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Regulation 61 (1) Response for Nine Mile Point Waste Transfer Facility

Regulation 61(1) Notice Response

Hazrem Environmental Limited

Report No. CRM 083.003.PE R 001 Regulation 61(1) Notice Response

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enzygo.com

Contact Details:

Enzygo Ltd. (Bristol Office)
The Byre
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

tel: 01454 269237
email: steph.charnaud@enzygo.com
www: enzygo.com

Regulation 61 (1) Response for Nine Mile Point Waste Transfer Facility

Project:	Regulation 61(1) Notice Response
For:	Hazrem Environmental Limited
Status:	FINAL V2
Date:	January 2020
Author:	Steph Charnaud, Director of Permitting
Reviewer:	Peter Cumberlidge, Director

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1.0 Introduction

1.1 Background

1.1.1 Hazrem Environmental Limited has appointed Enzygo Limited to provide a response to Natural Resources Wales (NRW) with regard to their Regulation 61 (1) Notice Requiring Information issued on 4th April 2019.

1.1.2 The Notice requires Hazrem Environmental Limited to provide information to NRW to allow them to review the activities carried out a Nine Mile Point Waste Transfer Facility against the revised Best Available Techniques (BAT) Reference Document (BRef) for Waste Treatment.

1.1.3 Nine Mile Point Waste Transfer Facility is not yet constructed or operational but has in place an Environmental Permit EPR/AB3695CH with Hazrem Environmental Limited as being the Operator.

1.1.4 Once constructed the Facility will be located at the following address:

Nine Mile point Waste Processing Facility
Nine Mile Point Industrial Estate
Ynysddu
Cwmfelinfach
Caerphilly
NP11 7HZ

Figure 1.1.1: Site Location

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1.2 Objectives

1.2.1 This report has been written to provide the information requested by NRW in their Regulation 61 (1) notice dated 4th April 2019. Each of the points raised in the Notice are addressed in the separate Chapter's below.

1.3 Information Sources

1.3.1 The following sources of information were reviewed in producing this report:

- The Environmental Permitting (England and Wales) Regulations 2016 (as amended 2019);
- Environmental Permit Reference EPR/AB3695CH
- Documentation accompanying the Environmental Permit Application for Permit Reference EPR/AB3659CH
- Best Available Techniques (BAT) Reference Document for Waste Treatment 2018;
- Establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council, 10th August 2018; and;
- Industrial Emissions Directive 2015/2193.

1.4 Documents referred to

1.4.1 The site is still to be constructed and become operational and as a result the majority of the documents submitted as part of the original Permit Variation, Schedule 5 requests and the Appeal against NRW's original decision not to issue an Environmental Permit to the site still remain valid. The OTMP produced for the site has been updated in light of the updated BREF and BAT Conclusions documents for waste treatment. An updated copy of the OTMP is included in Appendix B to this document. The documents referred to through this document are listed in full below:

- H1 assessment, dated October 2015,
- Site Condition Report, CRM 083 002 PE R 004 SCR A FINAL, October 2015;
- Phase 1 Environmental and Mining Report, CRM 414 002 GE R 001, April 2015;
- Geo-environmental Report, CRM 083 001 GE R 002, May 2015;
- Environmental Risk Assessment, CRM 083 002 PE R 005 A ERA, July 2018;
- Odour and Air Quality Assessment: SRF Plant, Nine Mile Point, Caerphilly', September 2015;
- Emissions Note: Nine Mile Point Waste Processing Facility, October 2016;
- Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP B, October 2019;
- Accident Management Plan, CRM 083 002 PE R 011 AMP, July 2018;
- Odour Management Plan, CRM 083 002 PE R 008 OMP B, October 2019;
- Fire Prevention Plan, CRM 083 002 PE R 010 FPMP July 2018; and
- Noise Report FINAL, CRM 081 001 NO R 001, September 2015.

2.0 Confirm if the Facility Currently Complies with the Requirements of the BAT Conclusion

2.1 Overview

2.1.1 The Regulation 61(1) Notice requests that the Operator confirms whether or not their Operations currently comply with the requirements of the BAT Conclusion, including any associated emission levels, providing a description of the techniques in place and how they meet the standard.

