminant migration. The less soluble compounds, which adsorb to organic or clay soil, will slowly desorb in soil-water, providing a continuing source of water pollution.

The solubility of some metals (e.g. copper, zinc and lead) can increase under acidic soil conditions while arsenic may become more soluble under alkaline conditions.

Hydrocarbon Fuel Oils

Fuel oils and some coal tar compounds were sometimes added to coal prior to gasification in the gasworks retorts and in the purification processes. This technique reduced the quantity of coal used and increased the quantity of gas produced. Oil would have been stored on the gasworks sites and this constitutes a potential soil and groundwater contamination threat to the holder site. Hydrocarbon fuel oils are light non-aqueous phase liquids (LNAPLs) and will float on the groundwater surface, migrating long distances in both the dissolved and free phase.



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MAELOR WORKS, WREXHAM**

SUMMARY OF GASWORKS CONTAMINANTS

The following section briefly describes some of the contaminants that may have been disposed of at the site, given its proximity to former gasworks.

Coal Tar and related wastes

Coal tar may be liquid to semi-solid. In weathered coal tars, the main component is likely to be polycyclic aromatic hydrocarbons (PAH). PAHs have a low leaching potential, are relatively non-volatile, and have the potential to bio accumulate. The solubility of PAHs can, however, be increased due to the presence of lighter hydrocarbons such as benzene, toluene, ethyl benzene and xylene (the BTEX compounds) as found in diesel and petrol. As the PAHs weather over time, the lower molecular weight compounds will volatilise and desorb.

The phenols in ammoniacal liquor are very soluble in water, show little retardation, and have a low potential for bioaccumulation. Their volatility is very low, except in surface waters where photochemical reactions will cause rapid volatilisation. Therefore, they are highly mobile in groundwater, but not in surface water. Low concentrations of phenols (~ 5µg/l) can cause tainting of water supplies.

Foul Lime Waste

The waste is a hydrogen-rich, sulphurous solid, which readily weathers to a rock-like appearance. Hydrogen sulphide, the main toxic component, is flammable and is formed when foul lime is exposed to air. When foul lime is weathered in the subsoil, it is converted to calcium sulphate, which has limited solubility compared to other sulphates.

Spent Oxide Waste

Spent oxide is generally composed of between 30 and 50% sulphur, small percentages of complex cyanides and traces of 'easily liberatable' or free cyanide. The mobility of cyanides depends on their speciation and soil pH. Complex cyanides are the most common, these typically being ferric or ferro cyanide. The behaviour of these cyanide salts is determined more by the pH of the soil than by their concentration. High pHs can mobilise complex cyanides. The toxicity of complex cyanide is low.

Easily liberatable or free cyanides are much more toxic (approximately 100 times that of phenols and PAHs), but are typically found at low concentrations. Free cyanide is formed from the dissociation of complex cyanides when heated or exposed to sunlight. Free cyanides are not often found in groundwater as they quickly degrade microbially and, under acidic conditions, through the formation of hydrogen cyanide gas. If free cyanide occurs in soils, soil microbes into carbon dioxide and ammonia can quickly break it down. In surface soils, it is readily oxidised to cyanate.



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Complex cyanides are stable under acidic conditions but free cyanides are water-soluble. Thiocyanate and ferri- and ferrocyanide are moderately soluble and therefore may contribute to water contamination (DOE, 1996).

Metals

In general, the behaviour of metals is determined by chemical reactivity, chemical stability, water solubility, pH and the cation exchange capacity of the receiving media. Metals released from on-site processes will have varying degrees of solubility depending on the nature of the associated anion. Often, the sulphides and oxides are of low solubility and a sharp decrease in concentration with depth through the soil is expected.

The fate and transport of metal compounds through soil is complex, being dependent on physical, chemical, and biological factors. There tends to be a greater degree of contaminant adsorption in soils with a high organic and clay content; hence a lower potential for contaminant migration. The less soluble compounds, which adsorb to organic or clay soil, will slowly desorb in soil-water, providing a continuing source of water pollution.

The solubility of some metals (e.g. copper, zinc and lead) can increase under acidic soil conditions while arsenic may become more soluble under alkaline conditions.

Hydrocarbon Fuel Oils

Fuel oils and some coal tar compounds were sometimes added to coal prior to gasification in the gasworks retorts and in the purification processes. This technique reduced the quantity of coal used and increased the quantity of gas produced. Oil would have been stored on the gasworks sites and this constitutes a potential soil and groundwater contamination threat to the holder site. Hydrocarbon fuel oils are light non-aqueous phase liquids (LNAPLs) and will float on the groundwater surface, migrating long distances in both the dissolved and free phase.



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MAELOR WORKS, WREXHAM**

Appendix IV Site Investigation Health, Safety and Environmental Report



Maelor Works, Wrexham

SI Construction Phase HSSE Plan

50065-29

5 May 2011

APPROVED BY	NAME	SIGNED	DATE
Site Supervisor:	A Smith	<i>A. Smith</i>	10/05/11
Project Manager:	N Glynn	<i>N Glynn</i>	10/5/11
HSSE Advisor:	J Godwin	<i>J Godwin</i>	10/5/11

THIS DOCUMENT TO BE AVAILABLE ON SITE AT ALL TIMES

- Use the HSSE Plan checklist (overleaf) to confirm essential procedures have been completed prior to critical check points.
- The office diary must be filled in with site work details before the site visit is undertaken.
- A Daily Site Record Form must be completed for each operational day on site.
- The Post Job HSSE Report / Feedback Form must be filled in, copied to the HSSE Advisor at the end of the job and the content/operation of the Plan discussed.

Infrastructure & Environment

3 - 8 Redcliffe Parade West
Bristol BS1 6SP
United Kingdom
Telephone: +44 (0) 117 925 1304
Facsimile: +44 (0) 117 910 5139

worleyparsons.com

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EcoNomics



HSSE PLAN CHECKLIST		Complete for all items – use N/A if appropriate	
PROCEDURE	DATE	INITIAL	
Before leaving for site:			
1. Obtain up to date (< 3 months old) service plans and advise utility companies of site work			
2. Supply all subcontractors with adequate HSSE information for the job (e.g. a copy of the draft HSSE plan & other supporting information). No fixed blade knives!			
3. Review all subcontractor Risk Assessments and Method Statements (use Form)			
4. Identify hazardous activities where <i>Permits to Work</i> are required			
5. Complete the HSSE Plan, get it reviewed and submit to client for approval			
6. Check contents of HSSE site box (Red Box) are complete and in date			
7. Develop Constraints Drawing – issue to CDM coordinator and client			
8. Get Work Commencement Order			
CRITICAL CHECK POINT: All above items must be complete before going to site.			
Before starting work at the site:			
9. Assess ALL hazards on site and record on Site Hazard Analysis Form			
10. Check site security arrangements are as arranged and adequate			
11. Post ALL necessary documentation where it can be easily seen			
12. Check subcontractor competency documents and record details in HSSE Plan			
13. Check ALL PPE is in good condition and within expiry date			
14. Check subcontractor equipment documents and complete Form			
15. Check skips & drums for fitting lids / locking covers & no holes			
16. Carry out HSSE induction for all site staff and record on Sign-Off Sheet			
CRITICAL CHECK POINT: All above items must be complete before starting work on site.			
For each work day on site:			
17. Carry out a Toolbox Talk (before starting work). Fill in Form.			
18. Carry out an Emergency Drill (one per job, enter details in Daily Record Sheet)			
19. Complete a Daily Site Record Sheet with all relevant details			
20. Verbal update to Project Manager at end of work day			
21. Provide an update to the client each day unless otherwise instructed			
22. Ensure the site is left in a safe, tidy and secure condition			
23. Call the PM or other nominated person to confirm you have left site and returned home safely			
CRITICAL CHECK POINT: All above items must be complete before leaving the site.			
At the end of the job before closing the project:			
24. Complete a Waste Report as appropriate			
25. Update the service plan and supply copy to utility companies if changes			
26. HSSE Report Form to HSSE Advisor and discuss content (successes & problems)			
27. Submit a copy of the final updated HSSE Plan to the CDM Coordinator (H&S File)			
28. All WP staff to update personal Site Skills Matrix records			



SITE INDUCTION CHECKLIST

☒	Introductions (HSSE Plan, Site Supervisor, WP personnel, Drillers, JCB driver, NGG rep, etc)
☒	Identify First Aider on site. Ask: "Are there any health conditions we should know about?"
☒	Location of H&S Box and contents (First Aid kit, fire extinguisher, eye wash, COSHH sheets, respirator)
☒	Location of welfare facilities
☒	Location of obligatory posted documents
	SITE RULES
☒	Minimum PPE to be worn at all times correctly (hard hat, reinforced toecaps and sole boots, high-vis vest, gloves, eye protection, <u>flame retardant overalls</u> , as appropriate).
☒	Drillers PPE – Ear defenders, respirators if required (<i>fill out: Respirator Inspection Form</i>)
☒	Let Site Supervisor know if you leave site
☒	No smoking on site
☒	Avoid contact with contaminated material / surface
☒	If get contaminated material on skin – wash off immediately and inform Site Supervisor, monitor for ill effects (rashes, headache, dizziness, blurred vision, eye irritation)
☒	People under the influence of alcohol / drugs will not be permitted on site
☒	Eat only in designated 'clean' area or offsite, and after washing hands
☒	Work only when WorleyParsons representative is supervising or unless told otherwise
☒	Stop until told to continue, rather than continue until told to stop
☒	If unsure about what is required or any concerns about H&S issues: stop work and ask the Site Supervisor.
	SITE/TASK SPECIFIC
☒	Sign in and out (if appropriate)
☒	Security issues, including locking gates, fencing, barrier tape, signage, etc.
☒	Outline route to hospital, emergency numbers, where this info is posted
☒	Likely contamination to be encountered, and possible locations
☒	Services on site, and their location (include overhead)
☒	Go through all identified on-site hazards (<i>refer to Site Hazard Analysis Form on next page</i>)
☒	Any additional PPE requirements (<i>as appropriate - see Hazard Analysis Form on next page</i>)
	WORKING METHODS
☒	Use relevant Safety Alerts from the Red Box and describe issues and lessons learnt <i>Posted in cabin</i>
☒	WP and subcontractor approved method statements must be followed (<i>see HSSE Plan appendices</i>)
☒	STOP and reassess risks if site/location/situation specific circumstances are not covered by an existing method statement / risk assessment. Record any changes or new procedures in this HSSE Plan. <i>LPG</i>
☒	Drillers – method of working (starter pits to <i>1.2 m</i> , recirculate water, stop drilling if any obstruction, disposal of drilling water, refuelling, etc) <i>1.5 m</i>
☒	JCB driver – method of working (general hazards of site plant, banksman, mini digger first, plastic sheeting, backfill in reverse order, compact material, refuelling, etc)
☒	Working under Permit to Work – go through any requirements of the permit in detail, get signatures
☒	Emphasise Environmental Aspects (ISO14001)
	FINISH
	Request drillers, JCB drivers, etc to give professional opinions about tasks and H&S issues
	Does anyone have any questions or helpful comments, suggestions?
	Advise site personnel to read HSSE Plan and sign Site Induction Sign-Off Sheet if no concerns or other issues to raise.



SITE HAZARD ANALYSIS FORM

1. This form is to be COMPLETED WHEN FIRST COMING TO SITE and updated as required during the site work for all subsequent induction sessions.
2. REFER TO MAIN RISK ASSESSMENT TABLE TO REVIEW TASKS, HAZARDS AND CONTROL MEASURES RELEVANT TO THE PERSON BEING INDUCTED.
3. The hazards identified should be discussed in all SITE INDUCTIONS as relevant.

IDENTIFIED HAZARDS:

☐ Confined Space	☒ Flammables (fire/explosion)	☒ Mobile Plant (drill rig, excavator)
☒ High Risk Positioning	☒ Chemical Contact (COSHH)	☒ Sharps
☐ Poor Lighting	☒ Gas (toxic/non-life supporting)	☐ Aggressive Behaviour
☒ Extreme Temperatures	☒ Electric Shock	☐ Plants/Animals
☒ Sun Exposure	☒ Site Traffic	☒ Driving (incl. total hours)
☒ Hazardous Vapour Concs	☒ Uneven ground – slips/trips/falls	☒ Overhead services – <i>water</i>
☐ Poor Ventilation	☒ Hazardous Materials	☒ Overhead Obstructions – <i>infrastructure</i>
☒ Dangerous Pressure	☒ Contaminated Soil/Water	☒ Underground Services
☐ Radiation	☒ Deep Water	☒ Underground Tanks
☒ Manual Handling	☒ Excavations	☒ UXO (<i>possible</i>)
☒ Hand Tools	☒ Isolated Site/Poor Visibility	☒ Poor Housekeeping

Other (specify):

SPECIFIC HEALTH & SAFETY PRECAUTIONS TO BE DISCUSSED:

- Sunscreen & plenty of fluids
- No mobiles in AGI (NGG red areas)
- Some roadways are ONE WAY – be aware when driving
- Deepwater in FLOGAS compound
- Water pipes overhead in FLOGAS compound
- Overhead infrastructure in NGG red areas
- Use ^{cone off} herras fencing around vac-ex truck & drill rig & ICB

PERMITS REQ FOR FLOGAS & NGG AREAS

REQUIRED PPE (in addition to minimum):



The undersigned have been given the opportunity to read this Health, Safety, Security & Environment Plan and have attended a safety induction presented by the WorleyParsons Site Supervisor, at which the site rules were defined and an overview of site conditions and emergency arrangements was given. Signature indicates understanding of the information provided and agreement to comply with the site rules.

SITE INDUCTION SIGN-OFF SHEET					Competency Check (initialed)
NAME	COMPANY	MOBILE PHONE NUMBER	SIGNED	DATE	
T. COLES	SERVICE LOCATION	07526730214	<i>[Signature]</i>	11/5/11	DS
D Murray	OSPS	0780466195	<i>[Signature]</i>	17/5/11	DS
N FINNAN	OSDS	07519127261	<i>[Signature]</i>	17/5/11	DS
CHAUKE	CCGI	0774904487	<i>[Signature]</i>	17/5/11	CM
SHAWTHORNE	CCGI	" "	S. Hammett	1/6/11	CM
I. D.	HARVEY PLANT	07754628585	I. D.	13/6/2011	AT
A Shields	Worley Parsons	07500 868622	<i>[Signature]</i>	13/6/2011	AT
G. JONES	NAP	07789305303	<i>[Signature]</i>	13/6/11	AT
K Buchanan	Confluence	—	<i>[Signature]</i>	14/6/11	AT
H Spire	Equipe	07831341884	H Spire	14/6/11	
N. Glynn	Worley Parsons	0797938559	<i>[Signature]</i>	14/6/11	AT
P. HARVEY	HARVEY PLANT	07930443668	<i>[Signature]</i>	20/6/11	AT - CSCS 2249413
S. PUGH	C+S		S. Pugh	07/07/11	DS
C. Mathews	C+S	07599118652	C. MATHIEWS	07/07/11	DS
S. Hughes			S. Hughes	07/07/11	DS
R. McARDLE	ABS	07949664026	<i>[Signature]</i>	23/8/11	
R. ARTHUR	ABS	07816974783	<i>[Signature]</i>	23/8/11	

Note: for competency check the Site Supervisor must initial the form to indicate that the relevant documents have been viewed and copies retained (or licence/card number recorded) in the appropriate Appendix of this HSSE Plan.



HSSE Plan (Full SI) Inc Tarmac 50065-29.doc



RESPIRATOR INSPECTION FORM			
TASK:	Site Investigation		
NAME:	DATE:		
MAKE:			
MODEL:	NO:		
SIZE:			
CHECKLIST			
For the following please tick Yes, No or N/A			
	YES	NO	N/A
1. FACEPIECE:			
Is the facepiece in good condition?			
Is the lens clean and un-distorted?			
2. STRAPS:			
Are the straps in good condition?			
3. VALVES:			
Are the inhalation valves in good condition?			
Is the exhalation valve in good condition?			
Is the exhalation valve cover present & in good condition?			
4. CARTRIDGES/FILTERS:			
Are the cartridges in good condition?			
Are the gaskets clean in good condition?			
COMMENTS/DEFICIENCIES			

Copy this form as required for subsequent inspections



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MAELOR WORKS, WREXHAM

SI CONSTRUCTION PHASE HSSE PLAN

OSDS & CC Grand Inv (drill rig + excavator)

SUBCONTRACTOR EQUIPMENT INSPECTION FORM

TASK: Site Investigation

TO BE COMPLETED BY THE LEAD SUBCONTRACTOR ON A WEEKLY BASIS

THE FOLLOWING EQUIPMENT HAS BEEN INSPECTED AND IS FIT FOR PURPOSE:

Detail of equipment	Name	Signed	Date
VACUUM + Coring equip	Donie/Murray	D Murray	11/5/11
Drill Rig	Chuke	Chuke	11/5/11
JCB SCX	I D...	I D...	13/6/2011
Drill Rig	Chuke	Chuke	13/6/11
JCB SCX	P. HARVEY.	P. Harvey	20/6/11

COMMENTS/DEFICIENCIES:



EMERGENCY RESPONSE PLAN

EMERGENCY PROCEDURE

1. **Ensure your own safety.** *[Stay calm. Shut down your equipment. Proceed to muster point.]*
2. **Raise the alarm** (fire alarm, vehicle horn, shout etc.).
3. **Assess the situation.** *[Do a head count]*
4. **Make the area safe.** Remove injured persons from the danger area if safe to do so.
5. **Shut down equipment** (being used as part of the works & covered by this plan).
6. **Act as required and as competent**, without exposing yourself to unacceptable risks (extinguish fire, contain spill, render first aid etc.).
7. **Telephone for emergency assistance** (fire service, paramedics) if necessary.

LOCATION OF EMERGENCY EQUIPMENT

Muster station	At door of welfare unit. Secondary: at entrance to site
Fire extinguisher(s)	In welfare unit (next to door), on back of drill rig
First Aid Kit(s)	In welfare unit, in red box in WorleyParsons vehicle (boot)
Eye wash	In welfare unit

EMERGENCY CONTACTS

Designated site First Aider	Alan Smith / <i>Chris Meek</i> ^{07899 792204}	07917 330 784
Fire, Police, Ambulance		999 or 112
WorleyParsons Incident Hotline	Bristol Office (reception)	0117 925 1304
Gas	National Gas Emergency Number	0800 111 999
Electricity	SP Power Systems Ltd (manweb)	0845 272 2424
Sewerage	Dwr Cymru (Welsh water)	0800 052 0130
Water	Dee Valley Water	01978 846946
Environment Agency	Emergency number	0800 807060
Project Manager	Natasha Glynn	07979738859
HSSE Advisor	Tim Bartlett	07968807496
Client – National Grid	IMS Incident Line	0800 777770
CDM Co-ordinator	Ken Buchanan	077017760121

PROCEDURE FOR CONTACTING EMERGENCY SERVICES

When calling for assistance in an emergency situation, provide the following information:

- Name of person making call;
- Telephone number and location of person making call;
- Name of person(s) exposed or injured and location;
- Nature of emergency and type of exposure, when appropriate; and,
- Actions already taken.

Never hang up first. Wait for the operator to finish all questions.



EMERGENCY RESPONSE PLAN - PART 2

2-4-24 INCIDENT/NEAR MISS REPORTING

Report as soon as reasonably practicable:

- **Within 2h** to site supervisor
- **Within 4h** to the WorleyParsons Hotline, the WP Project Manager and the CDM co-ordinator
- **Within 24h** provide written report to HSSE Advisor
- To the client (following their requirements)
- To the public relations company (if applicable)

The HSSE Advisor will complete RIDDOR reporting (if necessary).

Investigate as soon as possible:

- Don't disturb the area, except to make safe.
- Take photographs of the scene, equipment, and/or any injuries.
- Interview witnesses, record statements.
- Look for possible causes.

NEAREST HOSPITAL WITH A&E FACILITIES

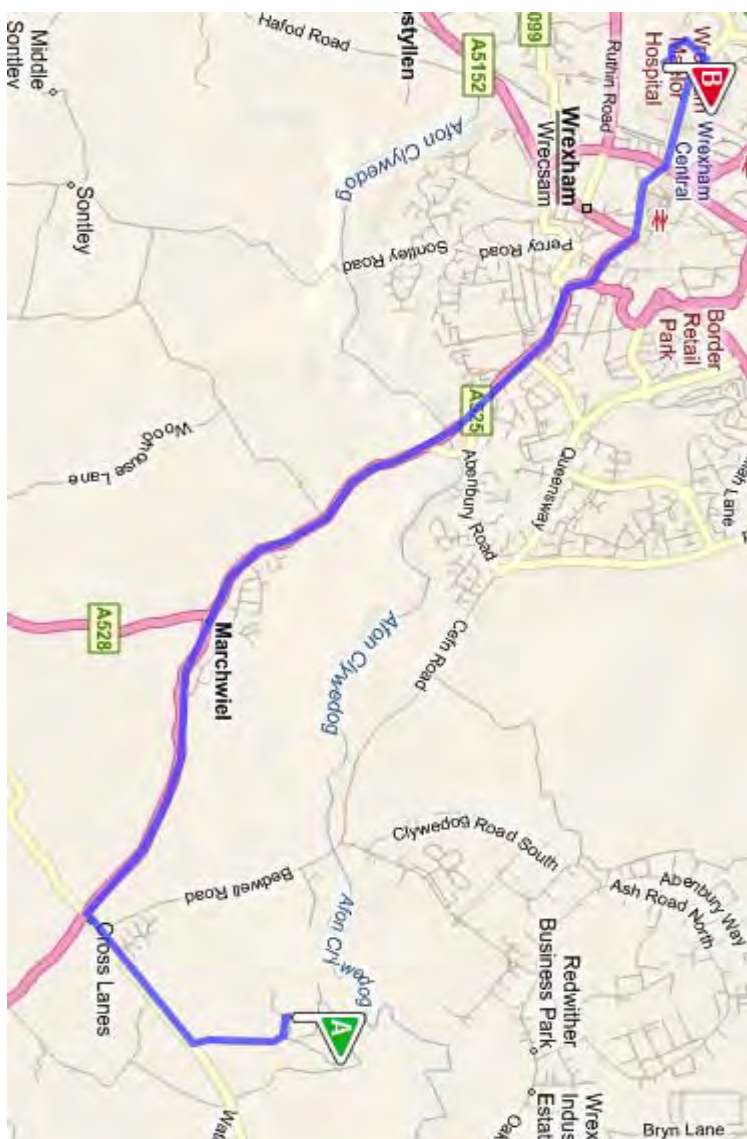
Wrexham Maelor Hospital

Croesnewydd Road
Wrexham
LL13 7TD

Telephone: 01978 291100

Directions from site:

- Depart from LL13 0UW,
* Private Road
- Turn right onto B51300
- Bear right onto A5253
- Turn left onto Rhodfa San Silwyn / St Giles Way
- Road name changes to Brook Street
- Road name changes to Pentrefelin
- At roundabout, take 2nd exit onto Watery Road
- Road name changes to Croesnewydd Road
- Turn left onto road
- Arrive at LL13 7TD, Wrexham on the left. The last intersection is Croesnewydd Road





To be confirmed when dates of lone working are known

REMOTE/LONE WORKING ARRANGEMENTS

The following section should be completed in all cases where lone site working is expected. A copy of these procedures should be retained by each nominated responsible person and the office administrator.

LONE WORKING DATES: TBC as required *22/23/24 June 2011*

NOMINATED EMERGENCY CONTACTS

Lone Worker	<i>ALAN SMITH</i>	<i>0791 7 330 734</i>
Primary Responsible Person	<i>NATASHA GLYNN</i>	<i>0117 9105 123</i>
Secondary Responsible Person	<i>CHRIS MCKIN</i>	<i>07899 792204</i>
Office Administration	<i>PAULA LOSBY</i>	<i>0117 925 1304</i>
Alternative Contact	<i>PAT MONKS</i>	<i>0117 9105 125</i>
WorleyParsons Incident Hotline		0117 925 1304
WorleyParsons R3 24h hotline	Europe/Africa	+44 208 222 8380

GENERAL PROCEDURE

1. Include a detailed risk assessment in the HSSE plan that considers site location, conditions and circumstances for lone working.
2. Nominate two Responsible Persons within your team/office to act as primary and secondary emergency contacts and discuss/agree the procedures with both.
3. Complete the **Nominated Emergency Contacts** and **Agreed Procedure for Contacting Responsible Persons** sections appropriate to your tasks and assessed risk.
4. Ensure that all Responsible Persons and the office admin retain a copy of these procedures.
5. Inform the office manager and project manager of your travel plans. Fill in the office diary.
6. Be aware of any changing circumstances and re-evaluate risks. Modify your working or emergency procedures as required – document any changes in your HSSE Plan.
7. Ensure that all nominated responsible persons and the project manager are aware of additional hazards or changes to agreed working procedures and agree an appropriate course of action.
8. Your equipment should include: a fully charged mobile phone, an attack alarm, a first aid kit.
9. FOLLOW THE PHONE-IN PROCEDURE.

AGREED PROCEDURE FOR CONTACTING RESPONSIBLE PERSONS

FIELD STAFF – A check-in phone call will be undertaken twice daily by phoning the primary responsible person by *08:00 and 17:30*. If the primary responsible person cannot be contacted, the secondary responsible person will be called. If contact can not be made with either responsible person the site staff should call their local office administration.

RESPONSIBLE PERSONS – If no contact has been received by the primary or secondary responsible person *within two hours* of the agreed call-in time (i.e. by *10:00 & 19:30*) the primary responsible person will attempt to call the field staff direct. If no contact has been made with field staff *within four hours* of the agreed phone in time (i.e. by *12:00 & 21:30*) the responsible persons will attempt to call alternative contact numbers. If the issue has not been resolved to the satisfaction of the responsible person and management team *within five hours* of the agreed phone in time (*13:00 & 22:30*), the primary responsible person will contact the **WorleyParsons R3, 24 hour hotline (+44 208 222 8380)** and commence missing person emergency procedures.



POST-JOB HSSE REPORT / FEEDBACK FORM

Site Supervisor to complete this form at the end of site work and discuss with HSSE Advisor who signed the HSSE Plan

SITE: Maelor Works, Wrexham _____ **JOB NO:** 50065-29 _____

CLIENT: _____ **DATES:** _____

TYPE(S) OF WORK: Site Investigation _____

HAZARDS IDENTIFIED:

Description of Hazard

Date

Control Measure Applied

1)

2)

3)

4)

5)

6)

7)

LIST OF INCIDENTS AND/OR NEAR MISSES:

Short Description

Date

Reported?

1)

2)

3)

TIME LOST DUE TO HSSE CONCERNS:

RECOMMENDATIONS FOR IMPROVEMENTS TO HSSE ARRANGEMENTS FOR FUTURE WORK:

SIGNATURE OF SITE SUPERVISOR: _____ **DATE:** _____

☐ I confirm that, to the best of my knowledge, the provisions in the project HSSE Plan were followed and associated documents have been completed.

SIGNATURE OF PROJECT MANAGER: _____ **DATE:** _____

☐ I have reviewed the information in this report with the Site Supervisor and/or Project Manager.

SIGNATURE OF HSSE ADVISOR: _____ **DATE:** _____



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APPENDIX VI	WORLEYPARSONS METHOD STATEMENTS AND RISK ASSESSMENTS
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APPENDIX VIII	DAILY SITE RECORD FORMS
APPENDIX IX	INCIDENT/NEAR MISS REPORT FORM

FIGURES

FIGURE 1	COMPOSITE SITE SERVICES, CONSTRAINTS AND INVESTIGATION SUMMARY PLAN
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1. PROJECT ARRANGEMENTS AND CONTACTS

Site Location	Maelor Gasworks Marchwiel Wrexham LL13 0UW	
Client	St Catherine's Lodge Bearwood Rd Wokingham Berkshire RG41 5BN	Contact name: Scott Lewis Telephone: 01926 654718 07795 666320
Consultant /	WorleyParsons	Project Manager: Natasha Glynn
Principal	3-8 Redcliffe Parade West	Telephone: 0117 9105 123
Contractor	Bristol BS1 6SP	0117 925 1304 Mobile: 07979 738 859
		Site Supervisor: Alan Smith Mobile: 07917 330 784
		HSSE Advisor: Tim Bartlett Telephone: 0117 9105 103 Mobile: 0796 880 7496
CDM	Confluence PCM,	Contact name: Ken Buchanan
Co-ordinator	Level 1, 8 Heron Quays, London E14 4JB	Telephone: 0207 5102485 Mobile: 077017760121
Public Relations	JBP The White House 6 Whiteladies Road Clifton Bristol BS8 1PD	0117 907 3400
National Grid Gas (Plant Protection)	Wales and West Utilities (WWU) 02920 278912	Contact name: Karl Toozer Telephone: 01978 782 903 07791 407 063
Service Tracing and Equipment	Service Location UK Ltd Survey House 22 Hillview Lane, Twynning, Tewkesbury, Gloucestershire, GL20 6JN	Contact name: Rob Asquith Telephone: (07979) 367282

Vacuum Excavation	OSDS Ltd 238 Menlove Avenue, Liverpool L18 3JF	Contact name: Steve Dunmore Telephone: 0151 222 6140 Mobile: 07802 966995
Sample Analysis (soils and groundwater)	Scientifics (formally TES Bretby) ESG House Bretby Business Park Ashby Rd Bretby Burton Upon Trent DE15 0XD	Contact name: S Hulligan Telephone: 01283 554467 01283 554541 sample collection
Equipment	Pollution Control Technologies 3 - 8 Redcliffe Parade West Bristol BS1 6SP	Contact name: Emily Smith Telephone: 0117 925 1304
Solid & Liquid Waste Disposal	ChemTech Waste Alchemy House Coppice Side Industrial Park Brownhills WS8 7EU	Contact name: Dawn Silk Telephone: 0870 608 8840 09666 692 0000
Topographical Survey	Anthony Brooks 24 Church Road Stoke Gifford Bristol BS34 8QA	Contact name: Anthony Brooks Telephone: 0117 9315 325
Drilling/Trial Pits	CC Ground Investigations Ltd Unit A2 Innsworth Technology Park Innsworth Lane Gloucs GL3 1DL	Contact name: Jim Constantine Telephone: 01452 739 165
Tarmac Reinstatement	C & S Driveways C & S Driveways 26 Brook Street, Rhosllanerchrugog Wrexham LL14 2ED	Contact name: Craig Matthews or Amy Matthews Telephone: 07599 118652 01978 842837

Flogas Martin Jones

Garth Jones (NGP) 07789 305303

2. SCOPE OF WORK AND PROJECT INFORMATION

Description of Works

The works consist of the following elements:

- Non-intrusive service location to check for presence of underground services at proposed borehole and trial pit locations and to identify nearby services;
- Vacuum excavation to positively prove gas mains or other services if within 15 m of intended borehole or trial pit;
- Vacuum excavation or hand-dig to 1.5 m bgl to 'clear' inspection pits for proposed excavations;
- Mechanical excavation of up to 14 trial pits to 4 m bgl and 18 boreholes to 4 – 6 m bgl;
- Log the ground conditions encountered in the excavations and boreholes;
- Reinstatement of trial pit excavations using a subcontractor;
- Collect soil and groundwater samples for laboratory analysis; and
- Collect indoor air quality samples for analysis.

Proposed investigation locations are shown on Figure 1.

Programme of Work

11 – 13 May 2011: Non-intrusive service clearance

17 – 19 May 2011: Vacuum Excavation

Week commencing 23 May 2011 (for ~4 weeks): Drilling/Trial Pits.

Week commencing 4th July 2011 for trial pit reinstatement.

Following the completion of drilling and trial pitting, two rounds of groundwater sampling and 6 rounds of indoor air quality sampling are scheduled over a 3 month period. Site works are scheduled to be completed by mid-September 2011.