2.2 Response

2.2.1 Operators of waste activities which require Environmental Permits must, according to Sector Guidance Note, S5.06: recovery and disposal of hazardous and non-hazardous waste, May 2013 (as amended 2018), meet the requirements of the S5:06 guidance and the requirements of the waste treatments BREF.

2.2.2 In document reference CRM 083 002 PE R 006 OTMP Operating Techniques and Monitoring Plan submitted along with the Permit Application for the Nine Mile Point Waste Processing Facility and updated in October 2019, provides information as to how the Facility would meet S5:06: recovery and disposal of hazardous and non-hazardous waste, May 2013. The updates to the document ensure that it also references the requirements of the Bat Conclusions for waste treatment 2018.

2.2.3 The tables below reflect if there have been any changes to the information provided in the Permit Application as a result of the amendments to the S5:06 Guidance and the Best Available Techniques (BAT) for Waste Treatment.

2.2.4 BAT Conclusion 1 requires Operators to ensure that the sector specific features listed within this BAT Conclusion are incorporated into the Facilities Environmental Management System when this is produced. As mentioned above the site is not yet constructed so the Environmental Management System, incorporating the requirements of BAT Conclusion will be updated to reflect the as built Facility.

2.2.5 BAT Conclusion 2 requires Operators to improve the overall performance of their plants. Table 2.2.1 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.1: Requirements of BAT 2 of the best available techniques (BAT) conclusions for waste treatment.

Requirement	Mitigation measures proposed by Operator	Meets BAT conclusion for waste treatment and S5:06?
Set up and implement waste characterisation and pre-acceptance waste procedures	See Section 2.1 of Permit Application Document Reference CRM 083 002 PE R 006 OTMP	Yes
Set up and implement waste acceptance procedures	See Section 2.1 and 2.2 of Permit Application Document Reference CRM 083 002 PE R 006 OTMP	Yes
Set up and implement a waste tracking system and inventory	Section 2 of the OTMP details the tracking which will occur of the waste received at the	Yes

	site, from pre-acceptance to waste removal from the Facility. Section 4 contains details of records to be kept and reporting to be completed.	
Set up and implement an output quality management system	SRF will be produced in accordance with BS EN 15359:2011	Yes
Ensure waste segregation	See Section 2.3 of Permit Application Document Reference CRM 083 002 PE R 006 OTMP	Yes
Ensure waste compatibility prior to mixing or blending of waste	N/A Only non-hazardous wastes are to be accepted onto the site.	N/A
Sort incoming solid waste	See Section 2.3 of Permit Application Document Reference CRM 083 002 PE R 006 OTMP	Yes

2.2.6 BAT 3 required information about the characteristics of the waste to be treated and the waste treatment process. A process flow diagram is provided with this information within Appendix C of the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP.

2.2.7 BAT 3 requires an inventory of waste water, as the site is not yet built the Operator requests that this requirement be met along with the requirements in pre-operational measure 2 within the Permit which requires the Operator so submit a copy of the Welsh Water consent to discharge to NRW at least two calendar months before commencement of operations as this information is not yet fully available due to the fact the site had not yet been constructed. Not yet compliant but will be compliant by 17th August 2022.

2.2.8 BAT 3 Requires information about the waste gas streams from the operation. The waste gas streams from Nine Mile Point Waste Transfer Facility will consist of gases from the waste drier, which are treated via the regenerative thermal oxidiser.

2.2.9 An Air Quality Assessment titled 'Odour and Air Quality Assessment: SRF Plant, Nine Mile Point, Caerphilly', September 2015, was provided for the operation by Air Quality Consultants and a subsequent note titled 'Emissions Note: Nine Mile Point Waste Processing Facility' was also provided in October 2016. The plant and equipment described in both these reports is still proposed to be used therefore these reports and the details of emissions from the site still remain valid. Due to the fact that the site is not yet constructed the above is the best information which can be provided at this time. The site shall be compliant by 17th August 2022.