Working hours (including travel time)

Monday: 09:00 to 17:30 on site (06:00 to 20:00 including travel)

Tuesday – Friday 08:00 to 18:00 on site (07:30 to 18:30 including travel)

[08:00 to 17:00 for any noisy activity which may disturb site tenants]

Number of People on site

WorleyParsons: 1 – 2

Service Location: 1

OSDS: 2 – 3

CC Ground Investigations Ltd: 4

Anthony Brookes Surveys: 2

C & S Driveways And Tarmac Services: 2/3

Please note that the above personnel will not be all on-site at the same time

Plant/Equipment on site	1 Excavator 1 Vac ex truck 1 track mounted multi-purpose rig employing a combination of dynamic sampling & water flush rotary core drilling. 1 Mini Digger with a manual quick hitch 1 Compaction equipment i.e. Trench rammer, Roller, Stihl Saw and Hydraulic Breaker
Site Description and Boundaries	The site is located at Maelor Works, Wrexham, Clwyd at National Grid Reference (NGR) SJ 380485 approximately 5 km east-southeast of Wrexham town centre. It is jointly owned by National Grid Property Holding (NGPH) and Wales and West Utilities (WWU) and covers an area of approximately 44 acres (17.8 Ha). NGPH own a large proportion of the site and lease the land and associated buildings to WWU and Flogas (a gas supplier). WWU own two areas of the site, one in the west of the site which is occupied by a number of small gas infrastructure buildings and pipe work and one in the north east of the site which houses live gas infrastructure collectively known as the Above Ground Installation (AGI). Gas storage bullets belonging to Flogas are situated in the southwest corner of the site. The site is located on flat land (approximately 35 metres above Ordnance Datum - m.AOD) and is surrounded on all sides by open farmland. To the north of the site lies the River Clywedog (a tributary of the River Dee) and to the south lies a brook (Bedwell Brook). Both of these water courses drain to the east.
Adjacent Land Use	The site is surrounded on all sides by open farmland, all laid to pasture. The Wrexham Industrial Estate lies 1 km to the north of the site, on the opposite bank of the river Clywedog.
Access Arrangements	Access to the site is via a lane off the B5130. Various sets of locked gates are present on site. Access through these is to be arranged via consultation with Scott Lewis (NGPH), Karl Toozer (WWU) and the on-site tenants.
Site History	From 1940 until World War II the current site was occupied by a Royal Ordnance Factory, which covered an area of 1400 acres. Explosives were manufactured in a number of production units, widely separated to minimise damage should there be an explosion. It is believed that the land currently occupied by National Grid was only used for dry storage of explosives rather than manufacture. In 1953, the Maelor Gas Works opened. The works included a wide range of process infrastructure including gasholders, retort house, condensers, purifiers, coal stores, and tar and oil/liquor storage tanks. The gas works operated until 1968 when a new oil-gas plant was built. Since 1971, the site has been used for the regulation and distribution of natural gas for the North Wales Grid and Wrexham area.



Site History	From 1940 until World War II the current site was occupied by a Royal Ordnance Factory, which covered an area of 1400 acres. Explosives were manufactured in a number of production units, widely separated to minimise damage should there be an explosion. It is believed that the land currently occupied by National Grid was only used for dry storage of explosives rather than manufacture. In 1953, the Maelor Gas Works opened. The works included a wide range of process infrastructure including gasholders, retort house, condensers, purifiers, coal stores, and tar and oil/liquor storage tanks. The gas works operated until 1968 when a new oil-gas plant was built. Since 1971, the site has been used for the regulation and distribution of natural gas for the North Wales Grid and Wrexham area.
Services	From previous site investigation works an extensive network of underground services exists on site. This includes mains water, electricity, gas, telecom and surface and foul water drainage. Within the WWU compound, located to the northeast of the NGPH site, live gas infrastructure, including high pressure gas mains exists. Liaison with WWU Plant Protection will be undertaken prior to commencing intrusive works. Given the historic nature of the site as a gasworks, redundant pipework may exist below ground and therefore may be encountered during site works. A full services survey will be undertaken prior to commencing intrusive works.
Ground conditions	Ground cover across the site consists of hardstanding, rough sloping ground and rough vegetation with semi-mature tree. The underlying geology generally consists of made ground overlying clays and silts which in turn overlies sands and gravels.
Potential Contaminants	Typical gasworks chemicals may be present and encountered during intrusive works, including tar, hydrocarbons, cyanide, sulphur etc.
Environmental Receptors	• Underlying Principal aquifer; • Surface water (brooks); • Site tenants; • Site workers; and, • Flora and fauna.
Public Relations issues	Site tenants are present, and have been informed of the proposed works.



3. HSSE MANAGEMENT ARRANGEMENTS

WorleyParsons has prepared this Construction Phase HSSE Plan in compliance with the requirements of the Construction (Design & Management) Regulations 2007.

3.1 Management Structure and Responsibilities

As Principal Contractor for the project, WorleyParsons is responsible for ensuring that its personnel and sub-contractors comply with the provisions of the plan. The WorleyParsons Project Manager and Site Supervisor are responsible for the distribution of this health and safety plan, and for compliance auditing. Prior to commencement of works on site, the Project Manager is the point of contact for discussion of health, safety and all other matters related to the project. Once works have started on site, responsibility passes to the Site Supervisor, reporting to the Project Manager.

3.1.1 Project Manager

The Project Manager is responsible for overall performance and compliance with applicable regulations and procedural guidelines as specified in this health and safety plan. The Project Manager is also responsible for implementing the provisions of this plan and its addenda. Implementation includes training of field personnel involved with the project, provision of the appropriate safety equipment, and ensuring that the required health and safety documents are submitted. The Project Manager may or may not be present on site during the works. Reporting of any incidents or near-misses is the primarily the responsibility of the Project Manager.

3.1.2 Site Supervisor

The Site Supervisor is responsible for co-ordinating and supervising technical field activities at the site. **An integral part of this duty is ensuring that work is conducted in a safe manner and in accordance with this health and safety plan.** This individual will be on site at all times during the field operations, and is responsible for controlling access to the site.

The Site Supervisor will conduct an initial site induction for all site staff and visitors, and organise daily toolbox talks. Details of these safety meetings will be recorded on the Site Induction Sign-Off Sheet and Daily Site Record Sheet (Tool Box Talk section) respectively. He/She will observe operating personnel and authorised visitors for indications of impaired health due to contaminant exposure, heat stress or other hazards.

The Site Supervisor will evaluate whether site conditions present hazards not previously predicted or expected, and will inspect personal protective equipment and verify its use. He/She will make daily assessments of health and safety practices at the site, and will ensure that supplies of safety equipment are maintained.

The Site Supervisor may delegate supervision of service location and hand-digging activities to the contracting supervisor, who will be suitably experienced and competent in supervision of these activities.

The Site Supervisor will contact the Project Manager by phone at the end of every site working day, to brief the Project Manager on progress and to discuss any HSSE or other issues that may have arisen.



3.1.3 Suitably Competent Personnel

All site personnel are required to have qualifications appropriate to their particular duty. The Site Supervisor must be able to demonstrate competence in his/her role, and in particular must comply with the National Grid Property Holdings document 'Draft Generic Profile for Head Engineer/Supervisor'.

Sub-contractor's personnel will be required to read this HSSE Plan and acknowledge by signature. Documentary evidence of the competency of sub-contractor's personnel will be checked and details recorded in this HSSE Plan.

With particular reference to the use of quick release hitches on excavators, a self-assessment and declaration of competence will be completed by all excavator operators. This form is held in Appendix IV (Site Staff Competency Records).

Copies of personnel competency records will be included in Appendix IV as appropriate.

3.2 Health, Safety and Environmental Goals, Monitoring and Review

3.2.1 Health and Safety Goals

The health and safety goals of this project are to:

- Undertake the work in compliance with all current Health and Safety legislation;
- Comply with any additional requirements as defined by the client (see National Grid Property Holdings HS&E Policy);
- Complete the works free from risk as far as is practically possible;
- Prevent accidents occurring during the works and to prevent long-term effects of illness;
- Minimise disruption to the public;
- Maintain safe and unimpeded access and egress from the site; and,
- Complete the works in accordance with the programme and specified quality standards without putting people's health and safety at risk.

3.2.2 Environmental Goals

The environmental goals of this project are to:

- Undertake the work in compliance with all current environmental legislation;
- Comply with any additional requirements as defined by the client;
- Minimise environmental and archaeological damage;
- Minimise the production of waste, wherever possible;
- Store, handle, use, transport and dispose of materials in a manner that minimises their potential for damaging the environment;
- Be aware of environmentally sensitive receptors on site and in close proximity to the site; and,
- Undertake works in such a way to minimise the effects on environmentally sensitive receptors on site and in close proximity to the site.



3.2.3 Health and Safety Monitoring and Review

The Site Supervisor will actively monitor Health, Safety and Environmental performance on site. The works may be inspected by the WorleyParsons HSSE Advisor, or by the client's representative.

During weekly safety meetings and on completion of the project, a review will take place to assess how the standards set compared with those actually achieved in order that any shortcomings can be addressed for the remainder of the project and/or for other projects in the future.

3.3 Arrangements for Communication

3.3.1 Liaison between Parties and Handling Design Changes

Work will not commence on site until a Works Commencement Authorisation Form has been received from National Grid Property Holdings. On National Grid Gas sites a Permit to Work / Form of Authority will be arranged as required before work commences.

Any design work carried out during the construction phase (i.e. changes to the original design) will be issued to appropriate parties, including the Client, CDM Co-ordinator and Site Supervisor, and will include appropriate designer's risk identification and assessment in compliance with obligations identified under the Construction (Design & Management) Regulations 2007. The Site Supervisor is responsible for ensuring that information is passed to relevant parties on-site.

3.3.2 External Consultation

The requirement for liaison with external parties, including nearby residents and the general public, will be assessed before works start on site, involving any public relations consultant retained by the client. If conditions arise after works have commenced, such that further consultation or liaison is required, this will be addressed by the Site Supervisor, who is entitled to suspend operations if considered necessary.

3.3.3 Liaison with the CDM Co-ordinator

The Project Manager will provide information to the CDM Co-ordinator prior to, during and after the works as required, particularly where changes in the design or scope of the works are made. The following will be supplied to the CDM Co-ordinator after the site work has finished:

- A copy of this construction Health and Safety Plan;
- A copy of the Factual Site Investigation Report for the work, and;
- A copy of the updated Site Constraints Plan.

3.3.4 Selection and Control of Sub-contractors

Sub-contractors and suppliers used on the project will be Approved Suppliers in accordance with WorleyParsons' quality assurance procedures. The following information will be requested from sub-contractors and suppliers as appropriate, and will be held on file:

- Health and Safety Policy.
- Insurance details.
- Risk, manual handling and COSHH assessments where appropriate.
- Method statements as necessary.



- Confirmation that any plant to be used is properly selected and maintained.
- Confirmation that plant / equipment operators are properly trained.

Sub-contractors providing services involving higher risk, such as drillers, will be audited by WorleyParsons before being designated an Approved Supplier.

Relevant sub-contractor method statements and risk assessments will be reviewed in detail and recorded on the Contractor Risk Assessment & Method Statement Review Form before being accepted, to ensure that they are **site specific, fit for purpose** and **cover potential fault conditions** (i.e. non-standard operations). If fault conditions are encountered that are not covered by the submitted risk assessments, a risk assessment will be carried out and agreed in the field. The accepted documents are included in Appendix V.

All HSE warnings to sub-contractor staff will be recorded and communicated to the contracting company, and WP project manager, and reported generally as near-miss incidents.

3.3.5 Exchange of Health and Safety Information with Site Personnel

The Site Supervisor has overall responsibility for the direction and co-ordination of the works on site, although certain aspects may be delegated to other WorleyParsons personnel. All persons employed on the project and visitors to the site will be required to attend an induction, presented by the Site Supervisor at the start of works on each site (see below).

Safety matters will be discussed during the induction and during daily and impromptu 'tool-box' talks during the duration of the work. These meetings will be used to communicate any amendments or additions to the site arrangements and rules, and details will be recorded on the Daily Site Record Sheets.

3.3.6 Safety Training Induction

The site rules and health, safety and environmental issues are included in the safety training induction which is presented to all persons employed on the project and site visitors by the Site Supervisor. The induction will be based on the checklist provided at the front of this Plan.

In addition, a hazard assessment will be carried out immediately prior to the start of works at the site. Details will be recorded on the Site Hazard Analysis Form (included at the front of this Plan) and will form part of the initial site health & safety induction.

Induction includes:

- Site hazards and mitigating measures (using information in Section 5, Appendices as appropriate, and additional information noted from the Site Hazard Analysis Form);
- Relevant Safety Alerts;
- Duties and responsibilities of all staff;
- Appropriate methods of working;
- Definition of working areas on site (for example clean, refuelling, parking areas);
- The name of the qualified first aider(s) and the location of the first aid box;
- Emergency response procedures;
- Arrangements for welfare matters; and,
- Any other information which is important with respect to the site.

As part of National Grid site procedures, the National Grid Golden Rules (see Appendix III) will form part of the site induction. The Golden Rules will be clearly displayed in the welfare unit on site.



3.3.7 Management of Change

When a change occurs, the following steps must be followed:

- 1) **Recognize the change.** Some examples of common causes of changes to field programs/tasks include:
 - change of programme/task scope (including change of technical scope, budget and timeline);
 - change to work methods or procedures;
 - change of equipment/materials to be used;
 - change of personnel on site;
 - weather conditions;
 - site conditions or topography;
 - unanticipated contamination (or larger than expected volume);
 - unexpected services;
 - pace of work slower than expected (change to timeline/budget);
 - additional contractors required;
 - limited or restricted access;
 - travel delays;
 - unexpected visitors;
 - delay of arrival of equipment/personnel/contractors;
 - accidents / near misses.

Note: this list is not exhaustive.
- 2) **Reassess the risks and discuss them** with the Project Manager or HSSE Advisor.
- 3) **Document the change** in the HSSE Plan or Office Risk Assessment. The following details should be included in any documentation of change as appropriate:
 - who is making/documenting the change;
 - personnel impacted;
 - task to be changed;
 - additions or deletions from the risk assessment, and associated control measures;
 - when the change takes effect;
 - whether the change is temporary (if so, what it applies to) or whether it is to be in place for the remainder of the job (when/if the change expires);
 - reason for change;
 - contractors involved;
 - additional preparation/equipment/training required;
 - changes to other HSSE documentation required/completed (e.g. ERP, risk assessment);
 - additional HSSE policies involved;
 - how the change is communicated to all involved;
 - regulations/legislation involved/considered;
 - who has approved the change;
 - whether or not it requires ISO 9001 documentation; and,
 - the signature and date of those involved.
- 4) **Communicate** the implications of the change to all involved parties.
- 5) **Implement** the change.



3.3.8 Reporting and Investigation of Incidents and Near Misses

WorleyParsons requires that all incidents will be reported to the company Health and Safety Advisor and an Incident Report Form completed (blank form provided in Appendix IX). Incidents and Near Misses are defined as follows:

Near Miss: Any occurrence, but without loss or consequence, that had the potential to cause harm to people, environment, equipment and/or property.

Incident: Any occurrence, event or series of events that results in a fatality, injury, illness to any person, damage to or loss of property, equipment, material or the environment.

The WorleyParsons Project Manager will report and investigate all incidents and near misses according to the relevant corporate WorleyParsons procedures, with assistance from the Health and Safety Advisor as required.

The WorleyParsons Health and Safety Advisor is responsible for reporting accidents, ill health and dangerous occurrences to the Health and Safety Executive under the terms of the Reporting of Injuries, Disease and Dangerous Occurrence Regulations, 1995.



3.4 Site Rules

The following is a summary of the arrangements and rules, pertaining to health and safety, which will be in force for the duration of the project.

1. The WorleyParsons Site Supervisor is in charge of all activities on site during the works.
2. The provisions of the WorleyParsons HSSE Plan (this document) must be followed at all times.
3. All persons entering the site must advise the Site Supervisor of their arrival and departure.
4. The entrance to the site will be kept locked at all times.
5. Persons having consumed alcohol or drugs will not be permitted on the site.
6. **Smoking is not permitted on site.** Eating and drinking is only permitted in a designated area as defined during the safety induction. PPE must be removed before entering this area, and the hands must be thoroughly washed.
7. Minimum Personal Protective Equipment (PPE) is to be correctly worn at all times other than in the clean area or as specified:
 - Safety boots with reinforced toecaps and soles (laced boots for NGG sites)
 - Hard Hat
 - Safety glasses/goggles as appropriate during all intrusive work
 - High visibility vest or jacket
 - Chemically resistant overalls
8. The following PPE must be available to all personnel and should be worn when deemed necessary or instructed by a WorleyParsons representative:
 - Suitable gloves (chemical-resistant gloves when necessary)
 - Half- or full-face respirator with suitable cartridge
 - Ear defenders
 - Appropriate warm clothes as conditions dictate
9. If an unanticipated, potentially hazardous material or situation is encountered, then work must cease until the occurrence has been assessed. **If in doubt, stop work.**
10. Avoid contact with any contaminated or potentially contaminated material or surface.
11. Any ill effects must be reported at once, e.g. headache, dizziness, blurred vision, eye irritation.
12. All personnel should look for signs of distress in others – e.g. skin rashes or discolouration, signs of incoordination, changes of demeanour, salivation, capillary responses, nervousness or excitability.
13. In the event of any incident or accident the site supervisor must be called to the scene immediately.
14. Individuals may only carry out tasks for which they are competent and authorised.
15. **No work will be undertaken unless previously agreed with the WorleyParsons representative.**



16. Methods of work should follow appropriate method statements presented in Appendices IV and VI.
17. Work in National Grid Gas areas will be conducted under a form of Authority or Permit to Work, which will be issued by National Grid Gas's Authorising Engineer to the Site Supervisor.
18. National Grid Gas Document SSW/22: "Specification for safe working in the vicinity of Transco High Pressure Gas Pipelines and associated installations – Requirements for Third Parties" included in Appendix III of this Volume is to be adhered to under the appropriate circumstances.
19. National Grid Gas document T/PR/D/3: "Inspection and Prevention of Damage to National Grid Plant operating at Pressures up to 7 bar" included in Appendix III of this Volume is to be adhered to under the appropriate circumstances.
20. Appropriate attention will be given to other site users, personnel and local residents, phasing works to suit and avoiding or minimising nuisance by the use of noise, vibration and dust monitoring suppression measures.



4. HEALTH & SAFETY AND ENVIRONMENTAL RISK ASSESSMENT

4.1 Introduction

This Section considers the hazards and risks associated with the proposed site works, and ensures that they are adequately and properly assessed.

A **hazard** is something with the potential to cause harm in particular circumstances.

Risk is a combined estimate of the likelihood and severity of a defined hazard.

Risk assessment procedure:

- a) Identify hazards;
- b) Eliminate hazard from work procedure if possible;
- c) Assess risk associated with remaining hazards (assign values to Likelihood and Severity; multiply, and identify risk category);
- d) Identify measures to control risks;
- e) Assess residual risk and decide whether it is acceptable (i.e. Low).

Hazard prompt list (not exhaustive):

- | | | | |
|---------------------------------|---------------------------------|---------------------------------------|-----------------------------|
| ▪ Slips, trips, falls | ▪ Underground services | ▪ Falls from height (incl. into pits) | ▪ Noise |
| ▪ Manual handling | ▪ Mechanical lifting operations | ▪ Falling objects from height | ▪ Static posture |
| ▪ Adverse weather | ▪ Use of machines | ▪ Contact with chemicals | ▪ Repetitive movement |
| ▪ Poor housekeeping | ▪ Use of hand tools | ▪ Vapours/fumes | ▪ Radioactivity |
| ▪ Operation of plant & vehicles | ▪ Fire | ▪ Dust | ▪ UXO (unexploded ordnance) |

Ensure that you have considered/addressed ALL hazards for your site.

Estimate risk:

Likelihood value (L)	Severity/consequence value (S)	Risk I = Likelihood (L) x Severity (S)	Assessed Risk		
1 = improbable	1 = trivial injury				
2 = unlikely	2 = minor injury (first aid only)		1 – 6	=	Low
3 = even chance	3 = injury or illness (lost time)		7 – 12	=	Moderate
4 = likely	4 = major injury (reportable)		13 – 25	=	High
5 = almost certain	5 = severe incapacity / death		(or see matrix below)		

Hierarchy of Risk Control Measures to apply:

- Eliminate - Do away with process, article or substance;
- Reduce - Use a safer product, substance or procedure;
- Isolation - Guards, barriers, remote operation;
- Controls - Safe system of work (training, instruction, supervision, reduce exposure);
- PPE - Last resort, and as a temporary measure;
- Discipline - Behaviour, signs and posters.

LIKELIHOOD	SEVERITY				
	1	2	3	4	5
1	L	L	L	L	L
2	L	L	L	M	M
3	L	L	M	M	H
4	L	M	M	H	H
5	L	M	H	H	H



4.2 H&S Hazards and Risk Assessment

The following table identifies the hazards associated with proposed site work and assesses the risk of personal harm occurring. Risk control measures are listed and the residual risk assessed. The residual risk must be assessed as Low for the operation to proceed.

Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Driving	Use of vehicle to drive to or from the site	Site staff	2	5	Mod	- Plan the journey – use the Journey & Vehicle Check Form for all business journeys. - Assess weather forecast/road reports and incorporate in journey planning as appropriate. - Appropriate checks on vehicle prior to journey. - Consideration of total working hours for the day, including office, driving and site time. - Site working time on Mondays and Fridays is to be reduced to allow for sufficient travelling time. - Competent person as designated driver (adequate training/experience). - Care and attention while driving. - No use of mobile phone by driver while driving. - No driving if tired or unwell. - Regular breaks during driving as appropriate. - Overnight accommodation during site visits/works as appropriate.	1	5	Low
General	Weather conditions (heat)	Site Staff	5	3	High	- Cover skin or use sun screen as appropriate. - Protect head and back of neck (do not compromise correct functioning of hard hat). - Drink plenty of fluid. - Rest in shade at intervals as required.	2	3	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Weather conditions (cold, wet)	Site Staff	4	3	Mod	- Wear sufficient warm clothing. - Use adequate waterproof clothing to stay dry. - Use hot drinks to stay warm. - Warm up in a warm, dry location at intervals as required.	1	3	Low
Walking around site	Trip/slip	Site staff, visitors	3	2	Low-Mod	- Care and attention. - Appropriate footwear. - The working areas will be kept in a clean and tidy state. Arisings from excavation works will be removed from working areas. - Potential trip hazards will be removed or spray painted where practicable to do so. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	2	Low
	Fall into open excavations	Site staff, visitors	2	3	Low-Mod	- Trial pits will be fenced off with appropriate barriers at the observation end during excavation. - Whenever possible excavations will be backfilled immediately and not left open. - If pits are left open, they will be fenced off using appropriate fencing. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	3	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Collision with site personnel or members of public / damage to boundary walls	Site staff, visitors, members of public	3	5	High	- The size of vehicles visiting the site shall be kept to a minimum. - Plan the movement of large vehicles (as appropriate) - Site personnel shall wear high visibility clothing during the site works. - A designated and marked parking area. - Use a banksman if necessary.	1	5	Low
Transit of vehicles onto and off site	Unsafe lifting operation (e.g. shipping container)	Delivery person, site staff	2	4	Mod	- Check supplier RA/MS for unloading/loading task. - Use JSA form if RA/MS not available. - Designate banksman and discuss/plan task, communication, etc. - Ensure safe method of access to fix lifting chains is used.	1	4	Low
Delivery or collection of plant /	Unsafe manual handling (e.g. waste drums)	Delivery person	2	4	Mod	- Check supplier RA/MS for unloading/loading task. - Use mechanical assistance whenever possible. - Adequate hand protection.	1	3	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
materials / equipment from site	Collision with above-ground structures and site personnel	Site staff, visitors	3	5	High	• Approved sub-contractor with competent site operatives. • Include reminder of plant safety and 'hazard zones' in site induction. • Personnel to remain outside 'hazard zone' unless required to enter for a specific task, and then only following discussion of the task with the operator. • A WorleyParsons representative or other designated banksman with appropriate training will supervise all plant movements. • PPE – high visibility clothing to be worn at all times. • Hazards of restricted space and nearby obstructions will be assessed and discussed before individual plant operations. • Adequate training, care and attention. • Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4). • Fencing/barrier tape will be used around working areas as appropriate.	1	5	Low
Vehicles and plant movement	Manual Handling	Site staff	3	4	Mod	• Approved sub-contractor with competent site operatives. • PPE – steel toe capped boots, overalls, suitable gloves, and hard hat. • Adequate training, care and attention. • Manual handling risk assessments will be used as required – forms are provided in Appendix VI. • The contractor method statement is presented in Appendix V.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Vacuum Excavation/ Hand-digging	Underground utilities	Site staff, visitors	3	5	Mod	• A Permit to Work system (Ground Disturbance) will be operated. Sign off of the permit will be required before commencing any excavation works. • All site workers will be made aware of the location of services as part of the site induction. • Adequate training, care and attention. • Only qualified personnel will operate plant (proof of competency – e.g. CITB card will be checked on-site). • Excavations deeper than 0.6m will not be entered but excavation will proceed carefully and continuous watch for services will be maintained by the Site Supervisor. • Use of appropriate tools and techniques. • The contractor method statement is presented in Appendix V. • All excavation works will be observed continuously by a WorleyParsons representative or OSDS supervisor who will watch for indications of service runs (e.g. warning tape, bedding sand, etc.) • No smoking will be allowed on site. • Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	5	Low

No excavate entered
Nt



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Vacuum Excavation	UXO	Site staff, visitors	1	5	Low	- All site workers will be made aware of the site history and the potential for UXO to exist. - Only qualified personnel will operate plant. - Excavations are to proceed with caution. - All excavation works will be observed continuously by a WorleyParsons representative or OSDS supervisor. - Should UXO be encountered then emergency procedures (Appendix VII) are to be followed. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	5	Low
Vacuum Excavation	Plant – Being struck by boom	Site staff, visitors	3	3	Mod	- Only qualified personnel will operate plant (proof of competency – e.g. CITB card - of plant drivers will be checked on-site). - Adequate training, care and attention. - Use of appropriate tools and techniques. - Appropriate PPE will be worn at all times – hard hat and high viz. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	3	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Trial Pit Excavation	Underground utilities	Site staff, visitors	3	5	High	- All site workers will be made aware of the location of services as part of the site induction. - A detailed services survey will be undertaken prior to commencing work. Up to date service plans will be available on site. - All trial pit locations will be scanned with a CAT and Genny prior to commencing works. - Only qualified personnel will operate plant (e.g. training certificate – CITB – of plant drivers will be checked on-site). - A WP representative with appropriate training, or a trained banksman, will supervise all excavations. - A flat edged bucket will be used for trial pit excavation. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	5	Low
Trial Pit Excavation	UXO	Site Staff, Visitors	1	5	Low	- All site workers will be made aware of the site history and the potential for UXO to exist. - Excavations are to proceed with caution. - Only qualified personnel will operate plant (e.g. training certificate – CITB – of plant drivers will be checked on-site). - A WP representative with appropriate training, or a trained banksman, will supervise all excavations. - A flat edged bucket will be used for trial pit excavation. - Should UXO be encountered then emergency procedures (Appendix VII) are to be followed. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	5	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Trial Pit Excavation	Above ground Utilities	Site Staff, Visitors	2	5	Mod	- All site workers will be made aware of the location of services as part of the site induction. - A detailed services survey will be undertaken prior to commencing work. Up to date service plans will be available on site. - Only qualified personnel will operate plant (e.g. training certificate – CITB – of plant drivers will be checked on-site). - A WP representative with appropriate training, or a trained banksman, will supervise all vehicle and plant movements. - A 9 m stand off from above ground electricity services will be observed. The stand off will be indicated using barriers. - A nominal 3 m stand off from above ground gas infrastructure will be observed. This will be enforced by direction from a WP representative. - Location of trial pits within the stand off areas will be avoided. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	5	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Impact with excavator bucket	Site staff, visitors	2	5	Mod	- Only qualified personnel will operate plant (proof of competency – e.g. CITB card - of plant drivers will be checked on-site). - The WorleyParsons Site Supervisor will have appropriate banksman training and will observe all excavation works and will direct the operator. - Correct PPE (including hard hat, high visibility vest and hard-toed boots) will be worn. - Works will be supervised a “safe” distance away from the excavator. - Soil sampling will be conducted from spoil placed on a stockpile adjacent to the excavation. The excavator bucket will be placed on the ground away from the stockpile before the supervisor approaches spoil stockpile. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4). - Barrier tape / fencing will be used as required to keep site visitors at a safe distance from excavation.	1	5	Low
Trial Pit excavation	Fall into open excavations	Site staff, visitors	2	5	High	- Trial pits will be fenced off with appropriate barriers at the observation end during excavation. - Whenever possible excavations will be backfilled immediately and not left open. - If pits are left open, they will be fenced off using appropriate fencing. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	5	Low
	Entry into open excavations	Site staff, site visitors & trespassers	2	5	Mod	No excavation greater than 0.6 m depth will be entered.	1	5	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Dust generation	Site staff, visitors, off-site public	3	4	Low-Mod	- Half mask respirators will be available on site and are to be worn as necessary. - Supervisor to stand up-wind of excavation where safe to do so. - Minimise vehicle movement over open ground. - At the discretion of a WP representative, water will be sprayed to suppress dust. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	4	Low
	Contaminant vapours (inhalation)	Site staff, visitors	3	4	Mod-High	- Continuous monitoring of contaminant vapour concentrations using Photo-Ionisation Detector (PID). - PPE – half face respirator to be used if deemed necessary. - Atmospheric dilution. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	1	4	Low
Trial Pit excavation	Contaminated water (direct contact)	Site staff	3	4	Mod-High	- PPE – steel toe capped boots, overalls, chemical resistant gloves and hard hat, and eye protection. - Provision of welfare facilities (including running water and eye wash) and good hygiene practices. - All contaminated clothing (overalls) to be removed before eating or drinking. - Care and attention.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Contaminated soil (direct contact)	Site staff	3	4	Mod-High	- PPE – steel toe capped boots, overalls, chemical resistant gloves and hard hat. - Provision of welfare facilities and good hygiene practices. - All contaminated clothing (overalls) to be removed before eating or drinking. - Care and attention.	1	4	Low
	Noise	Site staff, visitors, site tenants	4	2	Mod	- PPE – ear protection during breaking out of concrete and any other noisy activities. - Equipment to be turned off when not in use. - Workers to make those around aware before noisy activities start. - Working hours to be limited to 'office hours' of 8 am to 5 pm. - Site access to visitors and/or members of the public shall be controlled as set out in Rules 3 and 20 of the Site Rules (Section 4.4).	2	2	Low
Borehole drilling	Manual handling	Site staff	3	4	Mod-High	- Approved sub-contractor with competent site operatives. - Correct PPE (including hard hat, hard-toed boots and gloves) will be worn. - Adequate training, care and attention. - Manual handling risk assessments will be used as required – forms are provided in Appendix VI. - The contractor method statement is presented in Appendix V.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Contaminant vapours (inhalation)	Site staff, visitors	3	4	Mod-High	- Continuous monitoring of contaminant vapour concentrations using Photo-Ionisation Detector (PID) where odours are detected. - PPE – half face respirator to be used if deemed necessary. - Atmospheric dilution. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	4	Low
	Contaminated water (direct contact)	Site staff	3	4	High	- PPE – steel toe capped boots, overalls, chemical resistant gloves and hard hat, and eye protection. - Provision of welfare facilities (including running water and eye wash) and good hygiene practices. - All contaminated clothing (overalls) to be removed before eating or drinking. - Any potentially contaminated water produced during drilling will be pumped directly to storage containers. - Care and attention.	1	4	Low
Borehole drilling	Contaminated soil (direct contact)	Site staff	3	4	High	- PPE – steel toe capped boots, overalls, chemical resistant gloves and hard hat. - Provision of welfare facilities and good hygiene practices. - All contaminated clothing (overalls) to be removed before eating or drinking. - Care and attention.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Above ground services	Site staff, visitors	2	5	Mod	- All site workers will be made aware of the location of services as part of the site induction. - A detailed services survey will be undertaken prior to commencing work. Up to date service plans will be available on site at all times. - Only qualified personnel will operate plant. - A WP representative with appropriate training, or a trained banksman, will supervise movement of the drill rig from one location to another. - A 9 m stand off from above ground electricity services will be observed. The stand off will be indicated using barriers. - A nominal 3 m stand off from above ground gas infrastructure will be observed. This will be enforced by direction from a WP representative. - Location of boreholes within the stand off areas will be avoided. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	5	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
Borehole drilling	Underground Services	Site staff, visitors	3	5	High	- All site workers will be made aware of the location of services as part of the site induction. - A detailed services survey will be undertaken prior to commencing work. Up to date service plans will be available on site. - All borehole locations will be scanned with a CAT and Genny prior to commencing works. - All borehole locations will be hand cleared to, where possible 1.5 m bgl (minimum 1.2 m bgl) prior to commencing works. - Only qualified personnel will operate plant. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	1	5	Low
Borehole drilling	Noise	Site staff, visitors, neighbouring residents	4	2	Mod	- PPE – ear protection during percussive sampling and any other noisy activities. - Rig to be turned off when not in use. - Drillers to make those around aware before noisy activities start. - Working hours to be limited to 'office hours' of 8 am to 5 pm. - Site access to visitors and/or members of the public shall be controlled as set out in Rule No. 22 of the Site Rules (Section 4.4).	2	2	Low
Soil sample collection	Contaminant vapours (inhalation)	Site staff	3	4	Mod-High	- Continuous monitoring of contaminant vapour concentrations using Photo-Ionisation Detector (PID). - PPE – half face respirator to be used when deemed necessary. - Atmospheric dilution.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Core liner (cuts)	Site staff	4	3	Mod-High	- PPE – heavy duty gloves. - Care and attention. - Drillers to cut cores. - No Fixed Open Blade Knives to be used.	1	3	Low
	Contaminated water (direct contact)	Site staff	3	4	Mod-High	- PPE – boots, overalls, chemical resistant gloves, eye protection. - Provision of welfare facilities and good hygiene practice. - All contaminated clothing (overalls) to be removed before eating or drinking. - Use of robust and securely closed sample containers, adequately packed for transport. - Care and attention while handling samples.	1	4	Low
Ground-water sample collection	Contaminant vapours (inhalation)	Site staff	3	4	Mod	- Monitoring of contaminant vapour concentrations using Photo-Ionisation Detector (PID), where odours are detected. - PPE – half face respirator to be used when deemed necessary. - Atmospheric dilution.	1	4	Low
	Contact with sampling reagents	Site staff	3	2	Mod	- Use of robust and securely closed sample containers, adequately packed for transport. - Care and attention while handling samples. - PPE – chemical resistant gloves. - Provision of welfare facilities. - All contaminated clothing (overalls) to be removed before eating or drinking.	1	2	Low
Ground-water sample collection	Manual handling	Site staff	3	4	Mod-High	- PPE – steel toe capped boots, overalls, gloves and hard hat - Adequate training, care and attention. - Manual handling risk assessments are presented in Appendix VI.	1	4	Low



Operation	Hazard	Population at Risk	Assessed Risk			Risk Control Measures	Residual Risk		
			L	S	R		L	S	R
	Contaminant vapours (inhalation)	Site staff	2	4	Mod	- Monitoring of contaminant vapour concentrations using Photo-Ionisation Detector (PID). - PPE – half face respirator to be used when deemed necessary. - Atmospheric dilution.	1	4	Low
Ground Reinstatement	Tarmac burns/scalds	Operator	3	3	Mod	- Full PPE and overalls to be worn. No shorts or short sleeves. Rigger gloves to be worn when handling tarmac - When pouring ensure the route is free from any trip hazard	1	3	Low
	Tarmac fumes/odours	Site staff	3	4	High	Natural ventilation will reduce risk but disposable masks should be worn in accordance to COSHH sheet.	1	4	Low
	Unloading/loading equipment	Site staff	2	5	High	- Full PPE to be worn inc rigger gloves - Banksman for unloading roller - Use of flashing light/beacons whilst equipment is moving - Area will be signed and guarded - Two staff are to unload/make the lift of compaction equipment - Equipment must remain within the barriered area at all times during the works and never left unattended.	1	5	Low
	LPG cylinders	Site staff	2	5	Mod	- Do not store near spark or heat source - No smoking - Dry powder fire extinguisher at location	1	4	Low
	Hand Arm Vibration Syndrome (from compaction equipment)	Operative	3	4	High	- Operatives to take regular breaks - Wear Rigger gloves to keep hands warm and maintain circulation - Don't hold equipment too tightly, restore circulation during breaks with hand exercises.	1	4	Low



- NOTE:
- WorleyParsons method statements for the hazardous site operations planned for these site works are presented in Appendix VI. Risk control measures identified in the risk assessment above are incorporated in the method statements.
 - Sub-contractor risk assessments and method statements are presented as Appendix V and checked separately using a sign-off sheet.

4.3 Environmental Aspects and Risk Assessment

WorleyParsons undertakes all work in conformance with our ISO 14001 accredited environmental management system. All works will comply with NGPH environmental management system requirements.

The following table identifies the hazards associated with the environmental aspects of the proposed site work and assesses the risk of environmental harm occurring. Risk control measures are listed and the residual risk assessed. The residual risk must be assessed as Low for the operation to proceed. Environmental aspects are ranked by residual risk.

Operation	Environmental Aspect	Potential Receptor	Assessed Risk			Risk Control Measures	Residual Risk			RANK
			L	S	R		L	S	R	
Site Work (e.g. Trial Pit excavation, Borehole Drilling etc.)	Physical Disturbance	Flora & Fauna	4	4	High	- We are not aware of any protected flora and fauna on-site. - No vegetation will be disturbed. If proposed areas for trial pits or borehole locations are overgrown, the locations will be moved, where possible.	1	2	Low	8=
	Air Emissions	Local Residents / Flora & Fauna	3	4	Mod	- During all site works, efforts should be made to limit dust and vapour generation to a minimum. - Prompt backfilling of trial pits and gas monitoring to minimise vapour and dust release. - Minimise vehicle movement over open ground. - Site Supervisor to monitor dust levels visually. - Monitor vapour generation with PID - At the discretion of a WP representative, water will be sprayed to suppress dust	1	4	Low	1=



Operation	Environmental Aspect	Potential Receptor	Assessed Risk			Risk Control Measures	Residual Risk			RANK
			L	S	R		L	S	R	
	Water Discharges	Principal Aquifer, nearby surface water	2	5	Mod	- Control of water from boreholes. - Spill kits on site. - Emergency response procedure in place (Appendix VII). - Keep sealants away from drains and water courses	1	4	Low	1=
Site Work (e.g. Trial Pit excavation, Borehole Drilling etc.)	Surface water run-off control	Principal Aquifer, nearby surface water	2	5	Mod	- Minimise risk of rainwater contacting contaminated arisings. - Trial pit arisings to be placed on plastic sheeting to prevent contamination of ground surface. - Trial pits to be backfilled as soon as is practicably possible. - Arisings classed as contaminated on a visual / olfactory basis not be replaced at surface. - Excess spoil from drilling works to be disposed of appropriately.	1	5	Low	1=
	Cross contamination between boreholes	Principal Aquifer	3	5	Mod-High	- Drilling gear to be cleaned with jet wash between boreholes at WP representative's discretion. - Washing to be carried out in 'bath' type container. - Washings to be placed in jerry cans and transferred to drums.	1	5	Low	1=



Operation	Environmental Aspect	Potential Receptor	Assessed Risk			Risk Control Measures	Residual Risk			RANK
			L	S	R		L	S	R	
Storage and management of materials	Land Contamination	Site Soils	3	4	Mod-High	- Follow guidelines on correct usage / disposal and labelling of hazardous materials (COSH product data sheets). - Plastic sheeting below soil during excavation. - Excess spoil to be put in covered skips / drums. - Arisings classed as contaminated on a visual / olfactory basis not be replaced at surface. - Washing of drilling gear to be carried out in one designated place only, preferably on an area of hard standing. - Use of robust and securely closed sample containers, adequately packed for transport.	1	4	Low	1=
	Waste Management	Site Soils	2	3	Low	- Minimise waste generation and follow appropriate Waste Management (Duty of Care) Regulations for waste storage / disposal. - Excess spoil to be kept in labelled, covered and locked skips prior to disposal at a licensed facility. - Detailed Method Statement in Appendix VI.	1	3	Low	7
	Hydrocarbon Discharges	Site Soils	2	4	Mod	- Follow refuelling Method Statement provided in Appendix VI. - Use drip trays where appropriate. - If deemed necessary by the site supervisor, fuel cans are to be banded. - Ensure all fuel containers are appropriately labelled and stored. - Spill kits on site. - Emergency response procedures provided in Appendix VII.	1	4	Low	1=



Operation	Environmental Aspect	Potential Receptor	Assessed Risk			Risk Control Measures	Residual Risk			RANK
			L	S	R		L	S	R	
General Site Works	Energy Usage	Global	2	2	Low-Mod	- Plant only to be operated when necessary to reduce diesel use. - Working daylight hours only (where possible) to negate the use of lights and reduce electricity use.	1	2	Low	8=
	Noise	Site tenants	2	2	Low-Mod	- Noise to be kept to a minimum. - Working hours will generally be restricted to 8 am to 5 pm, Monday to Friday.	1	2	Low	8=
	Visual Impact	Site tenants	2	2	Low-Mod	- Works to be completed as soon as possible. - Trial pits to be backfilled on completion and spoil stored in covered skips. - Site left in a state as similar as possible to the way it was found.	1	2	Low	8=
	Transport	Site tenants/ neighbours	2	2	Low-Mod	Where possible, transport movements on and off site will be kept to a minimum.	1	2	Low	8=
	Ecology	Local Fauna & Flora	3	2	Mod	Impacts of work to be minimised by identifying any wildlife in the vicinity of the works which could be affected and then planning site operations accordingly.	1	2	Low	8=



5. ARRANGEMENTS FOR CONTROLLING SIGNIFICANT SITE RISKS

General hazards associated with the site investigation work have been identified and a Risk Assessment is presented in Section 4.2. Method Statements for potentially hazardous operations are presented in Appendix IV and VI. The general measures that will be employed to mitigate identified risks are presented below.

5.1 Compliance with Health and Safety Requirements of the Client

5.2 Safety Risks

5.2.1 Working Hours and Driving

The site works programme will be developed to take into account the travel time required, as well as the total site hours. Excessive total hours per day will be avoided by reducing the site time if a long journey is required the same day, and by staying locally to avoid long daily journey times.

5.2.2 Boundaries and Site Access

Access to the site has been arranged with the client, NGPH & WWU. Section 2 of this HSSE Plan contains further details concerning site boundaries and access.

Access to the work area will be controlled as required by CDM 2007 and in accordance with the level of risk posed. The following will be considered as a minimum:

- The gate will be kept locked at all times.
- Suitable signs will be used to identify the work area.
- Fencing / barriers / tape will be used to mark the extent of the work area.

Vehicle access will be by a designated entrance. The size of vehicles accessing the site will be kept to a minimum. A marked parking area will be designated. The entry and exit of large vehicles will be planned and controlled by a banksman (as appropriate).

5.2.3 Delivery or collection of plant / materials / equipment from site

Delivery or collection of large or heavy objects may be required and lifting or manual handling hazards may be present. In all cases a RA/MS will be requested from the supplier and checked. If not available a JSA form will be used to plan the task. A designated banksman will be used to guide lifting operations. A safe means of access will be used to work at height to fix lifting chains, etc. Mechanical assistance should be used to facilitate manual handling tasks wherever possible, and appropriate hand protection must be used.

5.2.4 Lone Working

Lone working will only take place when a detailed risk assessment has been carried out and the risks are acceptable. In general, site work will be carried out by two or more people. However, 'lone working' risks can arise even when more than one person is present on site. For example, if



one person arrives first or leaves last, there will be a period when lone working is taking place. This will not be allowed, unless the risk is assessed and documented, and full check-in arrangements made and followed.

Separation of personnel on a large site can also introduce or increase the risks associated with 'lone working'. Any risks of this type will be assessed and documented, taking account of proximity to areas where public access is possible, site security, any history of aggressive behaviour or vandalism associated with the site. The following rules will be followed when appropriate:

- When working >50 m from other site users in higher risk areas there will be a minimum of two people at all times;
- If working away from other site staff, a phone call is required every 15 mins to the Site Supervisor.

If there are any doubts about the safety of working alone then the situation will be reassessed and working arrangements will be altered accordingly.

5.2.5 Use of PPE

Personal Protective Equipment will be used by all site staff and visitors as specified in the general Site Rules (Section 3.4) and detailed in the Risk Assessment for specific tasks (Section 4.2).

PPE will be used in the correct way, maintained in a good condition, stored correctly and replaced when required. Specific guidelines for use of PPE are:

- | | |
|----------------|---|
| Hardhats | - should be checked to be in good condition and within their expiry date. |
| | - if conditions are very hot, then any sun protection (e.g. cloth covering neck) must not compromise the protection afforded by the secure fit of the hard hat. |
| Safety glasses | - if safety glasses become uncomfortable and have to be removed (e.g. due to sweat), then the individual must temporarily halt the task or move away from the hazard area as appropriate. |
| Hi-Vis jackets | - should be close fitting and fastened at all times, to avoid the risk of getting caught in any moving equipment. |

5.2.6 Location of Existing Services

A Ground Disturbance checklist is included in Appendix I, detailing the procedure to be followed before commencing any work that penetrates the ground surface.

All available details of underground services available prior to works commencing are included in Appendix I.

A comprehensive service location by an approved supplier will be undertaken as part of the Ground Disturbance procedure, before any ground penetration is allowed.

Services which may be affected by the proposed excavation works will be recorded by marking with paint or by the placement of stakes (when paint used the marks must last clearly for the duration of the works). Where considered necessary, services will be exposed by vacuum excavation or hand digging.

All unexpected services encountered will be reported to NGPH COMPASS as a near miss.



5.2.7 Trial Pit Excavation and Borehole Drilling

A Permit to Work (Ground Penetration) system will be operated. Sign off of the permit will be required before commencing any work that breaks the ground surface.

Method Statements for the procedures to be followed during the operation of excavators and drilling rigs to construct trial pits and boreholes are provided in Appendix VI. A trained banksman, or WorleyParsons representative with appropriate training, will observe the operation of mechanical excavators at all times (see Section 5.2.13 below).

All work will be carried out in accordance with the HSE guidance document HSG47 'Avoiding danger from underground services' (HSE, 2001).

5.2.8 Unexploded Ordnance

An assessment of the potential for unexploded ordnance (UXO) to exist on site was undertaken in February 2011. The report concluded that no specific UXO risk assessment is required though recommended that all site staff are made aware of the site history and the potential for UXO to exist during the site induction.

5.2.9 Plant and Equipment – Maintenance and Condition

All contractors will be required to provide documentation proving that their plant and equipment is in good operating condition. A sign-off by the lead sub-contractor staff, indicating that plant has been checked and is in a serviceable condition, is required on the enclosed Subcontractor Equipment Inspection Form before work commences each week.

Documentary evidence of operator competence will be checked and recorded before work commences.

5.2.10 Ground Conditions

All contractors will be required to provide a good level of housekeeping in order to keep obstructions on site to a minimum. This will include making sure that arisings from any excavations are moved away from work areas as appropriate. However, sites often have rough/uneven ground surfaces and therefore care should be taken by site personnel at all times to avoid slips, trips and falls.

5.2.11 Dealing With Existing Unstable Structures

There are no existing unstable structures in the vicinity of the proposed excavation works. Prior to entering buildings to collect indoor air quality samples a visual inspection of the building will be undertaken.

5.2.12 Accommodating Adjacent Land Use

All reasonable measures will be undertaken to accommodate adjacent land use while conducting works on the site. Section 3 of this HSSE Plan provides a more detailed description of the adjacent land uses and Section 5 lists the accommodating measures to be undertaken.



5.2.13 Vehicle & Plant Movements and Operation

Only designated operators with adequate and verified experience and training will operate plant and other vehicles on site.

Vehicle movement on site is to be minimised. When moving vehicles & plant attention should be given to ensuring that routes are suitable for movement of a particular vehicle. A designated banksman shall accompany any excavator, drill rig or service vehicle when it moves around site to ensure, amongst other things, that other site workers are clear of the vehicle as it moves. The banksman will:

- be adequately trained and assessed as competent;
- use a clear system of signalling, agreed with the driver before starting;
- discuss the proposed operation and possible hazards with the driver before starting;
- be visible to drivers at all times;
- **stand in a safe position** where moving plant/vehicle can be guided without being in its way;
- wear highly visible clothing, such as reflective or fluorescent vests, and make sure that any signals are clearly seen.

Working areas will be demarcated with barriers where necessary to ensure site traffic is separated from work areas by a suitable safe margin.

Any hazards of restricted space and nearby obstructions will be assessed and discussed using a toolbox talk before individual plant operations.

5.2.14 Other Safety Risks

The Risk Assessment provided in Section 4 of this Plan provides details of other identified safety risks associated with the proposed works.

5.3 Health Risks

5.3.1 Manual Handling

A Risk Assessment for general physical activities that may be required during the works is included in Section 4 of this HSSE Plan.

5.3.2 Contaminated Land

It is expected that contaminated land will be encountered. COSHH assessments for materials that may be encountered at a typical contaminated gasworks site are included as Appendix II. A Method Statement describing the procedures that will be followed when dealing with contaminated material is provided in Appendix VI.

Use robust and securely closed sample containers, adequately packed for transport, plus care and attention while handling samples to reduce the risk of spillage.

Sections 2 and 4 of this HSSE Plan contain additional site-specific information.



5.3.3 Asbestos

Appendix II contains a COSHH assessment and Appendix VI contains the Method Statement for situations where asbestos is encountered.

5.3.4 Handling and Storage of Hazardous Materials

A lockable container will be used on site to provide secure storage of all materials required during the site works. All fuel and other oil products will be stored and used in accordance with COSHH regulations and with reference to relevant Material Safety Data Sheets (MSDS). A designated area is defined for refuelling activities, where possible located on hard standing and away from surface drainage points. Drip trays will be used for all refuelling operations. Spill kits will be made available on site.

A designated area is defined for storage of waste materials (adjacent to the site entrance), on hard standing away from surface drainage points. Waste materials will be separated for recycling where reasonably practicable and in accordance with recognised best practice. Solid non-hazardous waste will be stored in a covered lockable steel skip (with no holes) for offsite disposal. Potentially hazardous solid waste materials will be stored in steel drums with lockable lid for appropriate testing and offsite disposal. Potentially hazardous liquid waste will be stored in steel drums with lockable correctly fitting lids within a bunded area for appropriate testing and offsite disposal.

All waste will be handled, stored and disposed of with due regard to COSHH and waste producers Duty of Care regulations. Appropriate hazard warning labels will be affixed to all waste containers and appropriate signage will be erected in the waste storage area.

See the WP Method Statement: Material/Waste Handling During Site Investigations (Appendix VI).

5.3.5 Air Emissions

Above ground service clearance and hand digging to prove the location of services will be undertaken to prevent damage to gas mains and thus avoid release of gas. Prompt backfilling of trial pits and gas monitoring will help to minimise vapour release.

5.3.6 Reducing Noise

Where possible noise on site will be minimised. Working hours will generally be restricted to 8am to 5pm, Monday to Friday.

6. WELFARE FACILITIES

Provision of welfare facilities shall be in accordance with Construction (Design & Management) Regulations 2007. A designated area will be available for eating and drinking. A welfare unit, with a flushable toilet, hot and cold water and electrical supply will be available on site.

Welfare arrangements will be discussed at the safety training induction.



7. EMERGENCY PROCEDURES

The person in charge is the Site Supervisor. In the event of an incident on site, the Site Supervisor must be called to the scene immediately. A first aid box will be available on site, located near to site operations. An Emergency Response summary sheet is provide at the front of this plan, which can be removed and posted for reference as appropriate.

7.1 General Emergency Procedure

A series of Emergency Response Procedures have been developed to provide guidance for the methods of dealing with unplanned events that could threaten the health and safety of site operatives and the general public, as well as the environment. These Procedures are provided in Appendix VII. However, in general, the following procedure should be followed:

1. Ensure your own safety.
2. Raise the alarm (fire alarm, vehicle horn, shout etc.).
3. Assess the situation.
4. Make the area safe. Remove injured persons from the danger area if safe to do so.
5. Shut down equipment (being used as part of the works and covered by this plan).
6. Act as required and as competent, without exposing yourself to unacceptable risks (extinguish fire, contain spill, render first aid etc.). See Appendix VII.
7. Telephone for emergency assistance (fire service, paramedics) if necessary.

In the event of an emergency, the team member that observes this condition should give an emergency alarm (fire alarm, vehicle horn, shout etc.). All unnecessary communications should cease and the person giving the alarm should notify the Site Supervisor. Actions to be taken will be dictated by the emergency. Any injured personnel should be taken to the designated local medical facility and all uninjured personnel should remain in a safe area.

Information on the nature of the site and any contamination likely to have affected the injured person(s) should be given to Doctors, Paramedics etc.

7.2 Procedure for Contacting Emergency Services

When calling for assistance in an emergency situation, the following information should be provided:

- Name of person making call;
- Telephone number and location of person making call;
- Name of person(s) exposed or injured and location;
- Nature of emergency and type of exposure, when appropriate; and
- Actions already taken.

Never hang up first when calling for emergency assistance. Wait for the operator to finish all questions.



7.3 Emergency Contacts

Fire, Police, Ambulance		999
Gas	National Gas Emergency Number (Gas leaks only)	0800 111 999
Electricity	SP power systems (Manweb)	0845 272 2424
Sewerage	Welsh Water	0800 052 0130
Water	Dee Valley Water	01978 846 946
Environment Agency	Emergency Number	0800 807060
National Grid	IMS Incident Line	0800 777770
CDM Coordinator	Ken Buchanan	077 0177 60121
JBP		0117 907 3400
WorleyParsons	Project Manager: Natasha Glynn	0117 910 5123
	Project Director: Adrian Shields	07500 868 622
	HSSE Advisor: Tim Bartlett	07968 807 496

7.4 Reporting

The Site Supervisor must inform the Project Manager by phone as soon as any incident is under control. If the Project Manager is not available, the Project Director or other senior member of WorleyParsons staff should be contacted. The Project Manager will inform the client National Grid Property Holdings Regeneration Manager of the incident at the earliest opportunity. The Project Manager will liaise with the appointed National Grid Property Holdings PR Company, as necessary.

All incidents and near misses will be reported to the WorleyParsons Hotline, and to the client through the National Grid IMS procedure. All unexpected services encountered will be reported to NGPH IMS as a near miss.

Any RIDDOR reporting requirements will be the responsibility of the WorleyParsons HSSE Advisor, in the company's role as Principal Contractor.



7.5 Route to Accident & Emergency Hospital

The nearest hospital with Accident and Emergency facilities is:

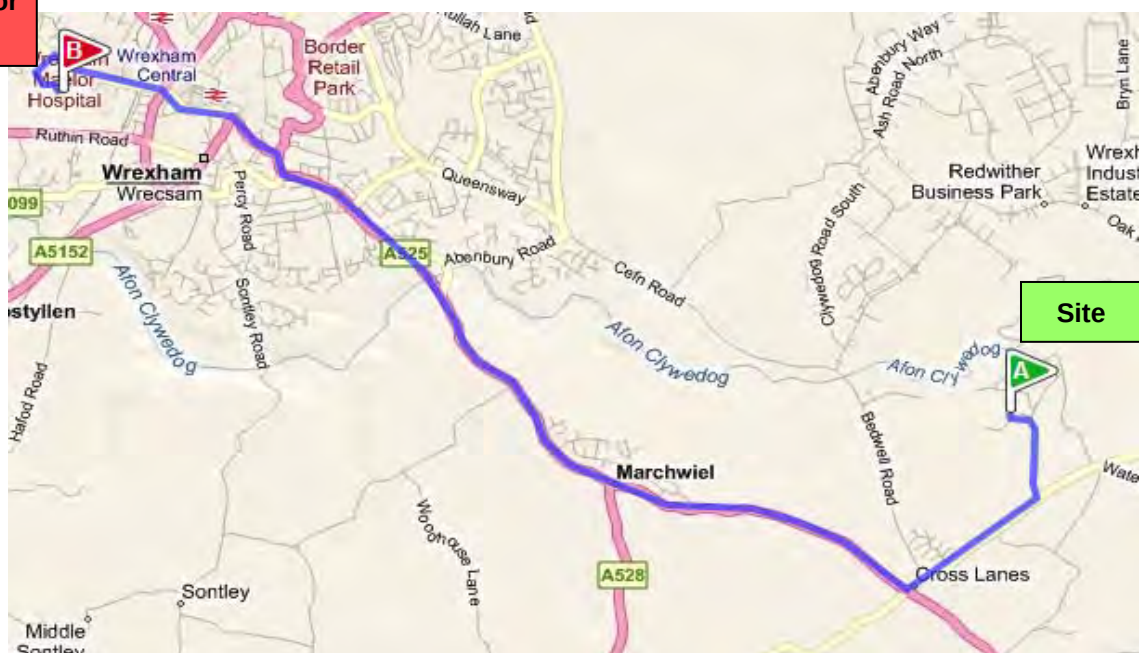
Wrexham Maelor Hospital Croesnewydd Road Wrexham LL13 7TD	Telephone: 01978 291100
---	--------------------------------

Route from site:

- Depart from LL13 0UW, * Private Road
- Turn right onto B5130
- Bear right onto A525
- Turn left onto Rhodfa San Silwyn / St Giles Way
- Road name changes to Brook Street
- Road name changes to Pentrefelin
- At roundabout, take 2nd exit onto Watery Road
- Road name changes to Croesnewydd Road
- Turn left onto road
- Arrive at LL13 7TD, Wrexham on the left The last intersection is Croesnewydd Road

The hospital location and route from the site are shown on the map below:

**Wrexham Maelor
Hospital**





WorleyParsons

resources & energy

NATIONAL GRID PROPERTY HOLDINGS LTD.

SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

Appendix I

Ground Disturbance Arrangements (Including Service Plans)



Locator Company:	Service Location Uk Ltd	Project Number:	50065-29
Attention:	Rob Asquith	From:	Natasha Glynn
Fax Number:		Mobile:	

DETAILS

Site Location: Maelor Works, Wrexham

Client: NGPH & WWU

Date and Type of Planned Ground Disturbance:

Service Location Date & Time: TBC

Meeting Location: TBC

Service Location Methods/Equipment Requested:

As required

Required PPE: ☒ Hard hat ☒ Coveralls ☒ Steel-Toed Boots ☐ Respirator/Half Mask
☒ Safety Glasses ☐ Hearing Protection ☒ Gloves ☐ Other:

SCOPE OF WORK	Complete	Locator Initials
1. Reference and have available on-site all available historical locates previously conducted.	☒	
2. Blind sweep the search area (30 m all sides of work area) in four separate 'grid patterns' (i.e. N/S, E/W and angular in both directions).	☒	
3. Conduct a circular sweep around the proposed ground disturbance point (if the point is specified).	☒	
4. Utilize the international colour code system (as appropriate) to mark facilities and perimeters; marking: - All underground utilities and right of ways within the search area; - The perimeter of the search area.	☒ ☒	
5. Provide a plot plan (attached), indicating all above ground and underground services that were located, proposed locations of work, search area (including dimensions) and major site features. Also include site location, date of service tracing and sign the plans. Use an appropriate scale and use the international colour code system to indicate services.	☒	
6. Discuss any potential interference affecting the reliability of location with WorleyParsons representative (e.g. congestion, obstructions, weather).	☒	
7. Discuss any discrepancies between location maps with the WorleyParsons representative on-site.	☒	

Describe any deviations (i.e. any incomplete items) from the above scope of work in the space below:

Have indicated some locations are not to be moved.
 Site services & locations in blue.

VERIFICATION

Sign below to indicate that you have completed this request according to the scope outlined above and discussed results with the WorleyParsons representative.

Service Locator (print and sign):

T. COLES

Date: 12/5/11

WorleyParsons Rep (print and sign):

ALAN SMITH

Date: 12/05/11



Project Number: 50065-29	Project Name: Maelor Site INvestigation
Client: NGPH	Location: Maelor, Wrexham
Project Description: Vacuum excavation of boreholes and trial pits before drilling and full trial pit excavation. (as it pertains to ground disturbance)	

ITEM (check off in order)	Yes	No	N/A	Site Supervisor
STEP 1: BACKGROUND/NOTIFICATION				
1. Have all utility owners (utility provider, plant protection, etc.) in the area been notified of the proposed works and supplied plans of their local services? → Is the GROUND DISTURBANCE NOTIFICATION RECORD complete?	✓			AS
2. Have all utility owner specific requirements (e.g. presence of company rep, key distances, etc.) been checked and agreed?	✓			DS
3. Have all available records been referenced and contacts been made to determine existence / location of services in the search area (minimum WorleyParsons files, client files, land titles/OS map search)?	✓			DS
4. Has a WorleyParsons HSSE Plan, including service location plans and contractor method statements and risk assessments been prepared and approved?	✓			DS
5. Has an initial composite site plan been compiled showing proposed locations, search area, known above ground and underground services, major site features, date of any previous service locates?	✓			AS
CRITICAL CHECKPOINT 1 (Do not proceed to Step 2 without review and approval)	Project Manager:			
STEP 2: SERVICE LOCATE				
6. Has service location been conducted? → Is the SERVICE LOCATE REQUEST complete?	Y NG			AS
7. Have all services within 30 metres of the ground disturbance location been located, location and alignment marked, and reconciled with previous info?		✓		DS
8. Have all on-site gas, electricity, water mains and fibre optic services within a 15 meter radius of the ground disturbance(s) been positively identified, e.g. <u>positive CAT/Genny signal</u> , manholes, hand-exposed or <u>vacuum excavation</u> ? (Notes: Site owner must be contacted for exposure and inspection; GROUND DISTURBANCE PERMIT required for any excavation works).	✓			DS
CRITICAL CHECKPOINT 2 (Do not proceed to Step 3 without review and approval)	Project Manager:			
STEP 3: FINALISE				
9. Has a FINAL composite site plan been prepared showing major site features, proposed work areas, date of service location, all services within the search area highlighted, overhead lines noted, and routes of travel for plant marked where appropriate?	✓			DS
10. Are all ground disturbance locations the required distance away from underground services as required by utility providers? If not, have the utility providers been notified of the proposed ground disturbance work within close vicinity to their service?	✓			DS
11. Will a pre-job field safety meeting (Tool Box Talk) be held & documented to cover Ground Disturbance activities on site?	✓			DS
12. Has a GROUND DISTURBANCE PERMIT been prepared?				
CRITICAL CHECKPOINT 3 (Do not commence main ground disturbance works without approval)	Project Manager:			

but using VAC ET to prove



Project Number: 50065-29	Project Name: Maelor S.I
Client: NGPL Ltd	Location: Maelor works, Wrexham
Project Description: Reinstatement of 4 trial pits with tarmac after excavation of backfill material to 450mm bgl. (as it pertains to ground disturbance)	

ITEM (check off in order)	Yes	No	N/A	Site Supervisor
STEP 1: BACKGROUND/NOTIFICATION				
1. Have all utility owners (utility provider, plant protection, etc.) in the area been notified of the proposed works and supplied plans of their local services? → Is the GROUND DISTURBANCE NOTIFICATION RECORD complete?	✓			B
2. Have all utility owner specific requirements (e.g. presence of company rep, key distances, etc.) been checked and agreed?	✓			B
3. Have all available records been referenced and contacts been made to determine existence / location of services in the search area (minimum WorleyParsons files, client files, land titles/OS map search)?	✓			B
4. Has a WorleyParsons HSSE Plan, including service location plans and contractor method statements and risk assessments been prepared and approved?	✓			B
5. Has an initial composite site plan been compiled showing proposed locations, search area, known above ground and underground services, major site features, date of any previous service locates?	✓			B
CRITICAL CHECKPOINT 1 (Do not proceed to Step 2 without review and approval)	Project Manager:			
STEP 2: SERVICE LOCATE				
6. Has service location been conducted? → Is the SERVICE LOCATE REQUEST complete?	✓			B
7. Have all services within 30 metres of the ground disturbance location been located, location and alignment marked, and reconciled with previous info?	✓			B
8. Have all on-site gas, electricity, water mains and fibre optic services within a 15 meter radius of the ground disturbance(s) been positively identified, e.g. positive CAT/Genny signal, manholes, hand-exposed or vacuum excavation? (Notes: Site owner must be contacted for exposure and inspection; GROUND DISTURBANCE PERMIT required for any excavation works).	✓			B
CRITICAL CHECKPOINT 2 (Do not proceed to Step 3 without review and approval)	Project Manager:			
STEP 3: FINALISE				
9. Has a FINAL composite site plan been prepared showing major site features, proposed work areas, date of service location, all services within the search area highlighted, overhead lines noted, and routes of travel for plant marked where appropriate?	✓			B
10. Are all ground disturbance locations the required distance away from underground services as required by utility providers? If not, have the utility providers been notified of the proposed ground disturbance work within close vicinity to their service?	✓			B
11. Will a pre-job field safety meeting (Tool Box Talk) be held & documented to cover Ground Disturbance activities on site?	✓			B
12. Has a GROUND DISTURBANCE PERMIT been prepared?	✓			B
CRITICAL CHECKPOINT 3 (Do not commence main ground disturbance works without approval)	Project Manager:			B

**Part A – Job Details**

Project Number: 50065-29	Date: 31 st May 2011	Permit Valid From:
Client: NGPH	Location: Maelor, Wrexham	Permit Valid To:
Name of Site Supervisor: Alan R Smith		
Name of Company performing ground disturbance work: OSDS and CC Ground Investigations		
General description of work to be undertaken and reason for excavation: OSDS will positively prove services where required and excavate trial holes to 1.5 m depth at all 14 borehole locations and 14 trial pit locations. CC Ground Investigations will then drill boreholes to approximately 4 – 6 m bgl and excavate trial pits to approximately 4 m bgl.		
See table overleaf for list of location-specific reasons / justifications.		