2.2.10 A copy of the process flow diagram for the Facility is included in Appendix C.

2.2.11 BAT Conclusion's 4 and 5 require Operators to describe how risks to the environment associated with the storage, handling and treatment of waste will be managed. Table 2.2.2 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.2: Requirements of BAT 4 and 5 of the best available techniques (BAT) conclusions for waste treatment.

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**

Optimised storage location	Waste storage is detailed within the Operational Techniques and Monitoring Plan, CRM 083 002 PE R 006 OTMP and the Environmental Risk Assessment CRM 083 002 PE R 005 A ERA and the Fire Prevention Plan CRM 083 002 PE R 010 FMP FINAL V3. The site the Facility is located on is relatively small and there are constraints relating to the location	Yes
Adequate storage capacity	Waste storage is detailed within the Operational Techniques and Monitoring Plan, CRM 083 002 PE R 006 OTMP and the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Fire Prevention Plan CRM 083 002 PE R 010 FPMP. Incoming volumes of waste will be managed daily and weekly by monitoring the weighbridge tickets to ensure strict compliance with the annual permit condition of 100 000 tpa. The levels of waste within the waste reception building will be visually monitored. If the storage area within the waste reception building is approaching capacity waste deliveries will be suspended until such time that capacity is available.	Yes
Safe storage operation	Waste storage is detailed within the Operational Techniques and Monitoring Plan, CRM 083 002 PE R 006 OTMP and the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Fire Prevention Plan CRM 083 002 PE R 010 FMP FINAL V3.	Yes
Separate area for storage and handling of hazardous waste	N/A the site does not accept hazardous waste. See the Operational Techniques and	N/A

	Monitoring Plan. CRM 083 002 PE R 006 OTMP	
Handling and transfer of waste is carried out by competent staff	As required by the Permit a TCM will be in place before the site is operational. All staff will trained, as detailed in the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP	Yes
Measures are taken to prevent, detect and mitigate spills	Details provided in the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Accident Management Plan CRM 083 002 PE R 011.	Yes
Operation and design precautions are taken when mixing or blending wastes.	Details are provided within the Operational Techniques and Monitoring Plan, CRM 083 002 PE R 006 OTMP and the Environmental Risk Assessment CRM 083 002 PE R 005 ERA. As above no hazardous wastes are to be accepted into the site	Yes

2.2.12 BAT 6 requires emissions to water to be monitored. As per the Environmental Risk Assessment, CRM 083 002 PE R 005 ERA and the Environmental Permit Table 3.2, only surface water from building roofs and areas not associated with waste storage and treatment shall be released to surface water. These shall be monitored for oil and grease on a monthly basis as specified by the Permit, EPR/AB3695CH. This also meets the requirements of BAT 7, Hydrocarbon Oil Index.

2.2.13 Process water will be released to sewer in accordance with a Welsh Water Trade Effluent consent.

2.2.14 BAT 9 is to monitor the diffuse emissions of organic compounds from the regeneration of solvents. This is not relevant to the operations at Nine Mile Point Waste Transfer Station.

2.2.15 BAT 8 requires defined emissions to air to be monitored in accordance with EN Standards. The Operator will monitor emissions to air from the site, which arise from the waste dryer and regenerative thermal oxidiser, in accordance with the requirements of table S3.1of the Permit for the Facility.

2.2.16 An odour management plan was submitted as part of the Permit Application, CRM 083 002 PE R 008 OMP B FINAL. The Operational Techniques and Monitoring Plan, CRM 083 002 PE R 006 OTMP also contains an assessment of the requirements for the control of odour which are still deemed to meet the requirements of BAT 10 and 12.

2.2.17 BAT 11 requires the Operator to monitor annual consumption of water, energy and raw materials as well as the annual generation of residues and waste-water, with a frequency of at least once per year. The Operator will maintain records of the consumption of water, energy, raw materials along with the annual generation of residues and waste-water at the site. These

records will be updated annually and maintained within the Facility's Environmental Management System.