Part B – General Ground Disturbance Hazards Identified and Assessed

- ☒ Unstable ground conditions ☐ Deep excavations (working from height) ☒ Open Excavations ☒ Slips/trips
☒ Hazardous material (asbestos) ☒ Sharps (made ground) ☒ Soil/water contamination ☒ Ground gas/volatiles ☒ UXO's
☐ Hot work (a separate permit will be required) ☒ Hand tools (concrete cutter/corer, etc) ☒ Manual Handling ☒ Dust
☐ Other (specify):

See table overleaf for list of location-specific hazards.

Part C – General Ground Disturbance Work Controls to be Implemented

- ☐ Ground Disturbance Checklist completed ☐ Utility plans available on site ☐ HSSE Plan completed and approved
☐ Method statements/risk assessments completed and available on site ☐ Emergency Response Plan communicated
☐ Emergency contact numbers available ☐ CAT and Genny available on site ☐ Warning signs/fencing/barriers
☐ Exclusion zone set up ☐ Gas monitoring/personal gas monitors ☐ PPE (refer to risk assessment/method statements)
☐ Banksman ☐ Dampening down ☐ Other:

See table overleaf for list of location-specific work controls.

Part D – Permit Issue and Acceptance

Permit Authoriser			
Name	Signature	Date	'Authorization is given to commence work under the conditions prescribed on this Permit.'
Permit Issuer (e.g. Site Supervisor)			
Name	Signature	Date	'I confirm that all controls have been checked and communicated and that the pre-conditions are met. Work specified on this Permit may proceed subject to the Work Party adhering to all pre-conditions and are aware of all safety precautions associated with the job.'
Alan Smith			
Permit Holder (Person Undertaking Work)			
Name	Signature	Date	'I have been shown/understand all controls and I understand and accept the conditions and precautions detailed above. I shall ensure that all personnel involved in the work described are informed of them.'

Part E – Permit Handback and Closure

Permit Issuer (e.g. Site Supervisor)			
Name	Signature	Date	'I confirm that all work for which this Permit was issued has been completed, the area backfilled, barriers removed, and the workplace has been inspected and is in a clean and safe condition.'

GROUND DISTURBANCE PERMIT FORM

Project Number: 50065-29

Location: Maelor Works, Wrexham

Date:

LOCATION SPECIFIC DETAILS

LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use <i>n/a</i> as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
MW11-01	Monitoring well to target any contamination beneath former gasholder base. Also will provide groundwater data on up gradient site boundary and assessment of groundwater flow direction.	None	NO		Yes – vac ex or hand pit to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-02	Monitoring well to target any contamination beneath former purifiers.	1. Gas- NOT shown on most recent service plans	YES- Vac Ex		Yes – vac ex to 1.5 m	Percussion drilling	Yes Move 3 m away from main if located	n/a	n/a
MW11-03 FOUND	Replacement for MW99-103 (if this MW is not found)	None	NO		Yes – vac ex to 1.5 m	NOT DRILLING	No	n/a	n/a
MW11-04	Monitoring well is set down hydraulic gradient of a former Benzol plant.	1. Possible electric	Yes Vac Ex		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-05	Replacement for MW99-205 (if this MW is not found)	1. Possible electric 2. Drainage 3. Gas (move 10 m away)	YES- Not picked up by service trace		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-06 FOUND	Replacement for MW99-110 (if this MW is not found)	None	NO		Yes – vac ex to 1.5 m	NOT DRILLING	No	n/a	n/a
MW11-07	Monitoring well to target former tar separator tanks and condensers	1. Medium pressure gas- move 3 m away	YES- vac ex		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a

GROUND DISTURBANCE PERMIT FORM

Project Number: 50065-29

Location: Maelor Works, Wrexham

Date:

LOCATION SPECIFIC DETAILS

LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
MW11-08	Monitoring well to target CWG plant	1. Low pressure gas 2. 2 x electric	YES- vac ex		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-09 Just Starter pit	Monitoring well to increase environmental data coverage.	1. Sewer 2. Drainage	Possibly IF picked up on CAT and Genny		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-10	Monitoring well to target former eastern Liquid Distillate Feedstock storage tanks. And to increase environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-11	Monitoring well to target former Retort House. And to increase environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-12	Monitoring well to target former southern Oil Gas Plant.	1. Electric 2. Low pressure gas 3. Foul sewer 4. Unknown signal with CAT and Genny	Vac Ex		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-13	Monitoring well to target former Coke and Coal storage area.	NONE- Keep away from electric	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-14	Replacement for MW99-202 (if this MW is not found)	NONE- Keep 9 m away from overhead electric	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a

GROUND DISTURBANCE PERMIT FORM

Project Number: 50065-29

Location: Maelor Works, Wrexham

Date:

LOCATION-SPECIFIC DETAILS

LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
MW11-16	Monitoring well will provide groundwater data on up gradient site boundary and assessment of groundwater flow direction.	NONE	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a

TP11-01	Trial Pit to target former northern Oil Gas Plant.	1. Foul Sewer 2. Water main	Vac Ex		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			
TP11-02	Trial Pit to target former northern Concentrated Liquor Plant.	NONE	NA		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			
TP11-03	Trial Pit to target Effluent tar and liquor tanks with detarrer and scrubbers and cooling tower	1. Sewer 2. Drainage 3. Electric	Vac Ex		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			

TP11-05	Trial Pit in vicinity of former Retort House	NONE	NA		Yes – vac ex to 1.5 m	Mechanica l excavator			
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GROUND DISTURBANCE PERMIT FORM

Project Number: 50065-29

Location: Maelor Works, Wrexham

Date:

LOCATION SPECIFIC DETAILS

LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
						>1.5 m			
TP11-06	Trial Pit in vicinity of former Coke Grading Plant	1. Electricity 2. Sewer/Drainage	Yes- Vac Ex		Yes – vac ex to 1.5 m	Mechanical excavator >1.5 m			
TP11-07	Trial Pit to target former western Liquid Distillate Feedstock storage tanks. And to increase environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Mechanical excavator >1.5 m			
TP11-08	Trial Pit in vicinity of former Settling Tanks	NONE	NA		Yes – vac ex to 1.5 m	Mechanical excavator >1.5 m			
TP11-09 DO NOT DO	Trial Pit to increase environmental data coverage.	1 Water Main			Yes – vac ex to 1.5 m	NOT EXCAVATING			
TP11-10	Trial Pit to increase environmental data coverage.	1. Electricity- picked up with CAT			Yes – vac ex to 1.5 m	Mechanical excavator >1.5 m			

GROUND DISTURBANCE PERMIT FORM

Project Number: 50065-29	Location: Maelor Works, Wrexham	Date:
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LOCATION-SPECIFIC DETAILS									
LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES <i>(fill in all columns to record decisions – use n/a as required)</i>						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
TP11-14	Trial Pit to target former stores and environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			

HAZARD PROMPT LIST for specific ground disturbance locations (NOT exhaustive):

- Underground services
- Parallel or crossing services
- Overground/overhead services
- ANY OTHERS?
- Limited laydown areas for material stockpiling
- Unstable ground conditions
- Potentially unstable slopes
- Adjacent to buildings or other above ground structures
- Limited access/egress to work area
- Site plan / traffic movements



Part A – Job Details

Project Number: 50065-29	Date: 06/05/2011	Permit Valid From: 23/05/2011
Client: NGPH	Location: Maelor, Wrexham	Permit Valid To: 10/06/2011

Name of Site Supervisor: Alan R Smith

Name of Company performing ground disturbance work: OSDS and CC Ground Investigations

General description of work to be undertaken and reason for excavation: OSDS will positively prove services where required and excavate trial holes to 1.5 m depth at all 18 borehole locations and 14 trial pit locations. CC Ground Investigations will then drill boreholes to approximately 4 – 6 m bgl and excavate trial pits to approximately 4 m bgl.

See table overleaf for list of location-specific reasons / justifications.

Part B – General Ground Disturbance Hazards Identified and Assessed

- ☒ Unstable ground conditions ☐ Deep excavations (working from height) ☒ Open Excavations ☒ Slips/trips
☒ Hazardous material (asbestos) ☒ Sharps (made ground) ☒ Soil/water contamination ☒ Ground gas/volatiles ☒ UXO's
☐ Hot work (a separate permit will be required) ☒ Hand tools (concrete cutter/corer, etc) ☒ Manual Handling ☒ Dust
☐ Other (specify):

See table overleaf for list of location-specific hazards.

Part C – General Ground Disturbance Work Controls to be Implemented

- ☒ Ground Disturbance Checklist completed ☒ Utility plans available on site ☒ HSE Plan completed and approved
☒ Method statements/risk assessments completed and available on site ☐ Emergency Response Plan communicated
☒ Emergency contact numbers available ☒ CAT and Genny available on site ☐ Warning signs/fencing/barriers
☒ Exclusion zone set up ☒ Gas monitoring/personal gas monitors ☒ PPE (refer to risk assessment/method statements)
☒ Banksman ☐ Dampening down ☐ Other:

See table overleaf for list of location-specific work controls.

Part D – Permit Issue and Acceptance

Permit Authoriser OSDS			
Name NATASHA GLYNW	Signature OS PP	Date 16/5/11	'Authorization is given to commence work under the conditions prescribed on this Permit.'

Permit Issuer (e.g. Site Supervisor)

Name Alan Smith	Signature Alan Smith	Date 16/5/11	'I confirm that all controls have been checked and communicated and that the pre-conditions are met. Work specified on this Permit may proceed subject to the Work Party adhering to all pre-conditions and are aware of all safety precautions associated with the job.'
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Permit Holder (Person Undertaking Work)

Name Daniel Murray	Signature D Murray	Date 17/5/11	'I have been shown/understand all controls and I understand and accept the conditions and precautions detailed above. I shall ensure that all personnel involved in the work described are informed of them.'
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Part E – Permit Handback and Closure

Permit Issuer (e.g. Site Supervisor)

Name Daniel Murray	Signature D Murray	Date 27/5/11	'I confirm that all work for which this Permit was issued has been completed, the area backfilled, barriers removed, and the workplace has been inspected and is in a clean and safe condition.'
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GROUND DISTURBANCE PERMIT FORM

Project Number:	Location:	Date:
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LOCATION-SPECIFIC DETAILS									
LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in all columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/Benching/Shoring	Other (specify)
MW11-01	Monitoring well to target any contamination beneath former gasholder base. Also will provide groundwater data on up gradient site boundary and assessment of groundwater flow direction.	None	NO		Yes – vac ex to 1.5 m or hand dug pit.	Percussion drilling	No	n/a	n/a
MW11-02	Monitoring well to target any contamination beneath former purifiers.	1. Gas – not shown on most recent service plans.	YES- Vac Ex	—	Yes – vac ex to 1.5 m	Percussion drilling	No + move 3m away from main if located.	n/a	n/a
MW11-03	Replacement for MW99-103 (if this MW is not found)	None Service trace picked up Signal. Electric / water + gas to South of location.	NO YES- Vac Ex	—	Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-04	Monitoring well is set down hydraulic gradient of a former Benzol plant.	1. Possible electric	NO YES- Vac Ex	—	Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-05	Replacement for MW99-205 (if this MW is not found)	1. Possible electric 2. Drainage 3. Gas Probe vac Ex make location so 10 m away	YES- Vac Ex IF detected in proximity to the proposed location		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-06	Replacement for MW99-110 (if this MW is not found)	None Well found so no need to drill	NO		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a

gas may not be picked up by service trace.

GROUND DISTURBANCE PERMIT FORM

Project Number:	Location:	Date:
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LOCATION-SPECIFIC DETAILS

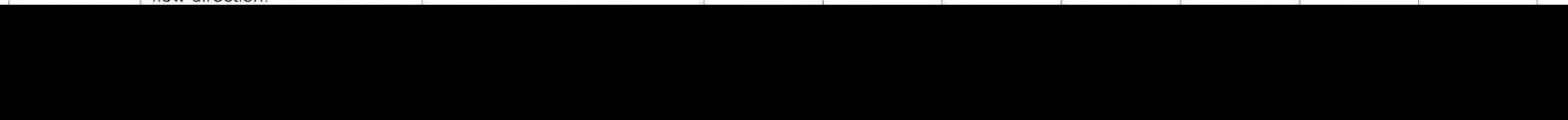
LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
MW11-07	Monitoring well to target former tar separator tanks and condensers	1. Medium pressure gas <i>- Prove to keep 3m away</i>	YES- vac ex		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-08	Monitoring well to target CWG plant and oil tank	1. Low pressure gas XZ <i>+ Electricity</i>	YES- vac ex	—	Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-09 <i>Just Starter pit.</i>	Monitoring well to increase environmental data coverage.	1. Sewer 2. Drainage <i>hatched at</i> <i>possibly if broken up on CAT and Genny</i>	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-10	Monitoring well to target former eastern Liquid Distillate Feedstock storage tanks. And to increase environmental data coverage.	NONE <i>Shore as side plan</i>	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-11	Monitoring well to target former Retort House. And to increase environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-12	Monitoring well to target former southern Oil Gas Plant.	NONE Electric Low pressure gas Foul Sewer + Signal <i>Unknown Signal with CAT & Genny.</i>	NA VAC EX	—	Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-13	Monitoring well to target former Coke and Coal storage area.	NONE <i>- Keep 15m away from electric.</i>	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a
MW11-14	Replacement for MW99-202 (if this MW is not found)	NONE <i>- keep 9m away from overhead electric.</i>	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a

GROUND DISTURBANCE PERMIT FORM

Project Number:	Location:	Date:
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LOCATION-SPECIFIC DETAILS

LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in <i>all</i> columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
	environmental data coverage.				ex to 1.5 m	drilling			
MW11-16	Monitoring well will provide groundwater data on up gradient site boundary and assessment of groundwater flow direction.	NONE <i>Pass eco issues as needed.</i>	NA		Yes – vac ex to 1.5 m	Percussion drilling	No	n/a	n/a



TP11-01	Trial Pit to target former northern Oil Gas Plant.	1. Foul Sewer 2. Water main	NO Vac EX		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			
TP11-02	Trial Pit to target former northern Concentrated Liquor Plant.	NONE	NA		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			
TP11-03	Trial Pit to target Effluent tar and liquor tanks with detarrer and scrubbers and cooling tower	1. Sewer 2. Drainage 3. <i>electrical</i>	NO VAC EX		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			



TP11-05	Trial Pit in vicinity of former Retort House	NONE	NA		Yes – vac ex to 1.5 m	Mechanica l excavator >1.5 m			
TP11-06	Trial Pit in vicinity of former	1. Electricity	Yes- Vac		Yes – vac	Mechanica			

GROUND DISTURBANCE PERMIT FORM

Project Number:	Location:	Date:
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LOCATION-SPECIFIC DETAILS									
LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES (fill in all columns to record decisions – use n/a as required)						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
	Coke Grading Plant	2. Sewer/Drainage	Ex		ex to 1.5 m	1 excavator >1.5 m			
TP11-07	Trial Pit to target former western Liquid Distillate Feedstock storage tanks. And to increase environmental data coverage.	NONE	NA		Yes – vac ex to 1.5 m	Mechanica 1 excavator >1.5 m			
TP11-08	Trial Pit in vicinity of former Settling Tanks	NONE	NA		Yes – vac ex to 1.5 m	Mechanica 1 excavator >1.5 m			
TP11-09	Trial Pit to increase environmental data coverage.	1 Water Main Can't do.			Yes – vac ex to 1.5 m	Mechanica 1 excavator >1.5 m			
TP11-10	Trial Pit to increase environmental data coverage.	1. Electricity – picked up with CAT.	N/A		Yes – vac ex to 1.5 m	Mechanica 1 excavator >1.5 m			
TP11-14	Trial Pit to target former stores and environmental data	NONE	NA		Yes – vac ex to 1.5 m	Mechanica 1 excavator			

GROUND DISTURBANCE PERMIT FORM

Project Number:	Location:	Date:
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LOCATION SPECIFIC DETAILS									
LOCATION	REASON / JUSTIFICATION	HAZARDS / CONSTRAINTS	RISK CONTROL MEASURES <i>(fill in all columns to record decisions – use n/a as required)</i>						
			Prove services (method)	Isolate services	Starter Pit (method)	Excavation Method (specify)	Relocate	Battering/ Benching/ Shoring	Other (specify)
	coverage.					>1.5 m			

HAZARD PROMPT LIST for specific ground disturbance locations (NOT exhaustive):

- Underground services
- Parallel or crossing services
- Overground/overhead services
- ANY OTHERS?
- Limited laydown areas for material stockpiling
- Unstable ground conditions
- Potentially unstable slopes
- Adjacent to buildings or other above ground structures
- Limited access/egress to work area
- Site plan / traffic movements



Part A – Job Details

Project Number: 50065-29	Date: 07/07/11	Permit Valid From: 07/07/11
Client: NGAT	Location: Maelor, Wrexham	Permit Valid To: 13/07/11
Name of Site Supervisor: Alan Smith		
Name of Company performing ground disturbance work: C & S Driveways		
General description of work to be undertaken and reason for excavation: Reinstatement of trial pits x 4. Using mini excavator to remove 450 mm of backfill before reinstatement to specification.		
See table overleaf for list of location-specific reasons / justifications.		

Part B – General Ground Disturbance Hazards Identified and Assessed

☐ Unstable ground conditions	☐ Deep excavations (working from height)	☒ Open Excavations	☒ Slips/trips
☐ Hazardous material (asbestos)	☐ Sharps (made ground)	☒ Soil/water contamination	☐ Ground gas/volatiles
☐ Hot work (a separate permit will be required)	☒ Hand tools (concrete cutter/corer, etc)	☒ Manual Handling	☒ Dust
☐ Other (specify)			

See table overleaf for list of location-specific hazards.

Part C – General Ground Disturbance Work Controls to be Implemented

☒ Ground Disturbance Checklist completed	☒ Utility plans available on site	☒ HSSE Plan completed and approved
☒ Method statements/risk assessments completed and available on site	☒ Emergency Response Plan communicated	
☒ Emergency contact numbers available	☒ CAT and Genny available on site	☒ Warning signs/fencing/barriers
☒ Exclusion zone set up	☒ Gas monitoring/personal gas monitors	☒ PPE (refer to risk assessment/method statements)
☒ Banksman	☐ Dampening down	☐ Other:

See table overleaf for list of location-specific work controls.

Part D – Permit Issue and Acceptance

Permit Authoriser			
Name: JOE GODWIN	Signature: J. Godwin	Date: 6/7/11	'Authorization is given to commence work under the conditions prescribed on this Permit.'
Permit Issuer (e.g. Site Supervisor)			
Name: Alan Smith	Signature: Alan Smith	Date: 5/7/11	'I confirm that all controls have been checked and communicated and that the pre-conditions are met. Work specified on this Permit may proceed subject to the Work Party adhering to all pre-conditions and are aware of all safety precautions associated with the job.'
Permit Holder (Person Undertaking Work)			
Name: Craig Matthews	Signature: [Signature]	Date: 7.7.11	'I have been shown/understand all controls and I understand and accept the conditions and precautions detailed above. I shall ensure that all personnel involved in the work described are informed of them.'

Part E – Permit Handback and Closure

Permit Issuer (e.g. Site Supervisor)			
Name: Alan Smith	Signature: Alan Smith	Date: 12.7.11	'I confirm that all work for which this Permit was issued has been completed, the area backfilled, barriers removed, and the workplace has been inspected and is in a clean and safe condition.'



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Appendix II Chemical Risk and COSHH Assessments



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Appendix III Relevant Client HSE Information



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Appendix IV Site Staff Competency Records



All sites operating excavators with a quick hitch system should ensure the following requirements are completed by each excavator / quick hitch operator:

Supply Company:
Machine & Fleet No.:
Type of Quick Hitch:

Check	Yes / No
Has the driver been trained in both how the quick hitch device fitted to this excavator operates safely and the safe systems of work to be adopted?	
Is there a diagram or manual available for the drivers reference?	
Remember there are manual, semi-automatic and automatic types, but many different manufacturers. Can the machine driver, demonstrate the competence to operate the machine with a quick hitch device including swapping attachments / buckets?	<i>Supervisor answer:</i>
As part of a safe system of work is the daily checklist completed honestly and correctly?	
Does the driver get out of the cab to check correct engagement of all parts every time there is a swap and during operations?	
Are the necessary security pins and circlips, or the 'spring' on fully automatics fitted / engaged correctly?	
Do operatives working around machines with quick hitch devices have an understanding of the machines potential danger and limitations?	
IF ANY ANSWER IS NO then stop work and arrange replacement of driver and/or equipment.	
Operator Name:	Signature:
	Date:

Results approved by Site Supervisor:		
Name:	Signature:	Date:

All machine drivers should have a clear understanding of the consequences of failing to adhere to a safe system of work.



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Appendix V

Sub-Contractor Risk Assessments and Method Statements



CONTRACTOR RISK ASSESSMENT & METHOD STATEMENT REVIEW FORM					
Contractor: _____			SITE: _____		
☐ On Approved List? Date checked: _____			JOB NO: _____		
☐ Has Contractor been given Site and Client-Specific Information?					
Task/Document(s) Reviewed:					
#	CHECKS	YES	NO	COMMENTS/ACTIONS	DONE?
1	Are the Risk Assessment and Method Statement site specific?				
2	Do the Risk Assessment and Method Statement include client requirements?				
3	Have all hazards been identified, including hazards for visitors/members of the public and to the environment?				
4	Are the risks assessed and controls/precautions identified?				
5	Does the MS refer to the RA and do they compliment each other?				
6	Are hazardous substances identified and COSHH assessed?				
7	Has adequate supervision been considered and responsible persons identified?				
8	Have adequate resources (labour, plant, equipment, materials) been identified?				
9	Are ground disturbance, lifting and/or confined space entry involved? If so, have we communicated the need for Permits?				
10	Are PPE requirements identified and are they sufficient? Including gloves (type), goggles, ear defenders, RPE.				
11	Are delivery, offloading, storage and refuelling arrangements adequate?				
12	Does the RA/MS incorporate the manufacturer's recommendations for PPE and operation constraints for equipment used? If unsure, ask.				
13	Are troubleshooting/on-site maintenance tasks included?				
14	Have waste management/control/reduction and energy use minimisation been considered and addressed?				
15	Have potential sources of spills/releases been identified, and are controls adequate?				
16	Have non-standard ('fault') operating conditions been identified and addressed?				
17	Have emergency procedures (including shutdowns for equipment) been addressed?				
Site Supervisor must check one of the following:					
☐ Document(s) reviewed and accepted, work may proceed. OR ☐ Actions complete, work can proceed					
SIGNATURE OF SITE SUPERVISOR:				DATE:	
SIGNATURE OF PROJECT MANAGER:				DATE:	
SIGNATURE OF HSSE ADVISOR:				DATE:	



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Appendix VI WorleyParsons Method Statements and Risk Assessments



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Appendix VII Emergency Response Procedures



EMERGENCY RESPONSE PROCEDURES FOR ENVIRONMENTAL INCIDENTS

INTRODUCTION

These Emergency Procedures have been developed to provide guidance for the methods of dealing with occurrences that could threaten the health and safety of site operatives and the general public, as well as the environment.

OCCURRENCES COVERED BY THE NOTES

1. Gas leakage from above- or below-ground plant.
2. Encountering contaminated soil or groundwater.
3. The breach of an underground pipe containing oil or liquid tar.
4. The breach of a tank containing contaminated water.
5. Accidental discharge of contaminated liquid.
6. The occurrence of elevated dust levels.
7. The occurrence of elevated vapour levels.
8. Accidental discharge of oil, petrol or diesel from plant.

In the event of an emergency, the team member that observes this condition should give an emergency alarm (fire alarm, vehicle horn, shout etc.). All unnecessary communications should cease and the person giving the alarm should notify the Site Supervisor. Actions to be taken will be dictated by the emergency. Any injured personnel should be taken to the designated local medical facility and all uninjured personnel should remain in a safe area.

Information on the nature of the site and the contamination likely to have affected the injured person(s) should be given to Doctors, Paramedics etc.

All incidents, including spills or leaks, must be reported to National Grid Gas (NGG) via the Authorising Engineer who is likely to have issued and signed the work permit for the job.

1. GAS LEAKAGE FROM ABOVE- OR BELOW-GROUND PLANT

If gas leakage occurs or is suspected (whether related to the work supervised by WP or not), the following procedure should be followed:

1. Machinery should be switched off immediately (without being moved).
2. The area should be evacuated.
3. NGG should be informed on the emergency telephone number **0800-111-999**.
4. The NGG authorising engineer should be informed, if appropriate.
5. Direction with regard to continuing work must be sought from the Authorising Engineer.



2. ENCOUNTERING CONTAMINATED SOIL OR GROUNDWATER

Hazard

Contaminants may be hazardous to human health or the environment in a variety of ways, dependent on the contaminant.

Equipment and Materials Required

- Personal protective Equipment (PPE; as detailed in Section 4 of the Health and Safety Plan).
- Monitoring equipment (Photo-ionisation detector – this will be operated by the WP Site Supervisor).

Action

1. The WP Site Supervisor or delegate will be sufficiently experienced to determine the required action. Options include enhanced PPE, instigation of air monitoring or suspension of the works.

3. THE BREACH OF AN UNDERGROUND TANK CONTAINING OIL OR LIQUID TAR

Hazard

The immediate hazard is the potential for contamination of soil on or off site, and any surface water courses.

The less immediate, but most significant, hazard is the potential for contamination of groundwater beneath the site. The breach will typically occur in the side or top of a tank. A breach on the top of the tank will not constitute a hazard unless its contents are under pressure.

Equipment and Materials Required

- Excavator
- Easily accessible absorbent material, e.g. sawdust or spill kit.

Action

1. If a breach has occurred in the side wall of an underground tank, there is little choice except to empty the contents of the tank to a level below the breach.
2. The immediate action, however, should be to use absorbent materials to soak up the liquid leaking from the breach. If necessary, a stack should be built up around the breach, to allow a head of liquid to be built up to prevent further flow.
3. Once the flow from the tank is under control, plans for the emptying of the tank to the required level should be made without delay.



4. BREACH OF A TANK CONTAINING CONTAMINATED WATER

Hazard

If an underground tank (or pipe) containing contaminated water is breached, the immediate hazard is the potential for contamination of groundwater and surface water courses. Soils are less likely to be severely effected as most contaminants have a limited solubility in water.

Equipment and Materials Required

- Excavator
- Portable pump with 3 m suction head (diesel powered only)
- Holding tank – 10 m³

Action

1. The tank will leak if breached at the side or at the base. The immediate action is to form a bund around the breach with native material sufficient to build up a head to prevent further flows.
2. The contents of the tank should then be drawn down to a level below the breach. Water from the tank should be pumped into a holding tank, to await appropriate disposal.

5. ACCIDENTAL DISCHARGE OF CONTAMINATED LIQUID

Hazard

It is possible that poor surface water control could allow contaminated waters to move towards and contaminate the on or off site drainage system or surface water.

Immediate Action

1. If contaminated liquids are noticed in the drainage system or nearby surface water, or are suspected of entering such, then the immediate action is to notify the Environment Agency (telephone number 0800 807060) and NGG (the authorising engineer, if appropriate).
2. The source of the contaminated liquids must be identified as a priority. The appropriate action should then be taken.



6. THE OCCURRENCE OF ELEVATED DUST LEVELS.

Hazard

As well as being a nuisance to workers and the general public, dust can also provide a transport mechanism for contaminants, especially asbestos and heavy metals. It is therefore desirable to keep dust levels to a minimum.

Immediate Action

1. In particularly dry conditions, and where there is little hard-cover, damping down with water should be employed.
2. Depending on the nature of work to be undertaken and the presence of sensitive receptors, it may be deemed necessary to undertake dust monitoring.
3. The wearing of dust masks may be instructed by the Site Supervisor.

7. THE OCCURRENCE OF ELEVATED VAPOUR LEVELS.

Hazard

As well as being a nuisance to workers and the general public, vapours can also present a direct health risk, depending on the compounds and concentrations present. It is therefore desirable to keep vapour levels to a minimum.

Immediate Action

1. Routine vapour monitoring will be undertaken by WP where a risk from organic vapours has been perceived as significant.
2. Monitoring for organic vapours is normally achieved using a photo-ionisation detector (PID), which has to be calibrated for the contaminant of interest. For a general site investigation it is usual to calibrate the PID for benzene, which is one of the most commonly-encountered volatile organic compounds (VOCs) and also one of the most hazardous (it is a proven carcinogen). The COSHH LTEL for benzene is 1 ppm and a guidance STEL is 3 ppm (see Appendix II).
3. If work is being undertaken on a site where other specific VOCs are suspected, then consideration should be given to calibrating the PID accordingly.
4. During vapour monitoring, if 90 % of the occupational exposure limit (Appendix II) is exceeded, then work will cease and the situation will be re-assessed. If soil being excavated is the source of the problem, the working method will be adjusted such that the soil is covered as often as possible. The use of sawdust as a covering and mixing medium is often effective in controlling vapour emissions.
5. If the vapour concentrations continue to be unacceptable, then the Site Supervisor will determine whether work should be abandoned, or whether it is appropriate to continue using suitable respiratory protection.



8. ACCIDENTAL DISCHARGE OF OIL, PETROL OR DIESEL FROM PLANT

Hazard

Equipment and vehicles used during the investigation will use diesel or petrol fuel and may use hydraulic oil. Any spill or leakage of this could result in contamination of the ground surface and potentially the drainage network and surface water, with a resultant hazard to human health and the environment.

Equipment and Materials Required

- Drip tray
- Absorbent material (or spill kit).

Action

1. Any spill should be contained and mopped up using absorbent material.
2. Leaking **equipment** must be shut down and repaired. Equipment failure or accidental damage should be addressed in a similar manner

9. ENCOUNTERING UNEXPLODED ORDANCE (UXO)

Hazard

Detonation of a UXO or unexploded bomb.

Action

1. Contact UXO Specialist (MACC International – 01473 655127 or BAE Systems – 01252 373232) and confirm status. If necessary, contact emergency services (999 or 112). Once the situation is under control, contact the project manager.
2. Evacuate immediate site area and prevent people from re-entering. Site staff should ensure that as far as is reasonably practicable, all equipment is made safe and their work area is left so that no secondary hazards are created by the act of evacuation.
3. Proceed to muster point and await confirmation of suspected item.



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Appendix VIII Daily Site Record Forms



DAILY SITE RECORD SHEET

DATE: 10th May 2011 SITE NAME: Maelor Works, Wrexham
PROJECT CODE AND NAME: 50065-29
WEATHER: Sunny spells, breezy. Occasional rain showers

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
TROY COLES - Service Location Ltd	0915	1545
ALAN SMITH - SITE SVR	0845	1630
ADRIAN SHIELDS	0845	1310

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

1 x Steel stores	
1 x Welfare Unit	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Took receipt of steel stores and welfare unit. Conducted HSSE Induction. Walked site locations with Adrian Shields & marked all out except in WWU compounds. Cleared about 50% of locations. T Coles left site early for appt but ensured all locs to be cleared by tomorrow.
--

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓	NA
✓	Emily checked (PCT) 10.05.11
✓	NA
✓	
Q	NA
✓	



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DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☒	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☒	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☒	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☒	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
T. Coles			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: Site SR

Name: Alan Smith

Signature:



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 12th May 2011

SITE NAME: Maelor Works, Wrexham

PROJECT CODE AND NAME: 50065-29

WEATHER: Overcast with sunny spells - Cool

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH - SITE SUR	0815	1630
TROY COLES	0840	1610

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

1 x Steel stores	
1 x Welfare Unit	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Continued cleaning proposed SI locations. All marked in BLUE. Possible to move some locations except ones Troy Coles has strictly said 'NOT TO BE MOVED' on plans.
1430-1530 Went around site to take a photo record of pre SI locations & conditions.