2.2.18 BAT Conclusion 13 requires Operators to describe how odours from the operations shall be prevented or minimised. Table 2.2.3 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.3: Requirements of BAT 13 of the best available techniques (BAT) conclusions for waste treatment

Requirement	Mitigation Measures Proposed by the Operator	Does this comply with the BAT Conclusions for Waste Treatment and S5:06
Minimise residence times	Only applicable to open systems which Nine Mile Point is not. However, residence times of waste within the building are minimised. See Section 3.5 Control of emissions of odour in the Operational Techniques and Monitoring Plan CRM 083 002 PR R 006 OTMP and the Odour Management Plan CRM 083 002 PE R 008 OMP B	N/A
Using chemical treatment	N/A The Operator will use a regenerative thermal oxidiser for the treatment of odours generated by the Facilities Operations. The RTO is designed to have an odour destruction efficiency approaching 100%. This is described in Table 3.5.3 in the Operational Techniques and Monitoring Plan submitted alongside the Permit Application.	N/A
Optimising aerobic treatment	N/A no water based liquid waste treatment	N/A

2.2.19 BAT Conclusion 14 requires Operators to describe how they will prevent, or reduce diffuse emissions to air from their operations. Table 2.2.4 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.4: Requirements of BAT 14 of the best available techniques (BAT) conclusions for waste treatment

Requirement	Mitigation Measures Proposed by the Operator	Does this comply with the BAT Conclusions for Waste Treatment and S5:06

Minimising the number of potential diffuse emission sources	See detail in the Environmental Risk Assessment CRM 083 002 PE R 005 ERA	Yes
Selection and use of high-integrity equipment	The plant and equipment to be used at the Facility will be sourced from well known suppliers, which have been widely used and tested at similar facilities within Europe and the UK.	Yes
Corrosion Prevention	Construction materials and those materials used within the plant and equipment will include corrosion prevention where necessary.	Yes
Collection, containment and treatment of diffuse emissions	Waste deliveries, treatment and processing takes place within a building which is maintained under negative pressure and fitted with fast acting roller shutter doors. A dust suppression system is in place within the building, consisting of 4 dust suppression units. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Operation Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP for detail.	Yes
Dampening	Waste deliveries, treatment and processing takes place within a building which is maintained under negative pressure and fitted with fast acting roller shutter doors. A dust suppression system is in place within the building. Only baled SRF/RDF is stored outside the curtilage of the building and these bales are wrapped 5 times and inspected regularly for damage. Roads within the Facility are paved and are inspected daily and washed/sprayed when required. See the Environmental Risk	Yes

	Assessment CRM 083 002 PE R 005 ERA Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP.	
Maintenance	Plant and equipment on site will be maintained in accordance with the manufacturer's instructions. The Environmental Management System will be updated with maintenance schedules and the details of maintenance contracts once the plant has been constructed and commissioned.	Yes
Cleaning of waste treatment and storage areas	Details are included in the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP	Yes
Leak Detection and repair (LDAR) programme	The facility will install a SCADA system. Details will need to follow once the Facility is built and starts to operate, however the operator will ensure that the system is capable of monitoring fugitive emissions of VOC's.	SCADA system will be designed to monitor VOC's

2.2.20 BAT 15 and 16 are not relevant to this Operation as there is no flare on the site.

2.2.21 BAT 17 is to set up, implement and regularly review a noise and vibration management plan. A noise and vibration management plan meeting the requirements of BAT 17 shall be submitted in line with Improvement Condition 2 of the Environmental Permit. This will enable to as built noise emissions to be assessed and accurate and proportionate measures to be put in place to control emissions of noise from the Facility. All activities except for the storage of baled RDF/SRF will be undertaken within the Facility's building.

2.2.22 BAT Conclusion 18 requires Operators to prevent or reduce noise and vibration from their operations. Table 2.2.5 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Figure 2.2.5: Requirements of BAT 18 of the best available techniques (BAT) conclusions for waste treatment.

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**

Appropriate location of buildings and equipment	See table 3.9.3 in the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP, Noise Impact Assessment, CRM 083 001 NO R 001 submitted as part of the Permit Application. The site is relatively constrained in terms of the plant and equipment to be installed. However, the sorting and processing of the waste material will be carried out within the Facility's building.	Yes, as reasonably practicable within the constraints of the site.
Operational measures	See Table 3.9.3 in the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP, Noise Impact Assessment, CRM 083 001 NO R 001 submitted as part of the Permit Application.	Yes
Low-noise equipment	Noise from the equipment to be used at the Facility was considered during procurement and the equipment which has been procured is the most appropriate for the facility's operations when taking into account minimising emissions of noise.	Yes
Noise and vibration control equipment	With the exception of the dryer, all noise equipment is located within the Facility's building will have appropriate noise attenuation. Noise attenuators will be fitted to the dryer fans which are the main source of noise from the dryer. The fans will also be run at 1000rpm instead of 1500rpm to further reduce the level of noise generated by the dryer. See Noise Impact Assessment, CRM 083 001 NO R 001 in Appendix H of the Environmental Risk Assessment.	Yes
Noise attenuation	The site is located within an industrial Estate, to the east	Yes

	and west of the site there are other industrial units, which will provide an element of acoustic control. See Noise Impact Assessment, CRM 083 001 NO R 001 in Appendix H of the Environmental Risk Assessment.	

2.2.23 BAT Conclusion 19 requires Operators to describe how they will optimise water consumption, reduce the quantity of water generated and reduce emissions to soil and water. Table 2.2.6 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Figure 2.2.6: Requirements of BAT 19 of the best available techniques (BAT) conclusions for waste treatment.

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**
Water management	Water is not required for the process. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA, and the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP	Yes
Water recirculation	N/A	N/A
Impermeable surface	The whole site is located on an impermeable hardstanding, including within the building which is used to receive and process the waste. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA.	Yes
Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels	The only potentially polluting liquids held on site are, maintenance oils which are held within bunds which are sized to hold 110% of the volume of the largest container and are on hardstanding. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA.	Yes
Roofing of waste storage and treatment areas	Bales of SRF and RDF which are wrapped 5 times and stored externally to the building under a canopy. All other waste is	Yes

	stored and treated within the building. Bales are checked for damage and rewrapped if required, and stored on an impermeable surface. See the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP.	
Segregation of water streams	Process runoff from the building is directed to public sewer via a trade effluent consent issued by Welsh Water. Surface water from the roofs and site surface water is directed to storage crates on the site via a full retention interceptor. This water is then discharged to the existing surface water drainage system at Nine Mile Point Industrial Estate. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OMTP. As per pre-operational condition 2 within Table S1.4 of the site Permit, a detailed site drainage plan and proposed maintenance and survey schedule for the drainage system will be submitted to NRW at least 2 months prior to commencement of operations.	Yes
Adequate drainage infrastructure	Process runoff from the building is directed to public sewer via a trade effluent consent issued by Welsh Water. Surface water from the roofs and site surface water is directed to storage crates on the site via a full retention interceptor. This water is then discharged to the existing surface water drainage system at Nine Mile Point Industrial Estate. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Operational Techniques and	Yes

	Monitoring Plan CRM 083 002 PE R 006 OTMP	
Design and maintenance provisions to allow detection and repair of leaks	Waste is not stored in tanks on site. The SCADA system will be designed to monitor leaks from the affluent collection tank	Yes
Appropriate buffer storage capacity	Surface water from the roofs and site surface water is directed to storage crates on the site via a full retention interceptor. This water is then discharged to the existing surface water drainage system at Nine Mile Point Industrial Estate. See the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP	Yes

2.2.24 BAT Conclusion 21 requires Operators to describe how they will prevent or limit the environmental consequences from accident and incidents. Table 2.2.8 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.8 Requirements of BAT 21 of the best available techniques (BAT) conclusions for waste treatment, emissions from accidents and incidents

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**
Protection measures	Site security systems to prevent unauthorised access include a perimeter security fence, security gates and CCTV monitoring. A fire suppression system is to be installed by a UKAS accredited company at the site as per the Fire Prevention Plan CRM 083 002 PE R 010 FPMP - details of the suppression system will be provided to NRW at least 3 months before the site becomes operational. The plan will also be updated to include details of where the fire detection and suppression equipment is located.	Yes