DAILY CHECKS:

Monitoring/measuring equipment check
 CAT & Genny function check
 Equipment and plant check/inspection
 Subcontractors plant check/inspection
 Data downloaded/backed up
 Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
2
✓



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour cones	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify)			
Control Measures:			
AS INDUCTION / TOOLBOX TALK 11/05/11			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature
WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):			
Position: SITE SR		Name: ALAN SMITH Signature: Alan Smith	



DAILY SITE RECORD SHEET

DATE: 17th May 2011 SITE NAME: Maelor Works, Wrexham

PROJECT CODE AND NAME: 50065-29

WEATHER: Cloudy & warm. Light showers

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR)	0845	1725
DANIEL MURRAY (OSDS)	0910	1710
NATHAN FINNAN "	0910	1710

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

1 x SKIP	1 x Steel stores
1 x SUMP PALLET	4 x 205L Barrells -
1 x Welfare Unit	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Delivery of skip received.

Delivery of sump pallet & barrells received.

Vacuum excavated TP11-07 along one width side & one length. Had to move slightly due to metal girder at $\approx 0.6m$ in concrete (don't want JCB ripping this out at lateral extent of bar unknown. Concrete at $\approx 0.4m$ and 200mm thick.

Permits to dig actioned by FLOGAS for this TP.

DAILY CHECKS:

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

NOTES:

✓	
✓	
✓	
✓	
✗	
✓	



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

AS INDUCTION

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SUR

Name: ALAN SMITH

Signature:

Alan Smith



DAILY SITE RECORD SHEET

DATE: 18th May SITE NAME: Maelor Works, Wrexham
PROJECT CODE AND NAME: 50065-29
WEATHER: Cloudy, warm

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR)	0820	1745
DANIEL MURRAY (OSDS)	0835	1730
NATHAN FINNAN "	0835	1730

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

TP11-08 (a double trial pit) was proved to be clear of services to 1.5m
Went to area of MW11-12 and positively proved a gas main & unidentified service with power signal (likely electric).

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
2
✓



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: Tool Box talk on Vacuum excavation equipment received.

Hazards:

☐ Confined space	☒ Flammables (fire/explosion)	☒ Mobile plant (drill rig, excavator)
☐ High risk positioning	☒ Chemical contact (COSHH)	☒ Sharps
☐ Poor lighting	☒ Gas (toxic/non-life supporting)	☐ Aggressive behaviour
☒ Extreme temperatures	☒ Electric shock	☐ Plants/animals
☒ Sun exposure	☒ Site traffic	☒ Driving (incl. total hours)
☒ Hazardous vapour concs	☒ Uneven ground – slips/trips/falls	☒ Overhead services
☐ Poor ventilation	☒ Hazardous materials	☒ Overhead obstructions
☐ Dangerous pressure	☒ Contaminated soil/water	☒ Underground services
☐ Radiation	☒ Deep water	☒ Underground tanks
☒ Manual handling	☒ Excavations	☒ UXO
☒ Hand tools	☐ Isolated site/poor visibility	☐ Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

☒ Shut-down of vac-ex truck

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
Daniel Murray			
NATHAN FINNEN			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SUR

Name: ALAN SMITH

Signature:

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEETDATE: 19th May 2011.

SITE NAME: Maelor Works, Wrexham

PROJECT CODE AND NAME: 50065-29

WEATHER: Sunny

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUP) WORLEY PARSONS	0810	
DANIEL MURRAY (OSDs)	0810	1620
NATHAN FINNAN "	0810	1620

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

As 17/5/11

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Prooved no services entered trial pit TP11-11 to 1.5m bgl.
TA105 & TA1-06 were on thick ^{solid} hard concrete & could not be successfully jack-hammered.
MW11-12 was cored to 500mm (max diamond cutter could reach) and was still in concrete!

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

✓
✓
✓
✓
2
✓

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORMTask or Topic Discussed: *Sunstroke***Hazards:**

☐	Confined space	☒	Flammables (fire/explosion)	☒	Mobile plant (drill rig, excavator)
☐	High risk positioning	☒	Chemical contact (COSHH)	☒	Sharps
☐	Poor lighting	☒	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☒	Extreme temperatures	☒	Electric shock	☐	Plants/animals
☒	Sun exposure	☒	Site traffic	☒	Driving (incl. total hours)
☒	Hazardous vapour concs	☒	Uneven ground – slips/trips/falls	☒	Overhead services
☐	Poor ventilation	☒	Hazardous materials	☒	Overhead obstructions
☐	Dangerous pressure	☒	Contaminated soil/water	☒	Underground services
☐	Radiation	☐	Deep water	☒	Underground tanks
☒	Manual handling	☒	Excavations	☒	UXO
☒	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:*As it looked to be a hot day the signs & symptoms of Sunstroke were discussed.**To prevent → take regular stop/rest breaks**Keep back of neck covered**Drink plenty of water / Fluids.*

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
<i>Daniel Murray</i>	<i>[Signature]</i>		
<i>Nathan Finnan</i>	<i>[Signature]</i>		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):Position: *SITE SUR*Name: *ALAN SMITH*Signature: *[Signature]*



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 20th May 2011 SITE NAME: Maelor Works

PROJECT CODE AND NAME: 50065-29

WEATHER: Sunny intervals. Cool & breezy

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (Site sup) WP	0800	1600
DANIEL MURRAY (OSDS)	0800	1600
NATHAN FINNAN "	0800	1600

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

As 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Did 3m length of TP11-12 to 1.5m

Samples collected at 1530

Hazard prevention: Herras fencing around TP11-11 as ~~land~~ pit had settled due to the amount of water.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
✓
✓

**DAILY TOOL BOX TALK RECORD FORM****Task or Topic Discussed:****Hazards:**

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

*Other (specify)***Control Measures:****Emergency procedures discussed:****Additional items discussed:****PERSONS ATTENDING TOOL BOX TALK:**

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):Position: SITE SVRName: ALAN SMITHSignature: Alan Smith



DAILY SITE RECORD SHEET

DATE: 23rd May 2011 SITE NAME: Maelor Works
 PROJECT CODE AND NAME: 50065-29
 WEATHER: Overcast, drizzle. High winds

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Alan Smith (Site SUP) WP	0915	1730
Nathan Finnan OSDS	0930	1715
Daniel Murray OSDS	0930	1715
Challenger Site Services x1	0955	1000

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

As 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Challenger Site Services → Cleared toilet in welfare unit
Mw11-03 Cleared to 1.5m bgl
Gas & black plastic pipe confirmed location
Mw11-15 to 1m bgl. Attempted to look for pipe
giving off signal but not encountered.

DAILY CHECKS:

Monitoring/measuring equipment check
 CAT & Genny function check
 Equipment and plant check/inspection
 Subcontractors plant check/inspection
 Data downloaded/backed up
 Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
X
✓



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: *Strong winds / gales*

Hazards:

☐	Confined space	☒	Flammables (fire/explosion)	☒	Mobile plant (drill rig, excavator)
☐	High risk positioning	☒	Chemical contact (COSHH)	☒	Sharps
☐	Poor lighting	☒	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☒	Electric shock	☐	Plants/animals
☒	Sun exposure	☒	Site traffic	☒	Driving (incl. total hours)
☒	Hazardous vapour concs	☒	Uneven ground – slips/trips/falls	☒	Overhead services
☐	Poor ventilation	☒	Hazardous materials	☒	Overhead obstructions
☐	Dangerous pressure	☒	Contaminated soil/water	☒	Underground services
☐	Radiation	☐	Deep water	☒	Underground tanks
☒	Manual handling	☒	Excavations	☒	UXO
☒	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify) *Hazardous weather condition*

Control Measures:

Due to stormy weather (wind gusts predicted to be upto 70 mph) we will stay away from trees on-site.

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
<i>NATHAN FURMAN</i>	<i>[Signature]</i>		
<i>DANIEL MURRAY</i>	<i>[Signature]</i>		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: *SITE SVR*

Name: *ALAN SMITH*

Signature: *[Signature]*



DAILY SITE RECORD SHEET

DATE: 24th May 2011 SITE NAME: Maelor Works

PROJECT CODE AND NAME: 50065-29

WEATHER: Overcast, sunny spells. Windy

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR) WP	1000	1730
NATHAN FINNAN OSDS	1045	1700
DANIEL MURRAY OSDS	1045	1700

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

As 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

OSDS arrived 1045 as high pressure had burst hose at end of yesterday which had to be repaired.
Finished MW11-15 to 1.5m. Did not find anything on signal to the south.
Cleared 2 sides of TP11-10 to 1.5m - services pointed out by Karl Tozer of well.
MW11-04 cleared to 1.5m bgl

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
X
✓



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SVR

Name: ALAN SMITH

Signature: Alan Smith



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 25th May 2011 SITE NAME: Maelor Works
PROJECT CODE AND NAME: 50065-29
WEATHER: Overcast & showers

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUP) WP	0830	1800
DANIEL MURRAY (CDS)	0830	1630
NATHAN FINNAN	0830	1630

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

TP11-04 : At 0.1 m solid concrete - 300 mm thick Prooved Black metal gas pipe (poss elec running through) .
TP11-02 cleared to sides to 1.5 m hgt
MW11-08 Did to 0.7m - hit solid concrete pad

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

☒
☒
☒
☒
☒
☒



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: SAFETY WITHIN THE AGE

Hazards:

☐	Confined space	☒	Flammables (fire/explosion)	☒	Mobile plant (drill rig, excavator)
☐	High risk positioning	☒	Chemical contact (COSHH)	☒	Sharps
☐	Poor lighting	☒	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☒	Extreme temperatures	☒	Electric shock	☐	Plants/animals
☒	Sun exposure	☒	Site traffic	☒	Driving (incl. total hours)
☒	Hazardous vapour concs	☒	Uneven ground – slips/trips/falls	☒	Overhead services
☐	Poor ventilation	☒	Hazardous materials	☒	Overhead obstructions
☒	Dangerous pressure	☒	Contaminated soil/water	☒	Underground services
☐	Radiation	☐	Deep water	☒	Underground tanks
☒	Manual handling	☒	Excavations	☒	UXO
☒	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Flame retardant overalls must be worn at all times.

Mobile phones SWITCHED OFF

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
NATHAN FINNAN			
DANIEL MURRAY			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: ALAN SMITH Name: SITE SUR Signature:

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEETDATE: 26th May 2011 SITE NAME: Maelor works

PROJECT CODE AND NAME: 50065-29

WEATHER: Sunny spells. Heavy showers & windy.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR) WP	0830	1600
DANIEL MURRAY OSDS	0900	1600
NATHAN FINNAN "	0900	1600

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

MW11-07 : CAT & Genny used to timely prove gas main. Signal to N of loc proved as 1 elec + 1 pipe (redundant - hole in it).
Gas main / pipe N of Area A proved
TA11-03 Dug to 0.9m & hit concrete slab.
All areas checked & backfilled if necessary e.g. due to settlement.

DAILY CHECKS:

Monitoring/measuring equipment check
 CAT & Genny function check
 Equipment and plant check/inspection
 Subcontractors plant check/inspection
 Data downloaded/backed up
 Site left in secure/tidy/safe condition

NOTES:



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
<i>Other (specify)</i>			
Control Measures:			
AS INDUCTION & PREVIOUS TOOL BOX TALKS			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SUR

Name: ALAN SMITH

Signature: Alan Smith



DAILY SITE RECORD SHEET

DATE: 01/06/11

SITE NAME: Maelor

PROJECT CODE AND NAME: 50065-29 Site Investigation

WEATHER: Dry + Overcast

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
C. Meakin (WP) Site Supervisor	09:00	17:30
Craig Hawke CCGI	09:30	17:00
Stuart Hawthorne CCGI	09:30	17:00

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

CEU Welfare Unit	1 x Skip.
Elliot Steel Store	3 x Heras fence panels.
4 x drums + Sump Pallet	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Gave Site Induction. + met with Kevin Jones. (WP)
↳ discussed work plan for day.
Started MW11-11 : Coring + hand pitting. Had to stop hand pitting @ 0.7m due to perched water ingress. Covered with pallet + cones whilst waiting to see if water subsides.
Dug + installed MW11-11 to 4.1m bgl.
Broke lock on access gate as per instructions by Kevin Jones.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓	Calibrated P.D. + Entree.
✓	
✓	
✓	
	W/A
✓	



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
<i>Other (specify)</i>			
Control Measures:			
N/A Site Induction			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):		
Position: <i>Site Supervisor</i>	Name: <i>C. Meekin</i>	Signature: <i>C. Meekin</i>

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 2/6/11

SITE NAME: Moelur

PROJECT CODE AND NAME: 50065-29 Site Investigation

WEATHER: Dry + Overcast.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
C. Meakin Site Supervisor (WP)	08:00	08:30
Craig Hawke (CCGI) Lead driller.	08:00	18:15
Stuart Hawthorne (CCGI) driller.	08:00	18:15

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

CU Welfare Unit	1 x Skip.
Elliot Steel Store.	3 x Herros fence panels.
4 x drums + Jump Pallet	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Drilled + installed MW11-16 : difficult to excavate hand pit due to MG: concrete + brick. = very slow.

Handpilled MW11-02. Before drilling consulted with Warr. Kevin Jones happy with BU location and for us to start drilling. drilled to ~5m. Problems with hole collapsing and couldn't ease off due to not having narrow casing. Large diameter casing won't get through concrete: will complete + install next week

DAILY CHECKS:

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

NOTES:

✓ - fresh air cd.

✓ - CAT working ok.

✓ Multimeter

✓ - Fresh drill rig.

N/A

✓



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed: Live Gas Infrastructure.			
Hazards:			
☐	Confined space	☒	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☒	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☒	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☒	Overhead services
☐		☐	Overhead obstructions
☐		☒	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
<i>Other (specify)</i>			
Control Measures: Services Survey			
Services Plan.			
Hand pitting to 1.5.			
Liawon with Plant protection			
Be aware of surroundings when moving plant/vehicles.			
CAT & Gerry - if Cost Iron			
Emergency procedures discussed:		☒	
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature
Craig Hume	[Signature]		
STUART HAWTHORNE	S. Hawthorne		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):		
Position: S.E. Supervisor	Name: C. Meakin	Signature: [Signature]



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 3/6/11 SITE NAME: Mcelor
PROJECT CODE AND NAME: 50065-29 SI
WEATHER: CLEAR + Sunny.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Chris Meekin W? Site Supervisor	08:00	15:00
Craig Clarke CCGI Lead Driller.	08:00	15:00
Stuart Hawthorne CCGI Driller	08:00	15:00

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

Welfare Unit.	1 x Skip.
Elliot Hire Steel Store.	
4 Drums + Sump Pallet.	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Drilled + installed MW11-12. Drilled to 5.1m. Installed to 3.5m. After consultation with water plant protection moved MW11-13 to north of fence line and hand pulled to 1.5m. Backfilled ready for drilling on Monday.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓	Fresh air Cal.
✓	Working.
✓	
✓	Drill rig working.
✓	



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Sun stroke / heat exhaustion.

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☒	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Stay hydrated.

Use Suncream (though be aware of allergies)

Collar up to protect neck

hard hat to protect head.

take breaks as needed.

Be aware of symptoms: nausea, dizziness, headache, light headedness.

Emergency procedures discussed:



Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
C. HAWKE			
S. HAWTHORNE			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: Site Supervisor

Name: C. Meakin

Signature:



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 6th June 2011

SITE NAME: Maelor works

PROJECT CODE AND NAME: 50065-29

WEATHER: Overcast & dry

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR) WP	0900	1810
CRAIG HAWKE (LEAD DRILLER) CCGI	0900	1810
STUART HAWTHORNE	0900	1810

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

MW11-13 - Drilled to depth & installed
MW11-12 - Concrete cored to 500mm: barrel was full & concrete did not snap so couldn't go deeper.
MW11-17 - Drilled to depth & installed.

DAILY CHECKS:

NOTES:

Monitoring/measuring equipment check



CAT & Genny function check



Equipment and plant check/inspection



Subcontractors plant check/inspection



Data downloaded/backed up



Site left in secure/tidy/safe condition





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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: Emergency stops / fire extinguisher etc
on rig.

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☒	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify) Fire, general emergency

Control Measures:

Craig Hawke showed Alan Smith emergency stop buttons
fire extinguisher & explained process of safety features
to prevent rig over-working & cage system.

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
S HAWTHORNE	S. Hawthorne		
C HAWKE	C. Hawke		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SR

Name: ALAN SMITH

Signature: Alan Smith



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 7th June 2011

SITE NAME: Maelor works

PROJECT CODE AND NAME: 50065-29

WEATHER: Overcast with sunny spells.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUR) WP	0815	1800
CRAIG HAWKE (LEAD DRILLER) CCGI	0815	1745
STUART HAWTHORNE (DRILLER) CCGI	0815	1745

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

MW11-15 - drilled to depth & installed
MW11-18 " " " " "

DAILY CHECKS:

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
✗
✓



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
S HAWTHORNE	S. Hawthorne		
C HAUKE	C Hauke		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SUR

Name: ALAN SMITH

Signature: Alan Smith



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 8th June 2011 SITE NAME: Maelor works

PROJECT CODE AND NAME: 50065-29

WEATHER: Overcast, sunny spells, breezy

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUP) WP	0815	1830
GRACE HAWKE (LEAD DRILLER) CCGI	0820	1830
STUART HAWTHORNE (DRILLER) CCGI	0820	1830

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/5/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Re-cased & drilled MW11-02.
Drilled MW11-05 to depth - hit concrete base and advised NOT to drill further. Installed screening Made Ground.
Attempted to drill MW11-07 & 08 but concrete was > 500mm thick: JCB required.

DAILY CHECKS:

NOTES:

Monitoring/measuring equipment check

✓

CAT & Genny function check

✓

Equipment and plant check/inspection

✓

Subcontractors plant check/inspection

✓

Data downloaded/backed up

X

Site left in secure/tidy/safe condition

✓



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: *Striking services beneath concrete*

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☒	Underground services
☐	Radiation	☐	Deep water	☒	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Concrete is known to exist at locations at 0.5m & 0.7 mbgl; once/if get through concrete, MUST hand pit to 1.5 mbgl to clear for services.

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
<i>S. HAWTHORNE</i>	<i>S. Hawthorne</i>		
<i>C. HAWKE</i>	<i>C. Hawke</i>		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: *SITE SUR*

Name: *ALAN SMITH*

Signature: *Alan Smith*

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 9th June 2011 SITE NAME: Maebor works

PROJECT CODE AND NAME: 50065 - 29

WEATHER: Sunny & warm

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (Site SVR) WP	0820	1745
CRATGE HAWKE (Lead driller) CCGI	0820	1745
STUART HAWTHORNE (") CCGI	0820	1745

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/05/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Drilled MW11-04 to depth & installed.
Obtained permit for FLOGAS & attempted to
drill MW11-10 directly to EOF holder base -
concrete > 500mm thick - abandoned until JCB
Drilled MW11-06 to depth & installed.
FLOGAS permit signed - off & handed back.

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check	☒
CAT & Genny function check	☒
Equipment and plant check/inspection	☒
Subcontractors plant check/inspection	☒
Data downloaded/backed up	☒
Site left in secure/tidy/safe condition	☒



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed: Mobile phone use in Flagas

Hazards:

☐	Confined space	☒	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Mobile phones to be switched off & locked in cabin while working in the Flagas area

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature
S HAWTHORNE	S. Hawthorne		
C HAVKE			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SUR

Name: ALAN SMITH

Signature: Alan Smith



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 10th June 2011 SITE NAME: Maelor Works

PROJECT CODE AND NAME: 50065-29

WEATHER: Dry & Sunny

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (SITE SUP) WP	0845	1800
CRAIG HAWKE (LEAD DRILLER) CCGI	0845	1800
STUART HAWTHORNE (") CCGI	0845	1800

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 17/05/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Boreholes were fitted with Tophat covers of flush covers depending on location.
Some concreting was done until drillers ran out of ballast.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓
✓
✓
✓
✗
✓

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM**Task or Topic Discussed:****Hazards:**

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:**Emergency procedures discussed:****Additional items discussed:****PERSONS ATTENDING TOOL BOX TALK:**

Print Name	Signature	Print Name	Signature
CRAG HAWKE	C Hawke		
S HAWTHORNE	S Hawthorne		

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SITE SVR

Name: ALAN SMITH

Signature: Alan Smith



DAILY SITE RECORD SHEET

DATE: 13/6/11 SITE NAME: Maelor
PROJECT CODE AND NAME: 50065-29
WEATHER: Hot + sunny

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Alex Taylor - site supervisor - WP	9:00	18:00
Adrian Shields - WP	9:00	17:00
Craig Hawke - CCGI	9:30	18:30
Shawn Hawthorne - CCGI	9:30	18:30
Iwan Davies - Harvey Plant Hire	9:30	18:30
Grareth Jones - NCRP	11:00	13:00

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

Drill rig	welfare unit
4x border fencing	steel store
5x Heras fencing, blocks & dips	6x drums & some pallet + skip

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

- Inspected Iwan + Adrian
- used pneumatic breaker to break concrete around of MW11-12 - drilled + installed. used breaker on MW11-10
Adrian gave Grareth site walkover
Adrian offsite 17:00
Everyone else offsite 18:30

DAILY CHECKS:

NOTES:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

☒
☒
☒
☒
☒
☒

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐ Confined space	☐ Flammables (fire/explosion)	☐ Mobile plant (drill rig, excavator)
☐ High risk positioning	☐ Chemical contact (COSHH)	☐ Sharps
☐ Poor lighting	☐ Gas (toxic/non-life supporting)	☐ Aggressive behaviour
☐ Extreme temperatures	☐ Electric shock	☐ Plants/animals
☐ Sun exposure	☐ Site traffic	☐ Driving (incl. total hours)
☐ Hazardous vapour concs	☐ Uneven ground – slips/trips/falls	☐ Overhead services
☐ Poor ventilation	☐ Hazardous materials	☐ Overhead obstructions
☐ Dangerous pressure	☐ Contaminated soil/water	☒ Underground services
☐ Radiation	☐ Deep water	☐ Underground tanks
☐ Manual handling	☐ Excavations	☐ UXO
☐ Hand tools	☐ Isolated site/poor visibility	☐ Poor housekeeping

Other (specify)

Control Measures:

Used C.A.T during hand pitting.

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SS

Name: AT

Signature:

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 14/6/11 SITE NAME: Maelor

PROJECT CODE AND NAME: 50065-29.

WEATHER: Hot and Sunny.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Alex Taylor - Site Supervisor WorleyParsons	8.30	6.30
Natasha Glynn WorleyParsons	10.00	6.30
Craig Hauke. - CCGI	8.30	6.30
Stuart Hawthorne. - CCGI	8.30	6.30
Ken Buchanan - PCM	9.00	12.00
Wm Davies - Harvey Plant hire.	8.30	6.00
K. Spies - Equipe (Risk assessor)	10.00	4.00

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

Drill rig + crew.	Steel stake.
4 pieces of plastic fencing	Welding unit.
Harris fencing.	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Visit from Ken PCM - went through MSSE plan + inducted on site. Then Natasha + K Spies arrived - gave site induction. Went over to MW11-07 and MW11-08. Decided unsafe to drill MW11-08 in current position due to drain run. Moved 2 m to the east. MW11-07 - Concerned about metal service approx 3m from borehole position - checked via ex records - pipe redundant - dug down again to double check and not on concrete - finished MW11-07 - dug street at MW11-08

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check	☒	→ torque alarm going for low
CAT & Genny function check	☒	oxygen - used PID instead
Equipment and plant check/inspection	☒	
Subcontractors plant check/inspection	☒	
Data downloaded/backed up	☒	
Site left in secure/tidy/safe condition	☒	



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed: <i>High risk positioning</i>			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☒	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☒	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify)			
Control Measures:			
<i>Talked about underground services in vicinity of MW11-07-0</i>			
<i>Double checked air records and hand dug metal</i>			
<i>pipe to prove redundant.</i>			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: *Project Manager* Name: *NATASHA GLYNN* Signature: *[Signature]*

**WorleyParsons**

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NATIONAL GRID PROPERTY HOLDINGS LTD.

SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 15/6/11

SITE NAME: Hneler.

PROJECT CODE AND NAME: 50065-29

WEATHER: Rainy and overcast.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
NATASMA GLYNN - WORLEY PARSONS	8.30	
Alex Faylor - WorleyParsons Site Supervisor	8.30	
Craig Hawke - CCGI	8.00	4.00
Stuart Hawthorne - CCGI	9.00	4.00
Iwan Davies - Harvey Plant	8.30	

3rd PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

Drill rig + equipment	4 pieces red plastic fencing
JCB	Steel stake
Piercing fencing	Welding line

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Obtained permit from Plogas to work in 222. Asked Controller to check working area for gas. Finished MW11-085. Dig trial pit TP --- in Plogas area. Dig starter pit for breach MW11-10 - encountered water at 0.5, increased at 0.7 to 0.0 mbsl. Dig TP ---.

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

☒
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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☒	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☒	Overhead obstructions
☒	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Talked about working in flammable area – mobile phones switched off, no sources of ignition. Also discussed with JCB driver over head pipe work in flammable area. Had a site walkover to ensure JCB could fit under pipe work. Also changed route into service area to ensure ok.

Emergency procedures discussed:

Additional items discussed:

Trin is very wet and ground soft. Put red fencing around to prevent vehicle movements onto area and let Joe at flammable know not to let vehicles in area until dry and ground solid.

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: Project Manager

Name: Ngr

Signature: NATASHA GYNN

**WorleyParsons**

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 16/6/11

SITE NAME: Maelur

PROJECT CODE AND NAME: 50065-29

WEATHER: overcast + showers

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Alex Taylor - SS - 1	8:30	17:30
Iwan Davies	11	1
Craig Quigley	10:00	17:00

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

88 TCB	shed store
welfare	
SKID, 4 domes + 5 pallet	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Trial pits in NGC Area - TPII-02 + TPII-10 - cable noted in TPII-10 - at ~1.5m → redundant (checked that no used services were cut off) - Craig checked with Grid to make sure telemetry not cut off at 1 use box - nothing blown → reported as hazard
--

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

☒	
☒	CAT chattering on all surfaces
☒	
☒	
☒	
☒	



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☐	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position:

SS

Name:

AO

Signature:



SI CONSTRUCTION PHASE HSSE PLAN

DATE: 17/6/11	SITE NAME: Maelor
PROJECT CODE AND NAME:	500 65-29
WEATHER:	Sunny

[illegible]

As before	

Extraktor TP11-6 + TP11-8

Monitoring/measuring equipment check	☒
CAT & Genny function check	☒ chaffer on CAT
Equipment and plant check/inspection	☒
Subcontractors plant check/inspection	☒
Data downloaded/backed up	☒
Site left in secure/tidy/safe condition	☒



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
<i>Other (specify)</i>			
Control Measures:			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):		
Position: <i>SS</i>	Name: <i>AO</i>	Signature:



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NATIONAL GRID PROPERTY HOLDINGS LTD.
SITE NAME
SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 20/6/11 SITE NAME: Maelor
PROJECT CODE AND NAME: 50665-29
WEATHER: Hot

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
AT - SS-WP	9:30	18:20
Booth/Harvey - Harvey Plant	"	"

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

As before	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Area Indicated Phil - Excavated TPII-11, TPII-12, TPII-13 & TPII-14

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

☒	
☒	chiller
☒	
☒	
☒	
☒	



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
☐	Poor ventilation	☐	Hazardous materials	☐	Overhead obstructions
☐	Dangerous pressure	☐	Contaminated soil/water	☒	Underground services
☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: SS

Name: AS

Signature: 



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NATIONAL GRID PROPERTY HOLDINGS LTD.

SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET	
DATE: 21/6/11	SITE NAME: Maelor
PROJECT CODE AND NAME: 50065-2a	
WEATHER: overcast + showers	

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)		
Name and Company	Time on	Time off
AG - SS - WP	8:30	18:00
AS - "	8:30	18:00
Phil Hawley - Hawley Plant Hire	8:30	17:00

3 RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)	
As below	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)
Excavated JP11-1
- Hoses burst on JCB - hydraulic fluid
split - ~ 2L pro degradable fluid - at ~ 12:10pm
- reported as incident to CM. CM to report to
NGPH

DAILY CHECKS:	NOTES:
Monitoring/measuring equipment check	☒
CAT & Genny function check	☒ chatter
Equipment and plant check/inspection	☒
Subcontractors plant check/inspection	☒
Data downloaded/backed up	☒
Site left in secure/tidy/safe condition	☒



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify)			
Control Measures:			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):		
Position: <u>SS</u>	Name: <u>AO</u>	Signature: 

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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 22/06/11 SITE NAME: Maelor
 PROJECT CODE AND NAME: 50065-29
 WEATHER: Dry, overcast, windy, occasional sunny spells

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH - SITE SUR - WP	0845	1815

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

Welfare Unit x 1	20SL drum x 4
Steel stores x 1	Herras fencing & feet x 6
Sump pallet x 1	Barriers x 4

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

AM: All wells were dipped for product and water level from casing & GL.

Mw11-10, MW3, Mw11-11, Mw11-13, Mw11-12 & MW99-204 were purged until clear, well ran dry or 5 well volumes were reached.

NB: Mw11-10 was underwater - area appears to of flooded.

DAILY CHECKS:**NOTES:**

Monitoring/measuring equipment check
 CAT & Genny function check
 Equipment and plant check/inspection
 Subcontractors plant check/inspection
 Data downloaded/backed up
 Site left in secure/tidy/safe condition

X
 X
 ✓
 X
 X
 ✓



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed: <u>LONG WORKING</u>			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify) <u>LONG WORKING</u>			
Control Measures:			
<u>Discussed lone working procedures:</u>			
<u>call in at start of day, 1300 and end of</u>			
<u>day.</u>			
<u>Completed lone working form in HSSE plan</u>			
Emergency procedures discussed: ☐			
Additional items discussed: <u>As on lone working form</u>			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature
<u>CHRIS MEAKIN</u>	<u>CM</u>		
<u>(via telephone)</u>			

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):		
Position: <u>Site SVR</u>	Name: <u>Alan Smith</u>	Signature: <u>Alan Smith</u>



DAILY SITE RECORD SHEET

DATE: 23/06/11 SITE NAME: Maxler
PROJECT CODE AND NAME: 50065-29
WEATHER: Dry, overcast

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH - SITE SUR - WP	0845	1745

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 22/06/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Purged:
Mw11-15, Mw11-01, Mw99-102, Mw99-103, Mw99-202,
Mw99-110, Mw99-107, Mw11-04, Mw11-05, Mw11-06,
Mw11-16 until clear, dry or 5 well volumes was
reached.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

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DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify)			
Control Measures:			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature
WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):			
Position: <u>Site SVR</u> Name: <u>ALAN SMITH</u> Signature: <u>Alan Smith</u>			



DAILY SITE RECORD SHEET

DATE: 24/06/11 SITE NAME: Maelor works
PROJECT CODE AND NAME: 50065-29
WEATHER: Warm & overcast. Dry

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH - Site SVR WP	0900	1415

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 22/06/11	plus 1 additional sump pallet & 4 205L drums from 11am
-------------	--

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Purged / developed: MW99-104, MW11-02, MW5, MW99-106, MW11-08, MW11-07, MW11-17 Took receipt of 1 x sump pallet & 4 x 205L drums for waste water.