	The Accident Management Plan CRM 083 002 PE R 011 AMP will be updated with detail on where the spill equipment will be contained once the site has been constructed. As detailed within the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and the Accident Management Plan CRM 083 002 PE R 011.	
Management of incidental/accidental emissions	Procedures to manage the containment of accidental emissions are contained within the Accident Management Plan CRM 083 002 PE R 011 and the Fire Prevention Plan CRM 083 002 PE R 010	Yes
Incident/accident registration and assessment system	Appendix H of the Accident Management Plan CRM 083 002 PE R 011 contains an incident record where details of any incidents occurring on site will be recorded, along with actions taken to remedy the incident and a review of why the incident occurred and how similar incidents could be prevented in the future.	Yes

2.2.25 BAT 22 requires the Operator to substitute materials with waste. Given the current understanding of the as built plant, it is not considered feasible to replace any raw non -waste materials used to operate it with waste materials. However if future developments allow a raw material to be replaced with a wate material, the operator will consider the use of waste subject to those wastes meeting the relevant end of waste criteria.

2.2.26 BAT Conclusion 23 requires Operators to use energy efficiently. Table 2.2.9 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.9 Requirements of BAT 23 of the best available techniques (BAT) conclusions for waste treatment

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**
Energy Efficiency Plan	An energy efficiency plan has not yet been produced for the site. A plan will be produced	Not currently

	once the final plant and equipment to be installed on the site had been confirmed and the site constructed	
Energy Balance Record	An updated energy balance record will be provided one the final plant and equipment to be installed on the site has been confirmed and the site constructed.	Not Currently

2.2.27 BAT 24 required Operators to reduce the quantity of waste sent for disposal by maximising the reuse of packaging. As per section 2.2.5 of the Operational Techniques and Monitoring Plan submitted with the Permit Application waste will be received on site in sheeted skips of containers which are re-useable. In terms of materials used on site as per pre-operational measure 3 the accident management plan and more specifically the chemicals inventory within the accident management plan will need to be updated when the site is constructed. The Operator will as far as reasonably practicable ensure that the containers within which any chemicals which are used on are held within are either reused or recycled.

2.2.28 BAT Conclusion 25 requires Operators to reduce emissions to air of dust and particulates. Table 2.2.10 describes how Nine Mile Point Waste Transfer Facility will meet these requirements.

Table 2.2.10 Requirements of BAT 25 of the best available techniques (BAT) conclusions for waste treatment, emissions to air from the mechanical treatment of waste.

Requirement	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**
Cyclone	N/A	N/A
Fabric Filter	The dryer is fitted with a bag filter which will filter particulates from the air flow. Filtration efficiency will be <5mg/m³. This will be maintained and replaced as specified by the manufacturer.	Yes
Wet Scrubbing	N/A	N/A
Water injection into the shredder	N/A. The waste to be accepted already has a reasonable moisture content so water is not proposed to be added to the shredder	N/A

2.2.29 BAT 31 is to use either one or a combination of the techniques listed in Table 2.2.11 to reduce the emissions of organic compounds to sir.

Table 2.2.11: Techniques to Reduce Emissions to Air

Technique	**Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**

Adsorption	N/A	N/A
Biofilter	N/A	N/A
Thermal Oxidation	The Operator is installing a Regenerative Thermal Oxidiser which will treat the waste gassed from the dryer before release to air. The RTO will have an operating temperature of approximately 850°C	Yes
Wet Scrubbing	N/A	N/A

Figure 2.2.12: BAT EAL for Channelled TVOC emissions to air from the mechanical treatment of waste with calorific value.

Parameter	**BAT-EAL (average over sampling period)**	**Mitigation Measures Proposed by the Operator**	**Does this comply with the BAT Conclusions for Waste Treatment and S5:06**
TVOC	10-30mg/Nm³	Regenerative Thermal Oxidiser	YEs

2.2.30 The notes associated with the BAT-AEL state that the BAT-EAL only applies when organic compounds are identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3.