DAILY CHECKS:

Monitoring/measuring equipment check
CAT & Genny function check
Equipment and plant check/inspection
Subcontractors plant check/inspection
Data downloaded/backed up
Site left in secure/tidy/safe condition

NOTES:

✓
X
✓
X
X
✓



DAILY TOOL BOX TALK RECORD FORM			
Task or Topic Discussed:			
Hazards:			
☐	Confined space	☐	Flammables (fire/explosion)
☐	High risk positioning	☐	Chemical contact (COSHH)
☐	Poor lighting	☐	Gas (toxic/non-life supporting)
☐	Extreme temperatures	☐	Electric shock
☐	Sun exposure	☐	Site traffic
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls
☐	Poor ventilation	☐	Hazardous materials
☐	Dangerous pressure	☐	Contaminated soil/water
☐	Radiation	☐	Deep water
☐	Manual handling	☐	Excavations
☐	Hand tools	☐	Isolated site/poor visibility
☐		☐	Mobile plant (drill rig, excavator)
☐		☐	Sharps
☐		☐	Aggressive behaviour
☐		☐	Plants/animals
☐		☐	Driving (incl. total hours)
☐		☐	Overhead services
☐		☐	Overhead obstructions
☐		☐	Underground services
☐		☐	Underground tanks
☐		☐	UXO
☐		☐	Poor housekeeping
Other (specify)			
Control Measures:			
Emergency procedures discussed:			
Additional items discussed:			
PERSONS ATTENDING TOOL BOX TALK:			
Print Name	Signature	Print Name	Signature
WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):			
Position: <u>SITE SVR</u>		Name: <u>ALAN SMITH</u>	Signature: <u>Alan Smith</u>



DAILY SITE RECORD SHEET

DATE: 07/07/2011 SITE NAME: Maelor works, Wrexham
PROJECT CODE AND NAME: 50065-29
WEATHER: Overcast, dry.

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
Alan Smith (Site Sup) WP	0930	1630
C. Matthews C&S Driveways	0930	1630
S. Hughes "	0930	1630
S. Clarke "	0930	1630

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

2x Sump Pallet	1x Steel store
8x 205L barrels	2x skip (additional skip delivered)
1x welfare unit	Crash barriers & herras fencing

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Reinstatement of trial pits
TP11-05 2.1 x 2.8m = 5.8m ²
TP11-06 2.1 x 2m = 4.2m ²
TP11-01 1.2 x 2.5m = 3m ²
As per spec.
TP11-08 will be reinstated next week.

DAILY CHECKS:

NOTES:

Monitoring/measuring equipment check	X
CAT & Genny function check	X
Equipment and plant check/inspection	✓
Subcontractors plant check/inspection	✓
Data downloaded/backed up	X
Site left in secure/tidy/safe condition	✓

**WorleyParsons**

resources & energy

NATIONAL GRID PROPERTY HOLDINGS LTD.

SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY TOOL BOX TALK RECORD FORM**Task or Topic Discussed:****Hazards:**

☐	Confined space	☐	Flammables (fire/explosion)	☐	Mobile plant (drill rig, excavator)
☐	High risk positioning	☐	Chemical contact (COSHH)	☐	Sharps
☐	Poor lighting	☐	Gas (toxic/non-life supporting)	☐	Aggressive behaviour
☐	Extreme temperatures	☐	Electric shock	☐	Plants/animals
☐	Sun exposure	☐	Site traffic	☐	Driving (incl. total hours)
☐	Hazardous vapour concs	☐	Uneven ground – slips/trips/falls	☐	Overhead services
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☐	Radiation	☐	Deep water	☐	Underground tanks
☐	Manual handling	☐	Excavations	☐	UXO
☐	Hand tools	☐	Isolated site/poor visibility	☐	Poor housekeeping

*Other (specify)***Control Measures:****Emergency procedures discussed:****Additional items discussed:****PERSONS ATTENDING TOOL BOX TALK:**

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):Position: *Site SVP*Name: *Alan Smith*Signature: *Alan Smith*



WorleyParsons

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NATIONAL GRID PROPERTY HOLDINGS LTD.

SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

DAILY SITE RECORD SHEET

DATE: 12/07/11	SITE NAME: Maelor works, Wrexham
PROJECT CODE AND NAME: 50065-29	
WEATHER: Overcast, dry	

PERSONNEL ON SITE: (Include ALL Subcontractors and Visitors. Identify Site Supervisor)

Name and Company	Time on	Time off
ALAN SMITH (Site SUR) WP	0930	
CRAIG MATHEWS C&S Driveways	0930	
SEAN HUGHES "	0930	
STEVE CLARKE "	0930	

3RD PARTY PLANT & EQUIPMENT ON SITE: (list all chargeable non-PCT items)

AS 07/07/11	

SUMMARY OF DAILY ACTIVITIES: (Include any correspondence, equipment breakdowns, HS&E notes, etc)

Reinstatement of Trial Pit TPII-08 to Specification.
2 pits & vac ex scar in-between.

DAILY CHECKS:

NOTES:

Monitoring/measuring equipment check

CAT & Genny function check

Equipment and plant check/inspection

Subcontractors plant check/inspection

Data downloaded/backed up

Site left in secure/tidy/safe condition

X
X
✓
✓
X
✓



DAILY TOOL BOX TALK RECORD FORM

Task or Topic Discussed:

Hazards:

☐ Confined space	☐ Flammables (fire/explosion)	☐ Mobile plant (drill rig, excavator)
☐ High risk positioning	☐ Chemical contact (COSHH)	☐ Sharps
☐ Poor lighting	☐ Gas (toxic/non-life supporting)	☐ Aggressive behaviour
☐ Extreme temperatures	☐ Electric shock	☐ Plants/animals
☐ Sun exposure	☐ Site traffic	☐ Driving (incl. total hours)
☐ Hazardous vapour concs	☐ Uneven ground – slips/trips/falls	☐ Overhead services
☐ Poor ventilation	☐ Hazardous materials	☐ Overhead obstructions
☐ Dangerous pressure	☐ Contaminated soil/water	☐ Underground services
☐ Radiation	☐ Deep water	☐ Underground tanks
☐ Manual handling	☐ Excavations	☐ UXO
☐ Hand tools	☐ Isolated site/poor visibility	☐ Poor housekeeping

Other (specify)

Control Measures:

Emergency procedures discussed:

Additional items discussed:

PERSONS ATTENDING TOOL BOX TALK:

Print Name	Signature	Print Name	Signature

WORLEYPARSONS REPRESENTATIVE (completing Daily Site Record Form):

Position: Site Svr

Name: ALAN SMITH

Signature: Alan Smith



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

Appendix IX Incident/Near Miss Report Form

6395-1 Maelor Works, Wrexham
Site investigation locations August 2011

<u>ID</u>	<u>Type</u>	<u>Eastings</u>	<u>Northings</u>	<u>Level</u>
MW11-01	Borehole	338182.73	348254.05	Cover Level 33.40 Pipe Level 33.29
MW11-02	Borehole	338038.18	348197.89	Cover Level 37.22 Pipe Level 37.05 Ground Level 36.97
MW11-05	Borehole	338000.05	348108.58	Cover Level 36.82 Pipe Level 36.73 Ground Level 36.76
MW11-06	Borehole	338007.23	348099.14	Cover Level 36.67 Pipe Level 36.50 Ground Level 36.63
MW11-07	Borehole	337992.51	348052.40	Cover Level 36.88 Pipe Level 36.75
MW11-08	Borehole	338020.74	348049.73	Cover Level 36.89 Pipe Level 36.70 Ground Level 36.86
MW11-10	Borehole	338122.66	347956.59	Cover Level 35.48 Pipe Level 35.38 Ground Level 35.43
MW11-11	Borehole	338116.61	348027.52	Cover Level 36.91 Pipe Level 36.79
MW11-12	Borehole	338160.71	348098.25	Cover Level 36.77 Pipe Level 36.65
MW11-13	Borehole	338199.94	348026.23	Cover Level 36.42 Pipe Level 36.31
MW11-16	Borehole	338081.52	348263.91	Cover Level 36.56 Pipe Level 36.19 Ground Level 36.38
TP11-01	Trial Pit	338169.6	348126.9	Ground Level 36.77
██████	██████	██████	██████	████████████████
TP11-05	Trial Pit	338087.3	348046.0	Ground Level 36.86
TP11-06	Trial Pit	338151.5	348037.0	Ground Level 36.80
TP11-07	Trial Pit	338038.3	347960.7	Ground Level 37.12
TP11-08	Trial Pit	338126.7	348072.4	Ground Level 36.82
TP11-10	Trial Pit	338043.0	348151.4	Ground Level 36.70



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SITE NAME

SI CONSTRUCTION PHASE HSSE PLAN

HSSE INCIDENT/NEAR MISS REPORT FORM

FORWARD COMPLETED FORM TO PM / HSSE ADVISOR WITHIN 24 HOURS OF INCIDENT OCCURRING

INCIDENT ☒ or NEAR MISS ☐		OMNISAFE REPORT No.:	
SITE: <u>50065-29 Maelor</u>		JOB NO: <u>50065-29</u>	
CLIENT: <u>NG</u>		EVENT DATE/TIME: <u>21/6/11 12:10</u>	
INCIDENT LOCATION: <u>TP11-1</u>			
PROJ. MANAGER NOTIFIED: <u>Chris Meakin</u>		at DATE/TIME: <u>21/6/11 13:00</u>	
HSSE ADVISOR NOTIFIED: <u>Tim Birtlett</u>		at DATE/TIME: <u>21/6/11 13:00</u>	
TYPE: Injury (including ill health) ☐ Non-Occupational Injury/Illness ☐ Environmental Impact ☐			
Security Incident ☐ Damage to Property/Equipment ☒ Vehicle Accident ☐			
Name(s) of Person(s) Involved in Event:	First Name	Last Name	Company
	<u>Alex Taylor</u>	<u>Taylor</u>	<u>WorleyParsons</u>
	<u>Ph. J. Taylor</u>	<u>Hasveg</u>	<u>Hasveg Plant</u>
Site Supervisor :			

FULL DESCRIPTION OF INCIDENT: (who/what/where/why/how/PPE/procedures/is hazard in HSE plan?)

Whilst excavating trial pit - TP11-1, the bucket arm caught some re-bar and burst the hoses to the bucket. This caused a spray of hydraulic fluid, leaking approximately 2-3L. No-one was sprayed

(Use reverse of sheet for additional space)

ACTION TAKEN ON SITE: stopped machine. Repairs arranged to ensure hoses safe for travel. JCB driven back to yard + replacement brought. water in trial pit mixed out + sides of pit scraped.

Required First Aid? No Yes → Administered by: _____ Modified/Restricted Duties? No Yes
Treated by Medical personnel? No Yes → Treated by: _____

COST/TIME LOST DUE TO INCIDENT:

Photos taken? Yes ☒ Road/Site Conditions: Dry ☒ Wet ☐ Slippery ☐ Soft ☐ Dusty ☐
Hours worked prior to event incl. travel: 3.5 Visibility: Clear ☒ Rain ☐ Fog ☐ Bright ☐ Dusk/Dawn ☐ Dark ☐
If Vehicle Incident: Office car ☐ Office van ☐ Own vehicle ☐ Rental _____

POSSIBLE CAUSE(S):

Re-bar

RECOMMENDATIONS FOR IMPROVEMENTS TO PREVENT RECURRENCE:

Be a warden Make a water pit

SIGNATURE OF PERSON REPORTING: [Signature] DATE: 21/6/11
SIGNATURE OF PROJECT MANAGER: [Signature] DATE: 21/6/11



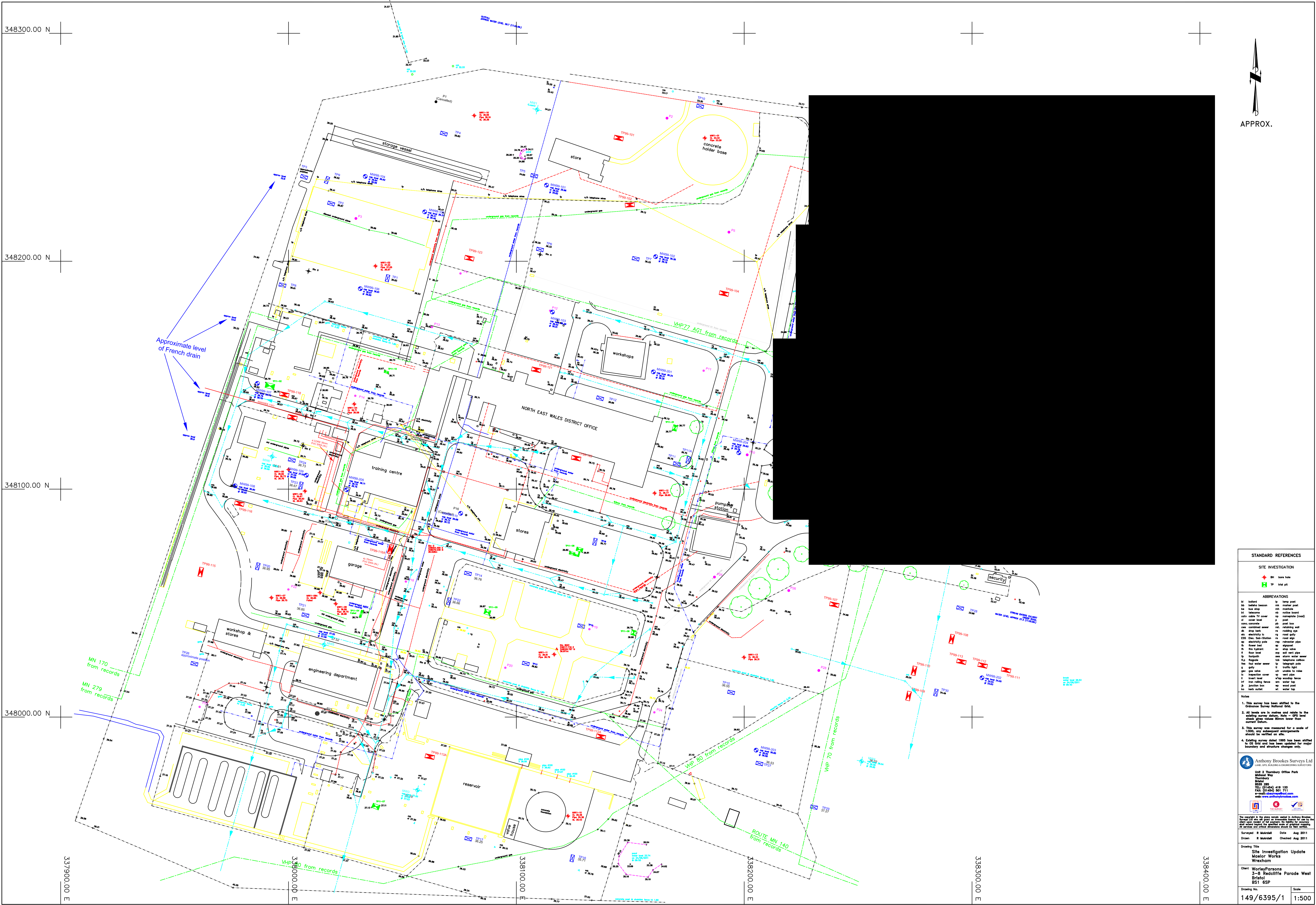
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ENVIRONMENTAL ASSESSMENT SITE INVESTIGATION REPORT
MAELOR WORKS, WREXHAM**

Appendix V Topographic Survey



STANDARD REFERENCES	
SITE INVESTIGATION	
+	BM bore hole
TP	trial pit
ABBREVIATIONS	
1. 100m	to 100m post
2. 100m	to 100m post
3. 100m	to 100m post
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Notes	
1. This survey has been carried out to the Ordnance Survey National Grid.	
2. All levels are in metres and relate to the existing survey datum, which is the Ordnance Survey datum.	
3. This survey was carried out for a scale of 1:500, any subsequent measurements should be verified on site.	
4. Existing survey dated 1995 has been utilised to OS datum and has been updated for major boundary and structure changes only.	
Anthony Brooks Surveys Ltd Local Civil, Building & Engineering Surveyors	
Unit 2, Thornbury Office Park Thornbury, Bristol BS35 9EF Tel: 01454 419 125 Fax: 01454 501 711 www.anthonybrooks.com	
The copyright in this plan shall remain with Anthony Brooks Surveys Ltd. No part of this plan may be reproduced without the written permission of Anthony Brooks Surveys Ltd. All rights reserved.	
Drawn: R. Marshall	Date: Aug 2011
Checked: R. Marshall	Checked: Aug 2011
Drawing Title: Site Investigation Update	
Master Works: Wrexham	
Client: Worle/Parsons	
3-8 Redcliffe Parade West	
Bristol	
BS1 6SP	
Drawing No:	Scale:
149/6395/1	1:500



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MAELOR WORKS, WREXHAM**

Appendix VI National Grid Waste Report

National Grid Property Limited - Environmental Monitoring

Waste Report - Site Investigations

Site: Maelor Works, Marchweil							Date: 22/10/10		Contractor/Consultant: WorleyParsons	
Disposal Off-Site										
<u>Water - Discharged to Sewer:</u>			Discharge Consent Ref: N/A				Issued by: N/A			
			Total Volume (to Date of Report):				N/A m ³ litres			
<u>Water - Removed by Tanker or Tank:</u>										
Date	Consignment Note Ref.	Disposal Site	Classification (Hazardous/Non- Hazardous/Inert)	Volume		Mileage (km)				
				m ³	litres					
05/10/20 11	NZS654/Q001 C	Envirosol Ltd, Environmental Management Facility, Collier Close, Coppice Side Industrial Park, Brownhills, West Midlands WS8 7EU	Non Hazardous Ground Water		7 * 205 L					
Total Volume (to Date of Report):				m ³ 1,435 litres						
<u>Soils - Removed to Landfill:</u>										
Landfill Tip 1		Location: Envirosol Ltd, Environmental Management Facility, Collier Close, Coppice Side Industrial Park, Brownhills, West Midlands WS8 7EU				Mileage:				
Type of Waste: (Hazardous/Non- Hazardous/Inert)			Hazardous (soils and plastics)		Total Number of Loads: 1					
Total Volume (to Date of Report):				1 * 205L m ³ drum tonnes						

Landfill Tip 2	Location: Thorncliffe Ewloe, Ewloe Barn Ind Estate, Mold Rd, Alltami CG7 6LG	Mileage:
Type of Waste: (Hazardous/Non- Hazardous/Inert)	Non Hazardous	Total Number of Loads: 1
Total Volume (to Date of Report): 1 * 10 yard m ³ skip tonnes		
Landfill Tip 3	Location: Cheshire Waste Skip Hire Ltd, Liverpool Rd, Backford, Chester CH1 6PE	Mileage:
Type of Waste: (Hazardous/Non- Hazardous/Inert)	Non-hazardous (tarmac and hard core)	Total Number of Loads:
Total Volume (to Date of Report): m ³ 8 tonnes		



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MAELOR WORKS, WREXHAM**

Appendix VII Trial Pit, Borehole and Groundwater Monitoring Well Logs (2011)



MONITORING WELL LOG

MW11-01

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 01/06/11

EASTING: 338182.73

SITE: Maelor Works, Wrexham

LOGGED BY: Chris Meakin

NORTHING: 348254.05

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 33.40 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
	0.45 mbgl on 01/06/11 								
		0.3 m			0.20	MADE GROUND Concrete.	0.0 ppm	MW11-1/1	0.2 - 0.3 m
		0.5 m			0.35	MADE GROUND Light brown sandy rounded to sub-rounded fine to coarse gravel of flint with occasional flint cobbles and pebbles.			
					0.60	MADE GROUND Soft light brown fine to coarse sandy clay with rare sub-rounded to rounded fine gravel of flint.			
1						GLACIAL TILL Firm becoming stiff brown CLAY with occasional pockets of light grey mottling.	0.0 ppm	MW11-1/2	1.0 - 1.1 m
2					1.80				
						GLACIAL TILL Firm brown CLAY with rare grey/black staining/mottling.			
						Poor core recovery from 3.0 - 4.0 mbgl.			
3							0.0 ppm	MW11-1/3	2.8 - 3.0 m
4		4.0 m			4.10	End of borehole.			
		4.5 m				4.1 m			
5									

NOTES

Located on gasholder base.

Descriptions are based on observations and hand testing of grab samples.
Mechanical tests were not performed unless otherwise stated.

 Water Strike
 Rest Groundwater Level

Drilling Method: Fraste Multi Drill

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-02

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 01/06/11

EASTING: 338038.18

SITE: Maelor Works, Wrexham

LOGGED BY: Chris Meakin

NORTHING: 348197.89

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 36.97 mAO

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
						MADE GROUND Dry brown sandy angular to sub-angular fine to coarse gravel of concrete, brick, sandstone, limestone and tarmac.	0.0 ppm	MW11-02/1	0.1 - 0.2 m
					0.30 0.35	MADE GROUND Tarmac.			
		0.5 m				MADE GROUND Brown/black clayey gravel with some sand. Gravel is fine to coarse of tarmac, brick, concrete, limestone and sandstone.			
		0.7 m			0.70	MADE GROUND Soft brown/black gravelly sandy clay. Gravel is fine to coarse of tarmac, brick, concrete, limestone and sandstone. Damp at 0.9 mbgl, wet from 1 - 1.2 mbgl.	0.0 ppm	MW11-02/2	1.0 - 1.2 m
1					1.20	MADE GROUND Concrete.			
					1.30	MADE GROUND Loose angular to rounded medium coarse gravel of limestone, mudstone, tarmac, concrete and flint.			
					2.20	MADE GROUND Concrete.			
					2.35	MADE GROUND Loose angular to rounded medium coarse gravel of limestone, mudstone, tarmac, concrete and flint.			
					2.95 3.00	MADE GROUND Concrete.			
3						GLACIAL TILL Loose brown very fine well sorted GRAVEL.			
					3.50	GLACIAL TILL Firm brown with grey mottling sandy CLAY.			
					3.70	GLACIAL TILL Loose brown fine to medium SAND (wet).			
4					4.40	GLACIAL TILL Loose brown fine to medium SAND with occasional rounded to sub-rounded cobbles and pebbles of flint.	0.0 ppm	MW11-02/3	4.0 - 4.1 m
		4.7 m			4.70	Borehole terminated - kept collapsing.			
5						4.7 m			

NOTES

Located on purifier base.
No groundwater strike.

Descriptions are based on observations and hand testing of grab samples.
Mechanical tests were not performed unless otherwise stated.

☐ Water Strike
☒ Rest Groundwater Level

Drilling Method: Fraste Multi Drill

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-03

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 23/05/11

EASTING: -

SITE: Maelor Works, Wrexham

LOGGED BY: Alan Smith

NORTHING: -

CLIENT: NGPH

CONTRACTOR: OSDS

ELEVATION: -

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
						MADE GROUND Grass over: Loose brown slightly gravelly sand with rare crushed red brick.			
1					1.50			MW11-03/1	0.4 m
						End of borehole.			
						1.5 m			
2									
3									

NOTES

 Located in vicinity of former unidentified structure.
 Borehole not installed as MW99-103 located nearby.

 Descriptions are based on observations and hand testing of grab samples.
 Mechanical tests were not performed unless otherwise stated.

 Water Strike
 Rest Groundwater Level

Drilling Method: Vacuum Extraction

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.



MONITORING WELL LOG

MW11-05

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 25/05/11 & 08/06/11

EASTING: 338000.05

SITE: Maelor Works, Wrexham

LOGGED BY: Alan Smith

NORTHING: 348108.58

CLIENT: NGPH

CONTRACTOR: OSDS/CC Ground Investigations

ELEVATION: 36.76 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
						MADE GROUND Grey slightly sandy gravel with occasional cobble. Gravel is sub-angular medium to coarse.			
		0.8 m							
1		1.0 m							
					1.50				
						MADE GROUND Grey occasionally black slightly clayey sandy gravel. Gravel is medium to coarse of flint and limestone. Slight hydrocarbon odour emanating from base.			
2									
							0 ppm	MW11-05/1	2.4 - 2.5 m
3									
4									
		4.5 m			4.60				
		4.8 m			4.80	MADE GROUND Concrete base.			
						End of borehole.			
5						4.8 m			

NOTES

Located within remediation area A and in the vicinity of former effluent, tar and liquor tanks with detarrer and scrubbers.

Descriptions are based on observations and hand testing of grab samples.
Mechanical tests were not performed unless otherwise stated.

▽ Water Strike
▼ Rest Groundwater Level

Drilling Method: Vacuum Extraction/Fraste Multi Drill
Borehole Diameter: 85 mm
Screen Material: HDPE
Screen Diameter: 50 mm
Screen Slot Size: 0.75 mm
Sand Particle Size: 1 - 2 mm
All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-06

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 09/06/11

EASTING: 338007.23

SITE: Maelor Works, Wrexham

LOGGED BY: Alan Smith

NORTHING: 348099.14

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 36.63 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
					0.10	MADE GROUND Compacted gravels.			
						MADE GROUND Firm grey/brown sandy gravel. Gravel is sub-angular medium to coarse of limestone, red brick and concrete. Large cobble ~ 0.5 m.	0.6 ppm	MW11-06/1	0.4 m
		0.8 m			0.90				
1		1.0 m				GLACIAL TILL Damp loose brown slightly gravelly SAND.	0.6 ppm	MW11-06/2	1.1 m
					2.35				
					2.60	GLACIAL TILL Grey/black sandy sub-rounded to sub-angular medium GRAVEL of flint.			
		2.7 m				GLACIAL TILL (BOULDER CLAY) Firm to stiff orange/brown CLAY.	1.4 ppm	MW11-06/3	2.7 - 2.8 m
					3.60				
		3.6 m				End of borehole.			
						3.6 m			
4									

NOTES

Located in the vicinity of former cooling tower and south of remediation area A.

 Descriptions are based on observations and hand testing of grab samples.
 Mechanical tests were not performed unless otherwise stated.

 ▽ Water Strike
 ▼ Rest Groundwater Level

Drilling Method: Fraste Multi Drill

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

PROJECT No: 50065-29

DATE: 26/05/11 & 14/06/11

EASTING: 337992.51

SITE: Maelor Works, Wrexham

LOGGED BY: Alan Smith

NORTHING: 348052.40

CLIENT: NGPH

CONTRACTOR: OSDS/CC Ground Investigations

ELEVATION: 36.88 mAOD

[illegible]

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

▽ Water Strike
▼ Rest Groundwater Level

Drilling Method: Fraste Multi Drill
Borehole Diameter: 85 mm
Screen Material: HDPE
Screen Diameter: 50 mm
Screen Slot Size: 0.75 mm
Sand Particle Size: 1 - 2 mm

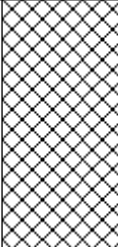
All depths shown in metres below ground level.

BOREHOLE LOG

MW11-08A

Sheet 1 of 1

PROJECT No: 50065-29 SITE: Maelor Works, Wrexham CLIENT: NGPH	DATE: 25/05/11 LOGGED BY: Alan Smith CONTRACTOR: OSDS	EASTING: 338020.74 NORTHING: 348049.73 ELEVATION: 36.86 mAOD
--	--	---

mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID (ppm)	SAMPLE	
		LEGEND	DEPTH			LABEL	DEPTH
			0.50	MADE GROUND Loose grey limestone gravel over: Grey/black sandy gravel. Gravel is sub-angular fine to medium of limestone and ash.		MW11-08/1	0.2 m
			0.70	MADE GROUND Black sandy gravel of ash with occasional cobble of red brick. Hydrocarbon odour.		MW11-08/2	0.6 m
				Borehole terminated - concrete encountered. 0.7 m			
1							
2							
3							

NOTES

Borehole moved as concrete encountered.
 (Referred to in laboratory reports as MW11-08).

Descriptions are based on observations and hand testing of grab samples.

 Water Strike
 Rest Groundwater Level

All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-08B

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 14/06/11

EASTING: 338020.74

SITE: Maelor Works, Wrexham

LOGGED BY: Natasha Glynn

NORTHING: 348049.73

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 36.86 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
					0.10	MADE GROUND			
					0.15	Limestone chippings.			
		0.3 m				MADE GROUND			
						Red brick tile.			
		0.5 m				MADE GROUND			
						Concrete.			
					0.70				
						GLACIAL TILL			
						Wet loose brown sandy slightly clayey sub-rounded to sub-angular			
						GRAVEL of sandstone/mudstone. Strong hydrocarbon odour and			
						black staining - oily sheen on groundwater.			
					1.60				
						GLACIAL TILL (BOULDER CLAY)			
						Firm orange/brown CLAY.			
		2.0 m							
		2.2 m							
					2.70				
		2.7 m				End of borehole.			
						2.7 m			

NOTES

Water at 1.4 mbgl stained black with oily sheen - strong hydrocarbon odour.

 Descriptions are based on observations and hand testing of grab samples.
 Mechanical tests were not performed unless otherwise stated.

 ▽ Water Strike
 ▼ Rest Groundwater Level

Drilling Method: Fraste Multi Drill

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-10

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 15/06/11

EASTING: 338122.66

SITE: Maelor Works, Wrexham

LOGGED BY: Natasha Glynn

NORTHING: 347956.59

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 35.43 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
0.5 mbgl on 15/06/11 ▼		0.1 m			0.50	MADE GROUND Re-inforced concrete.			
					0.70	GLACIAL TILL Brown slightly clayey sandy GRAVEL. Gravel is sub-angular to sub-rounded fine to medium.			
		0.7 m				GLACIAL TILL Firm red/brown CLAY. End of borehole.			
						0.7 m			
1									
2									
3									

NOTES

 No sample taken from borehole due to rapid ingress of water.
 Tried to bail and pump dry with no success.

 Descriptions are based on observations and hand testing of grab samples.
 Mechanical tests were not performed unless otherwise stated.

 ▼ Water Strike
 ▼ Rest Groundwater Level

Drilling Method: Hand Dug

Borehole Diameter: -

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

BOREHOLE LOG

MW11-10B

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 15/06/11

EASTING: 338122.66

SITE: Maelor Works, Wrexham

LOGGED BY: Natasha Glynn

NORTHING: 347956.59

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 35.43 mAOD

mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID (ppm)	SAMPLE	
		LEGEND	DEPTH			LABEL	DEPTH
			0.10	TOPSOIL Loose orange brown slightly gravelly sandy clay with frequent rootlets and wood fragments. End of borehole.		MW11-10B/1	0.0 - 0.1 m
				0.1 m			
1							
2							

NOTES

Hand dug pit.
Sample collected from grass bank.

Descriptions are based on observations and hand testing of grab samples.

 Water Strike Rest Groundwater Level

All depths shown in metres below ground level.

PROJECT No: 50065-29

DATE: 03/06/11

EASTING: 338116.61

SITE: Maelor Works, Wrexham

LOGGED BY: Chris Meakin

NORTHING: 348027.52

CLIENT: NGPH

CONTRACTOR: OSDS/CC Ground Investigations

ELEVATION: 36.91 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
	0.5 mbgl on 03/06/11 					MADE GROUND Concrete with blue sheeting beneath.			
		0.3 m			0.20	MADE GROUND Brown angular fine to coarse gravel. Wet.			
		0.5 m			0.40	MADE GROUND Concrete.			
					0.60	MADE GROUND Concrete.			
					0.70	MADE GROUND Dark brown/black fine sandy gravel of concrete, slag, sandstone, limestone and flint. Wet.	0.0 ppm	MW11-11/1	0.6 - 0.7 m
					0.80	MADE GROUND Dark brown/black fine sandy gravel of concrete, slag, sandstone, limestone and flint. Wet.			
1					1.10	Water ingress @ 0.6 - 0.7 mbgl with water rising to 0.5 mbgl.	0.0 ppm	MW11-11/2	0.9 - 1.0 m
					1.40	MADE GROUND Brown wet fine to coarse clayey sand with occasional coarse gravel of brick.			
						GLACIAL TILL Brown damp fine to coarse SAND.			
						GLACIAL TILL Brown damp/wet sandy CLAY with occasional fine to coarse gravel of flint.			
2					1.90	GLACIAL TILL Brown/black damp/wet sandy CLAY with occasional fine to coarse gravels of flint and some silt.			
					2.00	GLACIAL TILL Brown/black damp/wet sandy CLAY with occasional fine to coarse gravels of flint and some silt.			
						GLACIAL TILL Brown/grey soft damp clayey SAND.			
						GLACIAL TILL (BOULDER CLAY) Firm to stiff brown with occasional grey mottling CLAY. Showing laminations from 3.0 mbgl.	0.0 ppm	MW11-11/3	2.3 - 2.4 m
3									
		3.5 m							
4									
5		5.1 m			5.10	End of borehole.			
						5.1 m			

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

▽ Water Strike
▼ Rest Groundwater Level

Drilling Method: Fraste Multi Drill
Borehole Diameter: 85 mm
Screen Material: HDPE
Screen Diameter: 50 mm
Screen Slot Size: 0.75 mm
Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-12

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 19/05/11 & 13/06/11

EASTING: 338160.71

SITE: Maelor Works, Wrexham

LOGGED BY: Alan Smith/Alex Taylor

NORTHING: 348098.25

CLIENT: NGPH

CONTRACTOR: OSDS/CC Ground Investigations

ELEVATION: 36.77 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
					0.05	MADE GROUND Tarmac.			
						MADE GROUND Concrete hardstanding with rebar.			
1					1.00				
		1.1 m			1.20	GLACIAL TILL Light brown sandy CLAY. Sand is fine to medium.		MW11-12/1	1.0 - 1.2 m
		1.3 m				GLACIAL TILL Light brown fine to coarse SAND. No visual or olfactory signs of contamination.			
					2.00				
2					2.20	GLACIAL TILL Damp light brown slightly clayey sandy GRAVEL. Sand is fine to medium. Gravel is sub-angular fine to medium of mudstone and sandstone.			
					2.30	GLACIAL TILL Damp light brown slightly gravelly sandy CLAY. Gravel is sub-angular fine to medium of sandstone and mudstone.		MW11-12/2	2.3 - 3.3 m
						GLACIAL TILL Light brown slightly clayey SANDY GRAVEL of sandstone and mudstone.			
					3.30				
3		3.3 m				GLACIAL TILL (BOULDER CLAY) Wet firm slightly sandy gravelly CLAY. Gravel is rounded fine to medium of mudstone and sandstone.		MW11-12/3	3.4 - 3.6 m
					4.10				
4		4.2 m			4.20	GLACIAL TILL Dense light brown clayey fine to medium SAND.			
						End of borehole.			
						4.2 m			

NOTES

 Descriptions are based on observations and hand testing of grab samples.
 Mechanical tests were not performed unless otherwise stated.