2.2.31 It is well understood that regenerative thermal oxidisers are designed to decompose volatile organic compounds the exact specifications of the RTO to be installed at the Facility still to be determined. However, the Operator shall ensure that the RTO chosen to be installed is designed to meet the BAT-EAL requirements outlined in Table 2.2.12 above.

3.0 Actions if the Facility does not Comply with the BAT Conclusion

3.1 Overview

3.1.1 The Regulation 61(1) Notice requests that if the site does not comply with the BAT conclusion, the Operator should describe how and by when they intend to meet the standard. The date of compliance must be before 17th August 2022, which is the 'compliance date'.

3.2 Response

3.2.1 Some detail to fully determine if the Facility complies with the BAT Conclusions, which is detailed in Section 2 above and in the Sections which follow Section 3, is still required. However, as the site is not yet constructed the Operator will be able to design the infrastructure to meet BAT requirements and the information to prove this shall be submitted in line with the timescales set out in Table S1.3 and Table S1.4 of Permit reference EPR/AB3695CH. Based on the information which is currently available in terms of the proposed operations and infrastructure, the Facility will comply with the BAT Conclusions.

3.2.2 As detailed in BAT 14 above, there will be a SCADA system in place however full details of it and any leak detection and repair (LDAR) programme to monitor VOCs will need to be confirmed once the plant and equipment has been installed on the site.

3.2.3 As detailed above, the requirements of BAT 23 relating to energy efficiency will be meet once the site has been constructed. This will enable an accurate reflection of the Facility's energy usage to be gathered and accurate plans and records to be prepared.

3.2.4 It is planned for the site to be operational by 17th August 2022.

4.0 Actions if the Facility is Intending to Operate in a Non-Compliant Manner post 17th August 2022

4.1 Overview

4.1.1 The Regulation 61(1) Notice asks the Operator to confirm if they intend to continue to operate in a manner which would not comply with the relevant BAT Conclusion after the compliance date, and in such case what the justification would be for being allowed to do so. The Notice also asks the Operator to confirm what date they would intend to come into full compliance, or provide a description of alternative measures to be adopted that would provide full environmental protection.

4.2 Response

4.2.1 The Operator is not intending to operate in a non-compliant manner post 17th August 2022. All BAT Conclusions which are not currently being complied with will be addressed as the Facility is constructed and the requirements of the BAT Conclusions will be met.

5.0 Justification for not Meeting Associated BAT-EAL

5.1 Overview

5.1.1 The Regulation 61(1) Notice asks the Operator that where the BAT Conclusion has a BAT Associated ELV (BAT-ELV) specified, with which the Facility does not comply with by the compliance date, the Operator should consider requesting a derogation.

5.1.2 To do this sufficient technical and commercial information to demonstrate that achieving that BAT-EAL would lead to costs that are disproportionately high, compared with environmental benefits due to one or more of:

- The geographical location of your installation;
- The local environmental conditions around your installation;
- The technical characteristics of your installation.

5.2 Response

5.2.1 As previously discussed the Facility is not yet built or operational. The assessments which were carried out as part of the pre-application submissions still stand as there have not been any changes to the plant or equipment proposed to be used on the site since the Permit application. These assessments show that the BAT EAL requirements, based on the information provided by the equipment supplier will be met. The Operator is therefore not proposing to apply for a derogation to the BAT EAL's at this time.

5.2.2 The permit limits emissions of oxides of nitrogen from the waste dryer and RTO to 80mg/m³, which is within the limits of oxides of nitrogen defined in the BAT Reference Document for Waste Treatment for the mechanical treatment of waste. The air quality assessment which can be found appended to the Operational Techniques and Monitoring Plan

5.2.3 The only release to surface water from the site is clean runoff from the roofs and areas of the site not used to store waste via a full retention interceptor. The Permit requires visual monitoring of oil and grease.

5.2.4 Effluent from the waste storage and treatment areas will be discharged to sewer via a trade effluent consent which will be obtained from Welsh Water.