 ▽ Water Strike
 ▼ Rest Groundwater Level

 Drilling Method: Diamond Cutter/Fraste Multi Drill
 Borehole Diameter: 85 mm
 Screen Material: HDPE
 Screen Diameter: 50 mm
 Screen Slot Size: 0.75 mm
 Sand Particle Size: 1 - 2 mm
 All depths shown in metres below ground level.

MONITORING WELL LOG

MW11-13

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 06/06/11

EASTING: 338199.94

SITE: Maelor Works, Wrexham

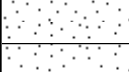
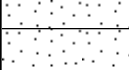
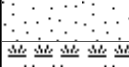
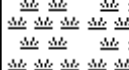
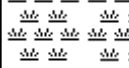
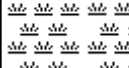
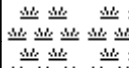
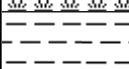
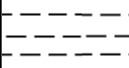
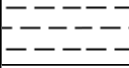
LOGGED BY: Alan Smith

NORTHING: 348026.23

CLIENT: NGPH

CONTRACTOR: CC Ground Investigations

ELEVATION: 36.42 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
1					0.10	MADE GROUND Surface gravel dressing.	1.0 ppm	MW11-13/1	0.1 m
					0.30	MADE GROUND Dense brown/black slightly clayey sandy gravel. Gravel is angular to sub-angular fine to coarse of brick, coal, concrete and limestone.			
						MADE GROUND Dense brown slightly clayey sandy gravel. Gravel is angular to sub-angular fine to coarse of brick, coal, concrete and limestone.			
						GLACIAL TILL Brown SAND with occasional sub-rounded to rounded gravel of flint.			
2					1.00				
						GLACIAL TILL Brown SAND with some clay and occasional sub-rounded to rounded gravel of flint. Wet from 1.4 - 1.5 mbgl.			
					1.50		0.0 ppm	MW11-13/2	1.4 - 1.5 m
3						GLACIAL TILL Brown slightly gravelly SAND.			
					1.90				
						GLACIAL TILL Black/brown slightly gravelly sandy PEAT with pseudo-fibrous lenses.	0.7 ppm	MW11-13/3	2.1 m
4									
									
									
5									
									
									
6									
									
									
7									
									
									
8									



MONITORING WELL LOG

MW11-16

Sheet 1 of 1

PROJECT No: 50065-29

DATE: 01/06/11

EASTING: 338081.52

SITE: Maelor Works, Wrexham

LOGGED BY: Chris Meakin

NORTHING: 348263.91

CLIENT: NGPH

CONTRACTOR: OSDS/CC Ground Investigations

ELEVATION: 36.38 mAOD

mbgl	WATER LEVEL	WELL		LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	DETAIL	LEGEND	DEPTH			LABEL	DEPTH
1					0.10	MADE GROUND Brown gravelly clay. Gravel is angular fine to coarse of limestone, sandstone, flint and clinker.	0.0 ppm	MW11-16/1	0.5 - 0.6 m
					0.40	MADE GROUND Tarmac.			
					0.60	MADE GROUND Brown slightly sandy clayey gravel. Gravel is angular to sub-angular fine to coarse of limestone, flint and clinker.			
					1.00	MADE GROUND Light grey sandy gravel of limestone with some ash and clinker, occasional concrete and brick cobbles and rare suspected asbestos tile.			
					1.30	MADE GROUND Brown sandy gravel of brick, concrete, limestone, occasional tarmac, sandstone and some clinker.			
					1.90	MADE GROUND Soft brown sandy gravelly clay with occasional concrete and tarmac cobbles. Gravel is angular to sub-angular fine to coarse of concrete, sandstone and tarmac.			
2						@ 1.8 mbgl, blue plastic sheeting.	0.0 ppm	MW11-16/2	1.5 - 1.6 m
						No recovery.			
					2.70				
3		2.8 m				GLACIAL TILL Soft to firm light brown CLAY with occasional minor grey mottling and rare rootlets. Natural black staining from 2.7 - 2.9 mbgl.	0.0 ppm	MW11-16/3	4.0 - 4.1 m
		3.0 m			3.20	GLACIAL TILL Soft grey/light brown sandy CLAY. Sand is fine.			
					3.80	GLACIAL TILL Loose grey/light brown fine to medium SAND.			
4		4.0 m			4.15	GLACIAL TILL Firm to stiff brown CLAY with rare grey mottling.	0.0 ppm	MW11-16/3	4.0 - 4.1 m
		4.2 m			4.90				
5		4.9 m				End of borehole.			
						4.9 m			

NOTES

Borehole terminated at 4.9 mbgl, collapsed to 4.2 mbgl.
No groundwater strike.

Descriptions are based on observations and hand testing of grab samples.
Mechanical tests were not performed unless otherwise stated.

☐ Water Strike
▼ Rest Groundwater Level

Drilling Method: Fraste Multi Drill

Borehole Diameter: 85 mm

Screen Material: HDPE

Screen Diameter: 50 mm

Screen Slot Size: 0.75 mm

Sand Particle Size: 1 - 2 mm

All depths shown in metres below ground level.



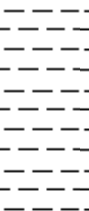
TRIAL PIT TP11-01



WorleyParsons
resources & energy

PROJECT No:50065-29			DATE: 21/06/11			EASTING:338169.6			
SITE: Maelor Works, Wrexham			LOGGED BY: Alex Taylor			NORTHING:348126.9			
CLIENT:NGPH			CONTRACTOR:Harvey Plant Hire			ELEVATION:36.77 mAOD			
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE			
		DEPTH	LEGEND			LABEL	DEPTH		
0.5 mbgl on 21/06/11  1		0.05		MADE GROUND Tarmac.					
				MADE GROUND Concrete with rebar.					
		0.50		GLACIAL TILL Loose light grey slightly clayey gravelly fine to medium SAND. Gravel is sub-angular fine to medium of limestone and sandstone.				TP11-01/1	0.5 - 1.0 m
								TP11-01/2	0.5 - 1.0 m
		1.40		GLACIAL TILL Soft light grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub-angular fine to medium of limestone and sandstone.				TP11-01/7	1.5 - 2.0 m
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION				SURFACE AND SUBSURFACE STRUCTURES					
GENERAL NOTES									
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.									
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304				Reviewed By:		FILE:			
				First Occurrence of Groundwater 					
				Static Water Level 					



PROJECT No: 50065-29				DATE: 21/06/11		EASTING: 338169.6	
SITE: Maelor Works, Wrexham				LOGGED BY: Alex Taylor		NORTHING: 348126.9	
CLIENT: NGPH				CONTRACTOR: Harvey Plant Hire		ELEVATION: 36.77 mAOD	
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	LEGEND			LABEL	DEPTH
2	2.8 mbgl on 21/06/11	2.80		GLACIAL TIL (BOULDER CLAY) Firm light brown slightly sandy CLAY. Sand is fine to medium.		TP11-01/3	1.4 - 2.0 m
						TP11-01/4	1.4 - 2.0 m
						TP11-01/5	2.8 - 2.9 m
						TP11-01/6	2.8 - 2.9 m
3	2.90			End of borehole.			
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION					SURFACE AND SUBSURFACE STRUCTURES		
GENERAL NOTES							
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.							
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304					Reviewed By:		
					FILE:		



TRIAL PIT TP11-05



WorleyParsons
resources & energy

PROJECT No:50065-29			DATE: 15/06/11			EASTING:338087.3		
SITE:Maelor Works, Wrexham			LOGGED BY:Alex Taylor			NORTHING:348046.0		
CLIENT:NGPH			CONTRACTOR:Harvey Plant Hire			ELEVATION:36.86 mAOD		
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE		
		DEPTH	LEGEND			LABEL	DEPTH	
1	1.0 mbgl on 15/06/11 			MADE GROUND Tarmac				
		0.40		MADE GROUND Limestone chippings.				
		0.50		MADE GROUND Brick tile floor.				
				MADE GROUND Concrete with rebar.				
		1.00						
				GLACIAL TILL Soft grey sandy CLAY. Sand is fine to medium.				
		1.40						
				GLACIAL TILL Soft brown slightly clayey sandy sub-rounded fine to coarse GRAVEL of sandstone and mudstone. Sand is fine to medium.				
								
								
2								
3								
2.9 m								
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION					SURFACE AND SUBSURFACE STRUCTURES			
GENERAL NOTES								
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.					First Occurrence of Groundwater  Static Water Level 			
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304					Reviewed By:		FILE:	



TRIAL PIT TP11-06A

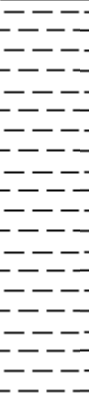
PROJECT No: 50065-29				DATE: 19/05/11		EASTING: 338151.5	
SITE: Maelor Works, Wrexham				LOGGED BY: Alan Smith		NORTHING: 348037.0	
CLIENT: NGPH				CONTRACTOR: OSDS		ELEVATION: 36.80 mAOD	
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	LEGEND			LABEL	DEPTH
		0.17		MADE GROUND Concrete.			
		0.40		MADE GROUND Gravel sub-base.			
		0.63		MADE GROUND Concrete.			
		Borehole terminated - metal pipe encountered.					
				0.63 m			
1							
2							
3							
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION				SURFACE AND SUBSURFACE STRUCTURES			
GENERAL NOTES							
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.				First Occurrence of Groundwater ☐ Static Water Level ☐			
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304				Reviewed By:		FILE:	



TRIAL PIT TP11-06B



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PROJECT No:50065-29				DATE: 17/06/11		EASTING:338151.5	
SITE: Maelor Works, Wrexham				LOGGED BY: Alex Taylor		NORTHING:348037.0	
CLIENT:NGPH				CONTRACTOR:Harvey Plant Hire		ELEVATION:36.80 mAOD	
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	LEGEND			LABEL	DEPTH
0.7 mbgl on 17/06/11 		0.15		MADE GROUND Concrete.		TP11-06/1	0.3 - 0.6 m
		0.30		MADE GROUND Dense beige sandy fine to coarse gravel of limestone chippings and bricks (sub-base). Sand is fine to medium.			
		0.60		MADE GROUND Dense grey to black sandy gravel. Sand is fine to medium. Gravel is sub-angular fine to coarse of clinker, brick and concrete.			
				GLACIAL TILL Firm light brown very sandy CLAY. Sand is fine to medium.			
		1.90		GLACIAL TILL Damp loose grey to light brown clayey fine to medium SAND.			
2.10							
2.30		GLACIAL TILL (BOULDER CLAY) Firm red/brown slightly sandy CLAY. Sand is fine to medium.					
				End of borehole.			
				2.3 m			
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION				SURFACE AND SUBSURFACE STRUCTURES			
GENERAL NOTES							
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.				First Occurrence of Groundwater  Static Water Level 			
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304				Reviewed By:		FILE:	



TRIAL PIT TP11-07



WorleyParsons
resources & energy

PROJECT No: 50065-29				DATE: 17/05/11, 15/06/11		EASTING: 338038.3	
SITE: Maelor Works, Wrexham				LOGGED BY: Alan Smith/Alex Taylor		NORTHING: 347960.7	
CLIENT: NGPH				CONTRACTOR: OSDS/Harvey Plant Hire		ELEVATION: 37.12 mAOD	
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	LEGEND			LABEL	DEPTH
1 <							



TRIAL PIT TP11-08



WorleyParsons
resources & energy

PROJECT No:50065-29				DATE: 18/05/11 & 17/06/11		EASTING:338126.7	
SITE: Maelor Works, Wrexham				LOGGED BY: Alan Smith/Alex Taylor		NORTHING:348072.4	
CLIENT:NGPH				CONTRACTOR:OSDS/Harvey Plant Hire		ELEVATION:36.82 mAOD	
mbgl	WATER LEVEL	LITHOLOGY		DESCRIPTION	PID	SAMPLE	
		DEPTH	LEGEND			LABEL	DEPTH
1.8 mbgl on 18/05/11 		0.10		MADE GROUND Tarmac hardstanding.		TP11-08/1	0.3 m
		0.20		MADE GROUND Loose grey/brown slightly sandy gravel. Gravel is sub-angular fine to medium limestone and brick.			
				MADE GROUND Loose black/grey sandy angular to sub-angular fine to medium gravel of limestone, brick and clinker. Sand is fine, ashy.			
		0.70		GLACIAL TILL Light brown slightly gravelly clayey fine to medium SAND. Gravel is sub-rounded fine to medium of mudstone and sandstone. @ 1.4 - 1.6 mbgl sloping concrete slabs (possible settling tank structure) located in east of trial pit.		TP11-08/5	1.0 - 1.5 m
	1						
		1.90		GLACIAL TILL Grey/black sandy sub-rounded fine to coarse GRAVEL of mudstone and sandstone. Sand is fine to medium. Slight hydrocarbon odour.		TP11-08/2 TP11-08/3 TP11-08/4	1.9 - 2.1 m 1.9 - 2.1 m 2.1 - 2.2 m
	2	2.10					
		2.20					
			GLACIAL TILL (BOULDER CLAY) Firm red/brown slightly sandy CLAY. Sand is fine to medium. End of borehole.				
				2.2 m			
SUMMARY OF VISUAL AND OLFACTORY CONTAMINATION					SURFACE AND SUBSURFACE STRUCTURES		
GENERAL NOTES							
Descriptions are based on observation and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.					First Occurrence of Groundwater  Static Water Level 		
3-8 Redcliffe Parade West, Bristol BS1 6SP. Tel. (0117) 925-1304					Reviewed By:		FILE:



WorleyParsons

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EcoNomics

**NATIONAL GRID PROPERTY HOLDINGS LTD
ENVIRONMENTAL ASSESSMENT SITE INVESTIGATION REPORT
MAELOR WORKS, WREXHAM**

Appendix VIII Soil, Leachate and Groundwater Analytical Results (2011)

NG 2007 PROFORMA FOR REPORTING ANALYTICAL RESULTS (WATER)							
All analytical results reported as mg/l ONLY							
Job Number: 644982							
Site Name: Quote 10587 - NGPH WATER SUITE							
Date: 02/11/2009							
Laboratory: Severn Trent Laboratories							
Date Sampled	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009
Time Sampled							
Laboratory Sample Reference	11444342	11444343	11444344	11444345	11444346	11444347	11444348
Trial Pit/ Borehole No.	Flo Gas	Switch Rm	Archives	EMS	Reception Kitchen	Amec	Mech Services
Sampling Depth (m)							
=====							
pH	8	7.8	8.9	8.1	7.9	7.8	7.8
TOC	2.1	2.22	2.2	1.45	17.7	2.47	2.59
Suspended Solids	2	8	15	<2	<2	<2	<2
Conductivity(us/cm)	200	200	210	200	200	200	200
Phenol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Catechol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Resorcinol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cresols	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Xylenols & Ethylphenols	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Naphthols	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Trimethylphenol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Phenols	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Naphthalene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acenaphthylene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acenaphthene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Phenanthrene	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001
Anthracene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluoranthene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Pyrene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)anthracene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Chrysene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Indeno(1,2,3-cd)pyrene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Di-benz(a,h)anthracene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total PAH	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Petroleum Hydrocarbons	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Easily-liberatable Cyanide	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Complex Cyanide	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Cyanide	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Thiocyanate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Elemental Sulphur							
Sulphate	31.8	168	37.1	31.9	39	32.3	26.2
Sulphide							
Chloride	0.0128	0.0144	0.0174	0.0194	0.0198	0.016	0.0145
Total Ammonium	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	<0.0003	0.0003	<0.0003	0.0005	<0.0003	<0.0003	0.0003
Chromium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	<0.002	0.002	<0.002	<0.002	0.003	<0.002	<0.002
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	<0.001	0.012	0.057	0.24	0.016	0.004	0.002
Nickel	<0.0009	<0.0009	<0.0009	0.0042	<0.0009	<0.0009	<0.0009
Zinc	0.033	0.061	0.047	0.65	0.08	0.064	0.22
Iron	0.04	<0.03	<0.03	<0.03	0.08	<0.03	<0.03

Key

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

M=MCERTS accreditation

NG 2007 PROFORMA FOR REPORTING ANALYTICAL RESULTS (WATER)							
All analytical results reported as mg/l ONLY							
Job Number: 644982							
Site Name: Quote 10587 - NGPH WATER SUITE							
Date: 02/11/2009							
Laboratory: Severn Trent Laboratories							
Date Sampled	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009	19/10/2009
Time Sampled							
Laboratory Sample Reference	11444342	11444343	11444344	11444345	11444346	11444347	11444348
Trial Pit/ Borehole No.	Flo Gas	Switch Rm	Archives	EMS	Reception Kitchen	Amec	Mech Services
Sampling Depth (m)							
=====							
Analytes below to be determined if their presence is suspected on site, or if specifically requested by consultant/con							
Cobalt							
Vanadium							
Molybdenum							
Germanium							
Hex Cr							
>C6 to C8 Aliphatic							
>C8 to C10 Aliphatic							
>C10 to C12 Aliphatic							
>C12 to C16 Aliphatic							
>C16 to C21 Aliphatic							
>C21 TO C40 Aliphatic							
Total Aliphatic							
>C5 to C7 Aromatic							
>C7 to C8 Aromatic							
>C8 to C10 Aromatic							
>C10 to C12 Aromatic							
>C12 to C16 Aromatic							
>C16 to C21 Aromatic							
>C21 TO C40 Aromatic							
Total Aromatic							
Total EPH aliphatic/Aromatic							
ICES7 PCB Congeners							
PCB 28							
PCB 52							
PCB 101							
PCB 118							
PCB 138							
PCB 153							
PCB 180							
ADDITIONAL ANALYTES							
Cyanide (Total)							
Phosphate as P, Soluble							
Pres Enterococcus faecalis (cfu/ml)							
Presumptive E.coli (cfu/ml)							
Total Coliform presum	0	0	0	0	0	0	0
Total Coliforms confirmed	0	0	0	0	0	0	0
TVC 22C 3 day	>1000	>1000	>1000	>1000	>1000	>1000	>1000
TVC 37C 2 day	208	>1000	>1000	715	>1000	>1000	169
Total Hardness as CaCO3	62	66	69	67	60	62	59
Sulphide as S	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Key

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

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Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81458

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81458

Amec W/Shop
Sink

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	None Detected
Total Coliforms AM149	per 100 ml	None Detected
Escherichia coli AM149	per 100 ml	None Detected

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to. The colony count excludes fungal organisms.

Signed for and on behalf of Exova (UK) Ltd.

A. Ballett
BSc (Hons)
Senior Microbiologist



0730

Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81461

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81461
Flogas Kitchen

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	None Detected
Total Coliforms AM149	per 100 ml	None Detected
Escherichia coli AM149	per 100 ml	None Detected

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to. The colony count excludes fungal organisms.

Signed for and on behalf of Exova (UK) Ltd.

A. Ballett
BSc (Hons)
Senior Microbiologist



0730

Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81460

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81460
Meter in

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	24
Total Coliforms AM149	per 100 ml	1
Escherichia coli AM149	per 100 ml	None Detected

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A. Ballett
BSc (Hons)
Senior Microbiologist



0730

Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81457

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81457

Red Brick 1st
Aid

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	None Detected
Total Coliforms AM149	per 100 ml	None Detected
Escherichia coli AM149	per 100 ml	None Detected

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to. The colony count excludes fungal organisms.

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A. Ballett
BSc (Hons)
Senior Microbiologist



0730

Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81456

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81456
Wales and
West Kirchen

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	None Detected
Total Coliforms AM149	per 100 ml	None Detected
Escherichia coli AM149	per 100 ml	None Detected

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to. The colony count excludes fungal organisms.

Signed for and on behalf of Exova (UK) Ltd.

A. Ballett
BSc (Hons)
Senior Microbiologist



0730

Exova
121 Shady Lane
Great Barr
Birmingham
West Midlands
B44 9ET
United Kingdom

T: +44 (0) 121 251 4000
F: +44 (0) 121 251 4040
E: birmingham@exova.com
W: www.exova.com



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 356676
Our Ref: 09L00836
Your Ref: **Water Routine**
Sample Ref: 38/81459

Order Ref: WFS PO 093809
Date Reported: 08 December 2009

CERTIFICATE OF ANALYSIS

Date Received: 03 December 2009
Marked: **National Grid**
Taken: by Dan Wills on 03/12/2009
With the following results:

38/81459

White Building
Sink

Colony Count 37°C 2 Days AM071	per ml	None Detected
Colony Count 22°C 3 Days AM071	per ml	None Detected
Total Coliforms AM149	per 100 ml	None Detected
Escherichia coli AM149	per 100 ml	None Detected

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to. The colony count excludes fungal organisms.

Signed for and on behalf of Exova (UK) Ltd.

A. Ballett
BSc (Hons)
Senior Microbiologist



0730



Bradford Laboratory, George Steet, Bradford. BD1 5AA. (UKAS Lab No. 0996)
Rotherham Laboratory, Mill Close, Rotherham. S60 1BZ. (UKAS Lab No. 2300)
Aspen Court Laboratory, 7 & 8 Aspen Court, Bessemer Way, Rotherham, S60 1FB (UKAS Lab No. 0996)
Langley Laboratory, Heron Drive, Langley, Slough. SL3 8XP (UKAS Lab No. 0996)
Bellshill Laboratory, Strathclyde Business Park, 2 Mallard Way, Bellshill ML4 3BF
Dublin Laboratory, Unit 18A, Rosemount Business Park, Ballycoolin, Dublin 11, (UKAS Lab No. 0996)
Telephone: 01709 841000 Fax: 01709 841079 E-mail: customer.services@alcontrol.com

Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
ST18 9AB

Sample Date : 24/05/2010
Sample Received : 25/05/2010
Analysis Completed : 01/06/2010

Batch Number : 8252158

Flogas Office Kitchen

Laboratory Number : 82510646

Method	Determination	Result	Units
BP50.15	Total coliforms	0	CFU/100ml
BP50.15	Escherichia coli	0	CFU/100ml
BP50.5	Colonies 2 day 37c	4	CFU/ml
BP50.5	Colonies 3 day 22c	3	CFU/ml

Approved By

Phil Slater (Operations Manager)
03/06/2010

Page 1 of 1

Tests marked \$ in this report are subcontracted. Method prefix denotes the Lab where the analysis has been performed, R = Rotherham Aspen Court, B = Rotherham Aspen Court, L = Langley, S = Bellshill, D = Dublin. Tests marked * in this report are not included in the UKAS Accreditation Schedule for our laboratory. Sampling, opinions and interpretations expressed herein are outside the scope of UKAS Accreditation. Method details and performance characteristics are available on request. < = Less than, > = greater than. For taste and odour: 1 = present, 0 = absent. # = Data supplied by client. For softened water supply minimum concentrations apply for hardness (60mg/l as Ca) and alkalinity (30mg/l as HCO₃). TVC results >300 and coliform, E. coli, Enterococci, Clostridia, Pseudomonas and Staphylococcus results >100 are regarded as estimates unless a dilution has been carried out.





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Dublin Laboratory, Unit 18A, Rosemount Business Park, Ballycoolin, Dublin 11, (UKAS Lab No. 0996)
Telephone: 01709 841000 Fax: 01709 841079 E-mail: customer.services@alcontrol.com

Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
ST18 9AB

Sample Date : 24/05/2010
Sample Received : 25/05/2010
Analysis Completed : 01/06/2010

Batch Number : 8252158

Maelor Main Office Kitchen

Laboratory Number : 82510644

Method	Determination	Result	Units
BP50.15	Total coliforms	0	CFU/100ml
BP50.15	Escherichia coli	0	CFU/100ml
BP50.5	Colonies 2 day 37c	152	CFU/ml
BP50.5	Colonies 3 day 22c	241	CFU/ml

Approved By

Phil Slater (Operations Manager)
03/06/2010

Page 1 of 1

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Bradford Laboratory, George Steet, Bradford. BD1 5AA. (UKAS Lab No. 0996)
Rotherham Laboratory, Mill Close, Rotherham. S60 1BZ. (UKAS Lab No. 2300)
Aspen Court Laboratory, 7 & 8 Aspen Court, Bessemer Way, Rotherham, S60 1FB (UKAS Lab No. 0996)
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Dublin Laboratory, Unit 18A, Rosemount Business Park, Ballycoolin, Dublin 11, (UKAS Lab No. 0996)
Telephone: 01709 841000 Fax: 01709 841079 E-mail: customer.services@alcontrol.com

Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
ST18 9AB

Sample Date : 24/05/2010
Sample Received : 25/05/2010
Analysis Completed : 01/06/2010

Batch Number : 8252158

Workshop Toilet

Laboratory Number : 82510647

Method	Determination	Result	Units
BP50.15	Total coliforms	0	CFU/100ml
BP50.15	Escherichia coli	0	CFU/100ml
BP50.5	Colonies 2 day 37c	0	CFU/ml
BP50.5	Colonies 3 day 22c	17	CFU/ml

Approved By

Phil Slater (Operations Manager)
03/06/2010

Page 1 of 1

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Dublin Laboratory, Unit 18A, Rosemount Business Park, Ballycoolin, Dublin 11, (UKAS Lab No. 0996)
Telephone: 01709 841000 Fax: 01709 841079 E-mail: customer.services@alcontrol.com

Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
ST18 9AB

Sample Date : 24/05/2010
Sample Received : 25/05/2010
Analysis Completed : 01/06/2010

Batch Number : 8252158

Western Gas Alliance Gent

Laboratory Number : 82510645

Method	Determination	Result	Units
BP50.15	Total coliforms	0	CFU/100ml
BP50.15	Escherichia coli	0	CFU/100ml
BP50.5	Colonies 2 day 37c	57	CFU/ml
BP50.5	Colonies 3 day 22c	34	CFU/ml

Approved By

Phil Slater (Operations Manager)
03/06/2010

Page 1 of 1

Tests marked \$ in this report are subcontracted. Method prefix denotes the Lab where the analysis has been performed, R = Rotherham Aspen Court, B = Rotherham Aspen Court, L = Langley, S = Bellshill, D = Dublin. Tests marked * in this report are not included in the UKAS Accreditation Schedule for our laboratory. Sampling, opinions and interpretations expressed herein are outside the scope of UKAS Accreditation. Method details and performance characteristics are available on request. < = Less than, > = greater than. For taste and odour: 1 = present, 0 = absent. # = Data supplied by client. For softened water supply minimum concentrations apply for hardness (60mg/l as Ca) and alkalinity (30mg/l as HCO₃). TVC results >300 and coliform, E. coli, Enterococci, Clostridia, Pseudomonas and Staphylococcus results >100 are regarded as estimates unless a dilution has been carried out.





Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 1
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 1

Customer: NG Maelor Engineering
Sample Description: AMEC Kitchen Cold
Date Sample Taken: 18/11/2010
LSN: 44/79485
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	1	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to.

All tests are carried out according to our schedule of accreditation unless marked.

Tests marked * are not accredited. Tests marked ‡ were sub contracted and are not accredited. Tests marked † were sub contracted and are accredited according to their schedule.

Comments, opinions and interpretations expressed herein are outside this current scope of UKAS accreditation.

Signed for and on behalf of Exova (UK) Ltd.

A handwritten signature in black ink, appearing to read "A. Ballett".

A. Ballett
BSc (Hons)
Senior Microbiologist



0730



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 1
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 1

Customer: NG Maelor Engineering
Sample Description: Flow GAS Sink
Date Sample Taken: 18/11/2010
LSN: 44/79486
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	None Detected	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to.

All tests are carried out according to our schedule of accreditation unless marked.

Tests marked * are not accredited. Tests marked ‡ were sub contracted and are not accredited. Tests marked † were sub contracted and are accredited according to their schedule.

Comments, opinions and interpretations expressed herein are outside this current scope of UKAS accreditation.

Signed for and on behalf of Exova (UK) Ltd.

A handwritten signature in black ink, appearing to read "A. Ballett".

A. Ballett
BSc (Hons)
Senior Microbiologist



0730



Client: Karen Dyer
Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 1
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 1

Customer: NG Maelor Engineering
Sample Description: Mech Work Shop Kitchen Cold

Date Sample Taken: 18/11/2010
LSN: 44/79488
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	10	per ml	
Colony Count 22°C 3 Days	AM071	15	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Results presented above are a measure of the quality of the water sample received (as is) by Exova. These results may not be a true measure of the quality of the sample at point of origin if prescribed sampling and transportation protocols have not been adhered to.

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Senior Microbiologist



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Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 5
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 2

Customer: NG Maelor Engineering
Sample Description: Training Ctr First Aid Cold
Date Sample Taken: 18/11/2010
LSN: 44/79484
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	3	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Customer: NG Maelor Engineering
Sample Description: AMEC Kitchen Cold
Date Sample Taken: 18/11/2010
LSN: 44/79485
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	1	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Customer: NG Maelor Engineering
Sample Description: Flow GAS Sink
Date Sample Taken: 18/11/2010
LSN: 44/79486
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	None Detected	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

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BSc (Hons)
Senior Microbiologist



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Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 5
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 2 of 2

Customer: NG Maelor Engineering
Sample Description: WW Kitchen Cold
Date Sample Taken: 18/11/2010
LSN: 44/79487
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	8	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

Customer: NG Maelor Engineering
Sample Description: Mech Work Shop Kitchen Cold
Date Sample Taken: 18/11/2010
LSN: 44/79488
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	10	per ml	
Colony Count 22°C 3 Days	AM071	15	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

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BSc (Hons)
Senior Microbiologist



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Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 1
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 1

Customer: NG Maelor Engineering
Sample Description: Training Ctr First Aid Cold
Date Sample Taken: 18/11/2010
LSN: 44/79484
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	3	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

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BSc (Hons)
Senior Microbiologist



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Client: Karen Dyer
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Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Certificate No.: 495656
Job Ref: 10K06790
Number Of Samples: 1
Date Received: 18/11/2010
Date Reported: 24/11/2010

CERTIFICATE OF ANALYSIS

Page 1 of 1

Customer: NG Maelor Engineering
Sample Description: WW Kitchen Cold
Date Sample Taken: 18/11/2010
LSN: 44/79487
Testing Commenced: 18/11/2010

Test Description	Method	Result	Unit	Est.
Colony Count 37°C 2 Days	AM071	8	per ml	
Colony Count 22°C 3 Days	AM071	None Detected	per ml	
Total Coliforms	AM149	None Detected	per 100 ml	
Escherichia coli	AM149	None Detected	per 100 ml	

Microbiologically Acceptable - PASS

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A. Ballett
BSc (Hons)
Senior Microbiologist



0730



Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Sample Date: 26-May-11
Received Date: 26-May-11
Test Date : 26-May-11
Certificate Ref: 14655-31/05/2011 15:24:39 (2)
Certificate ID: 41634
Order Number: WFSP0 154311
SDG Reference: WAT_STA 26-05-11 1
Laboratory Reference: WAT_STA[RM]83797

Sample : Amec Kitchen

Details : Maelor Engineering Workshop

Method Ref	Determination	Result	Units
BP50.15	Escherichia coli (P)	0	cfu/100ml
BP50.15	Total Coliforms	0	cfu/100ml
BP50.5	TVC (3 Days @ 22°C)	11	cfu/ml
BP50.5	TVC (2 Days @ 37°C)	46	cfu/ml

Approved By: Phil Slater(Lab Manager)

Date: 30-May-11

Page 1 of 1

Abbreviations: < = Less than, > = Greater than. SDG = Sample Delivery Group. The site of test is identified by DB = Dublin, LY = Langley, BH = Bellshill, which comprise the 0996 and 2300 groups. Method suffix denotes testing laboratory. Tests marked *, # or \$ in this report are not included in the ISO 17025 accreditation schedule for the UKAS testing laboratories 0996 and 2300. Those marked: * have not been subcontracted and are not accredited; # have been subcontracted and are ISO 17025 Accredited; \$ have been subcontracted and are not ISO 17025 accredited; Comments, opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. For softened water supply, minimum concentrations apply for hardness (60mg/l as Ca) and alkalinity (30mg/l as HCO₃). Method details and performance characteristics are available on request. Results identified by ~ have been estimated (counts on plates were outside statistical limits).



0996



Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Sample Date: 26-May-11
Received Date: 26-May-11
Test Date : 26-May-11
Certificate Ref: 14655-31/05/2011 15:24:39 (5)
Certificate ID: 41637
Order Number: WFSP0 154311
SDG Reference: WAT_STA 26-05-11 1
Laboratory Reference: WAT_STA[RM]83800

Sample : Flo Gas Kitchen

Details : Maelor Engineering Workshop

Method Ref	Determination	Result	Units
BP50.15	Escherichia coli (P)	0	cfu/100ml
BP50.15	Total Coliforms	0	cfu/100ml
BP50.5	TVC (3 Days @ 22°C)	0	cfu/ml
BP50.5	TVC (2 Days @ 37°C)	0	cfu/ml

Approved By: Phil Slater(Lab Manager)

Date: 30-May-11

Page 1 of 1

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0996



Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Sample Date: 26-May-11
Received Date: 26-May-11
Test Date : 26-May-11
Certificate Ref: 14655-31/05/2011 15:24:39 (1)
Certificate ID: 41633
Order Number: WFSP0 154311
SDG Reference: WAT_STA 26-05-11 1
Laboratory Reference: WAT_STA[RM]83796

Sample : Mechanical Workshop Kitchen

Details : Maelor Engineering Workshop

Method Ref	Determination	Result	Units
BP50.15	Escherichia coli (P)	0	cfu/100ml
BP50.15	Total Coliforms	0	cfu/100ml
BP50.5	TVC (3 Days @ 22°C)	215	cfu/ml
BP50.5	TVC (2 Days @ 37°C)	383	cfu/ml

Approved By: Phil Slater(Lab Manager)

Date: 30-May-11

Page 1 of 1

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0996



Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Sample Date: 26-May-11
Received Date: 26-May-11
Test Date : 26-May-11
Certificate Ref: 14655-31/05/2011 15:24:39 (3)
Certificate ID: 41635
Order Number: WFSP0 154311
SDG Reference: WAT_STA 26-05-11 1
Laboratory Reference: WAT_STA[RM]83798

Sample : Training 1st Aid

Details : Maelor Engineering Workshop

Method Ref	Determination	Result	Units
BP50.15	Escherichia coli (P)	0	cfu/100ml
BP50.15	Total Coliforms	0	cfu/100ml
BP50.5	TVC (3 Days @ 22°C)	0	cfu/ml
BP50.5	TVC (2 Days @ 37°C)	38	cfu/ml

Approved By: Phil Slater(Lab Manager)

Date: 30-May-11

Page 1 of 1

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0996



Certificate of Analysis

Water Facilities Services Ltd
Unit 6/7 Barn 8
Dunston Business Village
Stafford Road
Dunston
Staffordshire
ST18 9AB

Sample Date: 26-May-11
Received Date: 26-May-11
Test Date : 26-May-11
Certificate Ref: 14655-31/05/2011 15:24:39 (4)
Certificate ID: 41636
Order Number: WFSP0 154311
SDG Reference: WAT_STA 26-05-11 1
Laboratory Reference: WAT_STA[RM]83799

Sample : Wales + West Kitchen

Details : Maelor Engineering Workshop

Method Ref	Determination	Result	Units
BP50.15	Escherichia coli (P)	0	cfu/100ml
BP50.15	Total Coliforms	0	cfu/100ml
BP50.5	TVC (3 Days @ 22°C)	0	cfu/ml
BP50.5	TVC (2 Days @ 37°C)	440	cfu/ml

Approved By: Phil Slater(Lab Manager)

Date: 30-May-11

Page 1 of 1

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0996

Our Ref: EXR/121817 (Ver. 1)

Your Ref: 50065-29

July 1, 2011



Scientifics

Bretby Business Park

Ashby Road

Burton-on-Trent

Staffordshire

DE15 0YZ

Telephone: 01283 554400

Facsimile: 01283 554422

Ms N Glynn
Worley Parsons Komex
3 - 8 Redcliffe Parade West
Bristol
BS1 6SP

For the attention of Ms N Glynn

Dear Ms Glynn

LEACHATE SAMPLE ANALYSIS - Maelor Works

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Please be aware that from 1 January 2003 our policy for the retention of paper based laboratory records and analysis reports will be 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Scientifics) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for Scientifics

A handwritten signature in black ink, appearing to read "J Colbourne".

J Colbourne
Project Co-ordinator
01283 554547

TEST REPORT

LEACHATE SAMPLE ANALYSIS



Report No. EXR/121817 (Ver. 1)

Worley Parsons Komex
3 - 8 Redcliffe Parade West
Bristol
BS1 6SP

Site: Maelor Works

The 3 samples described in this report were logged for analysis by Scientifics on 24-Jun-2011. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 01-Jul-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PAH (MS-SIM) (10) Results (Pages 5 to 7)
GC-FID Chromatograms (Pages 8 to 10)
Analytical and Deviating Sample Overview (Pages 11 to 12)
Table of Method Descriptions (Page 13)
Table of Report Notes (Page 14)

On behalf of
Scientifics :
Andrew Timms

A handwritten signature in black ink, appearing to read 'Andrew Timms', is written over a faint, circular official stamp.

Operations Manager

Date of Issue: 01-Jul-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

[illegible]

[illegible]

[illegible]

Polycyclic Aromatic Hydrocarbons

GC/MS (SIM)

Customer and Site Details:	Worley Parsons Komex: Maelor Works		
Sample Details:	MW11-08B-1 0.7-1.4	Job Number:	W12_1817
LIMS ID Number:	EX1126082	Date Booked in:	24-Jun-11
QC Batch Number:	110574	Date Extracted:	28-Jun-11
Quantitation File:	Initial Calibration	Date Analysed:	29-Jun-11
Directory:	628PAH.MS10\	Matrix:	Leachate
Dilution:	1.0	Ext Method:	Sep. Funnel

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration ug/l	% Fit
Naphthalene	91-20-3	3.13	0.479	85
Acenaphthylene	208-96-8	4.17	1.360	87
Acenaphthene	83-32-9	4.29	13.700	97
Fluorene	86-73-7	4.66	1.980	99
Phenanthrene	85-01-8	5.46	1.090	99
Anthracene	120-12-7	5.51	0.320	98
Fluoranthene	206-44-0	6.75	0.116	97
Pyrene	129-00-0	7.03	0.119	95
Benzo[a]anthracene	56-55-3	8.69	0.029	54
Chrysene	218-01-9	8.73	0.014	71
Benzo[b]fluoranthene	205-99-2	-	< 0.010	-
Benzo[k]fluoranthene	207-08-9	-	< 0.010	-
Benzo[a]pyrene	50-32-8	-	< 0.010	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.010	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.010	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.010	-
Total (USEPA16) PAHs	-	-	< 19.267	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	99
Acenaphthene-d10	100
Phenanthrene-d10	99
Chrysene-d12	99
Perylene-d12	101

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	78
Terphenyl-d14	91

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons

GC/MS (SIM)

Customer and Site Details:	Worley Parsons Komex: Maelor Works		
Sample Details:	Report 121817 Blank	Job Number:	W12_1817
LIMS ID Number:	EX1126083	Date Booked in:	24-Jun-11
QC Batch Number:	110574	Date Extracted:	28-Jun-11
Quantitation File:	Initial Calibration	Date Analysed:	29-Jun-11
Directory:	628PAH.MS10\	Matrix:	Water
Dilution:	1.0	Ext Method:	Sep. Funnel

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration ug/l	% Fit
Naphthalene	91-20-3	-	< 0.010	-
Acenaphthylene	208-96-8	-	< 0.010	-
Acenaphthene	83-32-9	-	< 0.010	-
Fluorene	86-73-7	-	< 0.010	-
Phenanthrene	85-01-8	-	< 0.010	-
Anthracene	120-12-7	-	< 0.010	-
Fluoranthene	206-44-0	-	< 0.010	-
Pyrene	129-00-0	-	< 0.010	-
Benzo[a]anthracene	56-55-3	-	< 0.010	-
Chrysene	218-01-9	-	< 0.010	-
Benzo[b]fluoranthene	205-99-2	-	< 0.010	-
Benzo[k]fluoranthene	207-08-9	-	< 0.010	-
Benzo[a]pyrene	50-32-8	-	< 0.010	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.010	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.010	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.010	-
Total (USEPA16) PAHs	-	-	< 0.160	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	97
Acenaphthene-d10	96
Phenanthrene-d10	96
Chrysene-d12	94
Perylene-d12	99

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	83
Terphenyl-d14	95

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons

GC/MS (SIM)

Customer and Site Details: Worley Parsons Komex: Maelor Works
Sample Details: Report 121817 Blank Spike
LIMS ID Number: EX1126084
QC Batch Number: 110574
Quantitation File: Initial Calibration
Directory: 628PAH.MS10\
Dilution: 1000.0

Job Number: W12_1817
Date Booked in: 24-Jun-11
Date Extracted: 28-Jun-11
Date Analysed: 29-Jun-11
Matrix: Water
Ext Method: Sep. Funnel

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Recovery %	% Fit
Naphthalene	91-20-3	3.13	85	96
Acenaphthylene	208-96-8	4.17	79	99
Acenaphthene	83-32-9	4.29	81	99
Fluorene	86-73-7	4.66	77	96
Phenanthrene	85-01-8	5.46	83	99
Anthracene	120-12-7	5.51	83	98
Fluoranthene	206-44-0	6.75	88	82
Pyrene	129-00-0	7.03	82	74
Benzo[a]anthracene	56-55-3	8.68	97	97
Chrysene	218-01-9	8.73	88	94
Benzo[b]fluoranthene	205-99-2	10.19	81	77
Benzo[k]fluoranthene	207-08-9	10.23	84	65
Benzo[a]pyrene	50-32-8	10.61	83	77
Indeno[1,2,3-cd]pyrene	193-39-5	11.98	66	80
Dibenzo[a,h]anthracene	53-70-3	12.02	65	72
Benzo[g,h,i]perylene	191-24-2	12.27	83	73
Total (USEPA16) PAHs	-	-	1305	-

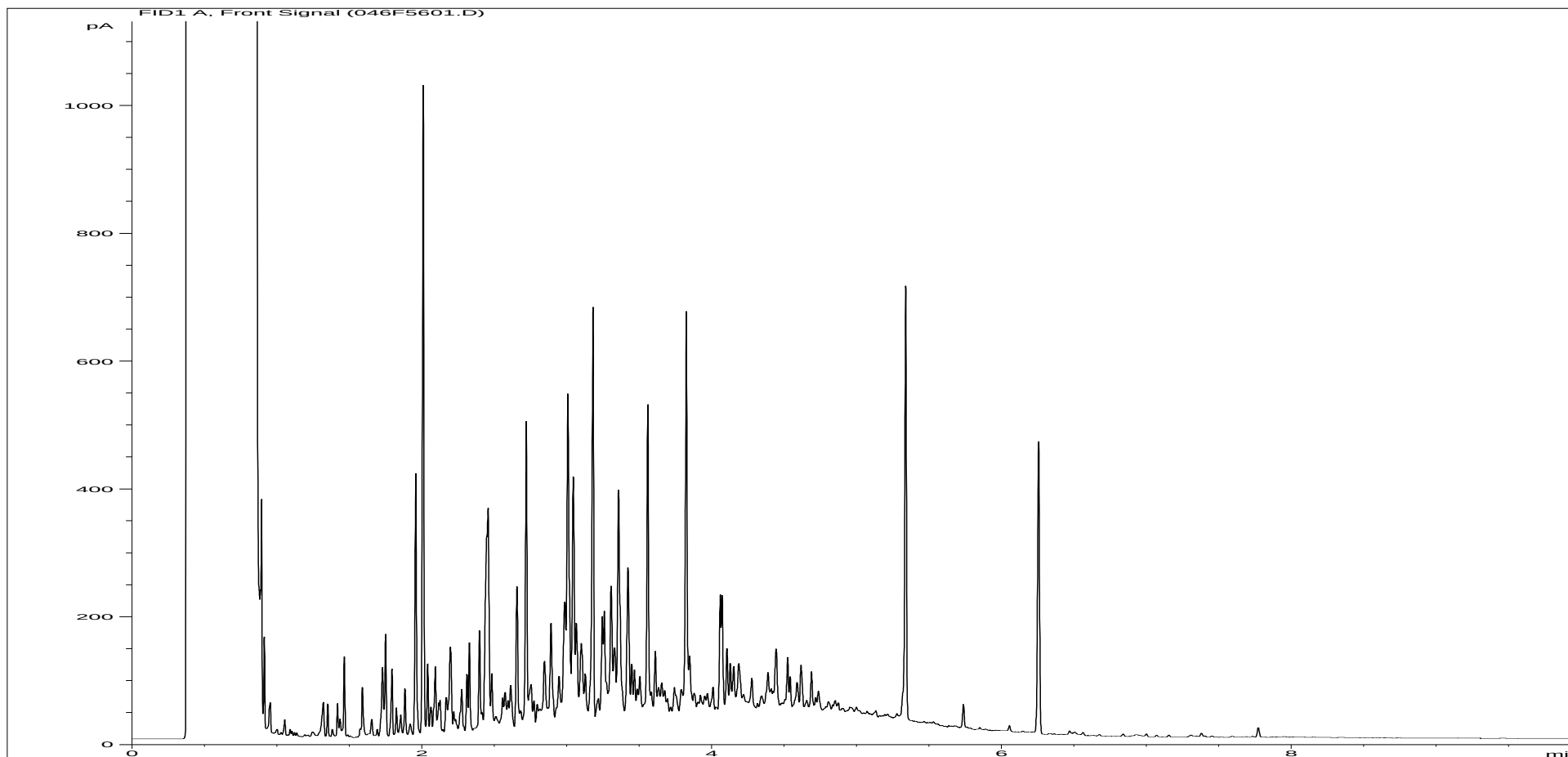
"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	101
Acenaphthene-d10	100
Phenanthrene-d10	101
Chrysene-d12	98
Perylene-d12	98

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	78
Terphenyl-d14	91

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

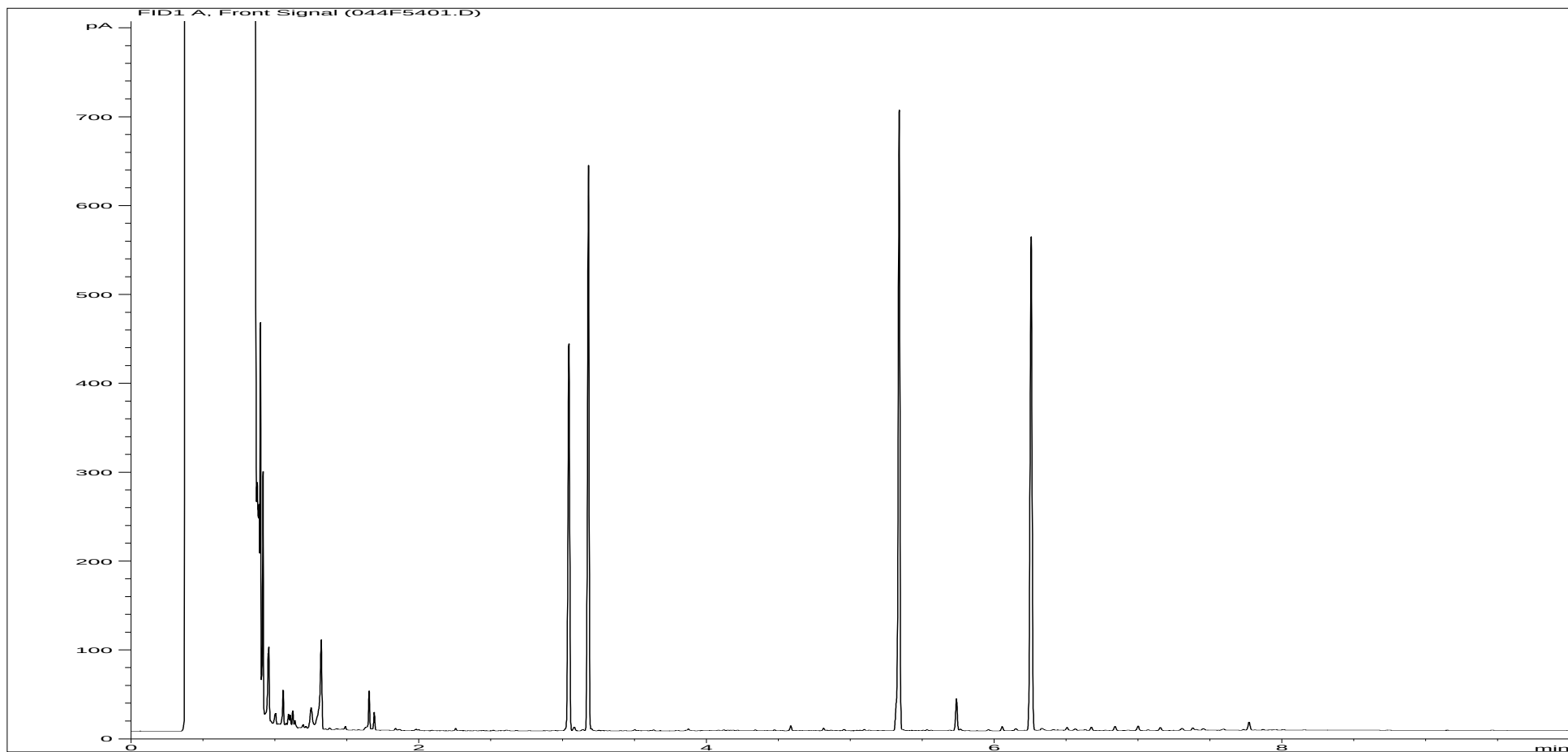
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1126082	Job Number:	W12_1817
Multiplier:	0.005	Client:	Worley Parsons Komex
Dilution:	1	Site:	Maelor Works
Acquisition Method:	TPH_RUNF.M	Client Sample Ref:	MW11-08B-1 0.7-1.4
Acquisition Date/Time:	29-Jun-11, 01:44:28		
Datafile:	D:\TES\DATA\Y2011\062811TPH_GC15\062811 2011-06-28 07-51-35\046F5601.D		

Where individual results are flagged see report notes for status.

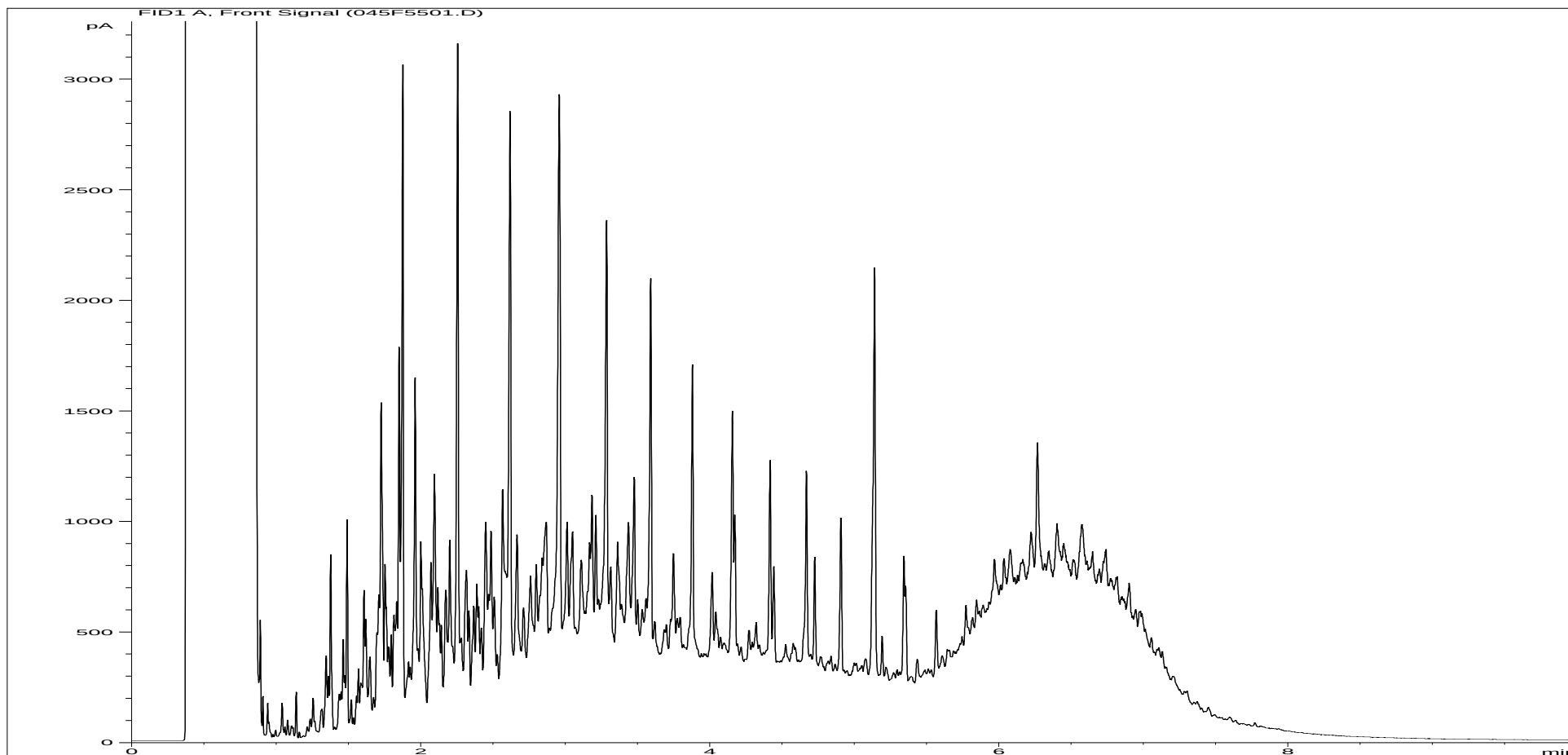
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1126083	Job Number:	W12_1817
Multiplier:	0.005	Client:	Worley Parsons Komex
Dilution:	1	Site:	Maelor Works
Acquisition Method:	TPH_RUNF.M	Client Sample Ref:	Report 121817 Blank
Acquisition Date/Time:	29-Jun-11, 01:10:29		
Datafile:	D:\TES\DATA\Y2011\062811\TPH_GC15\062811 2011-06-28 07-51-35\044F5401.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1126084	Job Number:	W12_1817
Multiplier:	0.005	Client:	Worley Parsons Komex
Dilution:	1	Site:	Maelor Works
Acquisition Method:	TPH_RUNF.M	Client Sample Ref:	Report 121817 Blank Spike
Acquisition Date/Time:	29-Jun-11, 01:27:28		
Datafile:	D:\TES\DATA\Y2011\062811\TPH_GC15\062811 2011-06-28 07-51-35\045F5501.D		

Where individual results are flagged see report notes for status.

Customer
Site
Report No

Worley Parsons Komex
Maelor Works
W121817

Consignment No
Date Logged 24-Jun-2011
Report Due 29-Jun-2011

		BTEX Analysis HSA MS							
TPHFID	TPH GC (0.01)	✓							
SFAS	Sulphide as S SFA	✓							
SFAPL	Complex Cyanide as CN (CALC)								
	Cyanide (Total) as CN SFA	✓							
	Cyanide (Free) as CN SFA	✓							
	Thiocyanate as SCN SFA	✓							
PHEHPLC	Phenol HPLC (Low)								
PAHMSW	PAH MS (16)	✓							
LeachPrep	Leachate Prep								
KONENS	Ammoniacal Nitrogen (Kone)	✓							
	Chloride as Cl (Kone)	✓							
ICPMATVAR	Iron as Fe (Dissolved) VAR	✓							
	Total Sulphur as SO4 (Diss) VAR	✓							
	Selenium as Se MS (Dissolved)	✓							
	Mercury as Hg MS (Dissolved)	✓							
	Arsenic as As MS (Dissolved)	✓							
	Zinc as Zn MS (Dissolved)	✓							
	Lead as Pb MS (Dissolved)	✓							
	Copper as Cu MS (Dissolved)	✓							
	Cadmium as Cd MS (Dissolved)	✓							
	Chromium as Cr MS (Dissolved)	✓							
	Nickel as Ni MS (Dissolved)	✓							
	GROHSA	GRO-HSA	✓						
CUSTSERV	Report B (CENC)								
ID Number	Description	MethodID	Sampled	Accredited to ISO17025					
				EX/1126082	MW11-08B-1 0.7-1.4	14/06/11			
				EX/1126083	Report 121817 Blank	14/06/11			
				EX/1126084	Report 121817 Blank Spike	14/06/11			

Note: For analysis where the Report Due date is greater than 7 days (Volatiles, PAH, Pesticides, PCB, Phenols, Herbicides) or 2 days (BOD) after the sampling date, although we will do our utmost to prioritise your samples, they may become deviant whilst being processed in the Laboratory.

In this instance, please contact the Laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A The sample was received in an inappropriate container for this analysis
B The sample was received without the correct preservation for this analysis
C Headspace present in the sample container
D The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E Sample processing did not commence within the appropriate holding time

Requested Analysis Key

Analysis Required

Analysis dependant upon trigger result - **Note: due date may be affected if triggered**

No analysis scheduled

Analysis Subcontracted

Customer
Site
Report No

Worley Parsons Komex
Maelor Works
W121817

Consignment No
Date Logged 24-Jun-2011
Report Due 29-Jun-2011

ID Number	Description	MethodID	WSLM13	WSLM2	WSLM3
		Sampled	Total Organic Carbon	Conductivity us/cm @ 25C	pH units
Accredited to ISO17025			✓	✓	✓
EX/1126082	MW11-08B-1 0.7-1.4	14/06/11			
EX/1126083	Report 121817 Blank	14/06/11			
EX/1126084	Report 121817 Blank Spike	14/06/11			

Note: For analysis where the Report Due date is greater than 7 days (Volatiles, PAH, Pesticides, PCB, Phenols, Herbicides) or 2 days (BOD) after the sampling date, although we will do our utmost to prioritise your samples, they may become deviant whilst being processed in the Laboratory.

In this instance, please contact the Laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A The sample was received in an inappropriate container for this analysis
B The sample was received without the correct preservation for this analysis
C Headspace present in the sample container
D The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E Sample processing did not commence within the appropriate holding time

Requested Analysis Key

Analysis Required
Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
No analysis scheduled
Analysis Subcontracted

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace FID
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	PAHMSW	As Received	Determination of PolyAromatic Hydrocarbons in water by pentane extraction GCMS quantitation
Water	PHEHPLC	As Received	Determination of Total Phenol by HPLC
Water	SFAPI	As Received	Determination of Total Phenols by segmented flow analysis with colorimetric detection
Water	SFAS	As Received	Determination of Sulphide by segmented flow analysis with colorimetric detection
Water	TPHFID	As Received	Determination of pentane extractable hydrocarbons in water by GC/FID
Water	VOCHSAW	As Received	Determination of Volatile Organics Compounds or Gasoline Range Hydrocarbons (GRO) by Headspace GCMS
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity ($\mu\text{S}/\text{cm}$) by electrical conductivity probe.
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

CR Denotes Crocidolite

AM Denotes Amosite

NAIIS No Asbestos Identified in Sample

Symbol Reference

[^] Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

Req Analysis requested, see attached sheets for results

▮ Raised detection limit due to nature of the sample

***** All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Where individual results are flagged see report notes for status.

Our Ref: EXR/121950 (Ver. 1)

Your Ref: 50065-29

July 6, 2011



Scientifics

Bretby Business Park

Ashby Road

Burton-on-Trent

Staffordshire

DE15 0YZ

Telephone: 01283 554400

Facsimile: 01283 554422

Ms N Glynn
Worley Parsons Komex
3 - 8 Redcliffe Parade West
Bristol
BS1 6SP

For the attention of Ms N Glynn

Dear Ms Glynn

LEACHATE SAMPLE ANALYSIS - Maelor Works

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Please be aware that from 1 January 2003 our policy for the retention of paper based laboratory records and analysis reports will be 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Scientifics) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for Scientifics

A handwritten signature in black ink that reads "J Colbourne".

J Colbourne
Project Co-ordinator
01283 554547

TEST REPORT

LEACHATE SAMPLE ANALYSIS



Report No. EXR/121950 (Ver. 1)

Worley Parsons Komex
3 - 8 Redcliffe Parade West
Bristol
BS1 6SP

Site: Maelor Works

The 3 samples described in this report were logged for analysis by Scientifics on 29-Jun-2011. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 06-Jul-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PAH (MS-SIM) (10) Results (Pages 5 to 7)
GC-FID Chromatograms (Pages 8 to 10)
Analytical and Deviating Sample Overview (Pages 11 to 12)
Table of Report Notes (Page 13)

On behalf of
Scientifics :
Andrew Timms

A handwritten signature in black ink, appearing to read 'Andrew Timms', is written over a faint, circular official stamp.

Operations Manager

Date of Issue: 06-Jul-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

[illegible]

[illegible]

[illegible]

Polycyclic Aromatic Hydrocarbons

GC/MS (SIM)

Customer and Site Details:	Worley Parsons Komex: Maelor Works		
Sample Details:	TP11-6-1 0.3-0.6	Job Number:	W12_1950
LIMS ID Number:	EX1126588	Date Booked in:	29-Jun-11
QC Batch Number:	110589	Date Extracted:	01-Jul-11
Quantitation File:	Initial Calibration	Date Analysed:	02-Jul-11
Directory:	701PAH.MS10\	Matrix:	Leachate
Dilution:	1.0	Ext Method:	Sep. Funnel

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration ug/l	% Fit
Naphthalene	91-20-3	3.13	0.058	96
Acenaphthylene	208-96-8	4.17	0.022	96
Acenaphthene	83-32-9	4.29	0.010	90
Fluorene	86-73-7	-	< 0.010	-
Phenanthrene	85-01-8	5.46	0.045	97
Anthracene	120-12-7	5.50	0.021	97
Fluoranthene	206-44-0	6.75	0.096	66
Pyrene	129-00-0	7.02	0.086	70
Benzo[a]anthracene	56-55-3	8.68	0.052	91
Chrysene	218-01-9	8.72	0.049	88
Benzo[b]fluoranthene	205-99-2	10.19	0.063	78
Benzo[k]fluoranthene	207-08-9	10.22	0.023	78
Benzo[a]pyrene	50-32-8	10.61	0.047	61
Indeno[1,2,3-cd]pyrene	193-39-5	11.98	0.032	57
Dibenzo[a,h]anthracene	53-70-3	-	< 0.010	-
Benzo[g,h,i]perylene	191-24-2	12.26	0.048	82
Total (USEPA16) PAHs	-	-	< 0.672	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	89
Acenaphthene-d10	86
Phenanthrene-d10	86
Chrysene-d12	82
Perylene-d12	81

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	81
Terphenyl-d14	95

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.