5.2.5 Given the design of the plant and equipment to be installed on the site, the information which the Operator has been provided by the equipment manufacturer's and the operations which are to be carried out at the site, it is assumed that the relevant BAT EAL's will be able to be met.

6.0 OPRA Profile

6.1 Overview

6.1.1 The Regulation 61(1) Notice askes the Operator to provide a OPRA profile, upon which your variation fee, is applicable will be based.

6.2 Response

6.2.1 As requested an OPRA profile is provided alongside this response, however it is not anticipated that the Environmental Permit will need to be varied as a result of this BAT Review. This OPRA profile has not changed significantly from the profile which was provided in 2015 as part of the Permit Application documentation as the site has not been built and therefore is not operational.

7.0 Baseline Report

7.1.1 Point 6 of the Regulation 61 (1) Notice requires Hazrem Environmental Limited to carry out a risk assessment considering the possibility of soil and groundwater contamination at the installation where the activity involves the use, production or release of relevant hazardous substances, as defined in Article 3 (18) of the Industrial Emissions Directive.

7.1.2 Where any risk of such contamination is established, then Hazrem Environmental Limited are required to either:

- Prepare and submit a baseline report containing information necessary to determine the current state of soil and groundwater contamination: or,
- Provide a summary report referring to information previously submitted where it is satisfied that such information represents the current state of soil and groundwater contamination.

7.1.3 In Table S1.4 of the Site's Permit, pre-operational condition 6 requires the operator to submit a report on the baseline conditions of soil and groundwater at the site at least 4 months prior to the site being operational.

7.2 Response

7.2.1 As part of the Permit Application process, a Site Condition Report with a summary of baseline conditions at the site was prepared. This report is referenced CRM 083 002 PE R 004 SCR A FINAL, dated September 2015, and is considered to be still valid.

7.2.2 This report found that there was made ground on the site and that indicated that there may have been the potential for contamination sources. So, a further report titled *Phase 1 Environmental and Mining Report* referenced CRM 414 002 GE R 001 was also provided within Appendix D to the Site Condition Report. This report concluded that appropriate environmental sampling should be undertaken to determine the soil quality.

7.2.3 As a result of the above recommendation sampling was undertaken, in May 2015, and a third report titled *Geo-environmental Report* and referenced CRM 083 001 GE R 002 was undertaken. This report was included in Appendix E of the Site Condition Report.

7.2.4 All three of these reports are attached, for reference, within Appendix A of this document.

7.2.5 No changes have occurred on the site since these reports were written and the sampling of the ground undertaken. Therefore, there is no reason to suspect that these reports do not accurately reflect the current status of the soil and groundwater at the site.

7.2.6 As the Facility has not yet been constructed it is still not possible to define a list of relevant substances which will be stored at the site within the meaning of Article 22 of the Industrial Emissions Directive. This is the first step of undertaking a baseline survey, when looking at the European Commission's Guidance concerning baseline reports under Article 22 (2) of the Industrial Emissions Directive 2014/C/136/03.

7.2.7 The waste which is accepted onto the site is of a non-hazardous nature, therefore the only source of relevant hazardous substances will be the plant and equipment which is used on the site.

7.2.8 The only relevant hazardous substances, as defined by the CLP Regulations, which are currently proposed to be stored on site will be maintenance oils. As the site has not yet been constructed the exact status of these oils and their classification under the CLP Regulations is unknown. Mineral oil is a generic term which may be applicable to cover such substances. Under the CLP Regulations this is given an environmental hazard category of aquatic chronic. As detailed in the Environmental Risk Assessment CRM 083 002 PE R 005 ERA and Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP mineral oils will be stored in the maintenance area and be contained within a bund designed to contain 110% of the volume of the largest container. The Accident Management Plan CRM 083 002 PE R 011B references the measures which are in place in the case of spills of maintenance oils. The information in the Accident Management Plan still remains valid.

7.2.9 Given the status of the Site it is suggested that an update to the information provided in Appendix A and listed in pre-operation condition 6 is provided in line with the timescales given in pre-operational condition 6, i.e. 4 months prior to site operations commencing. This will ensure that a full list of relevant hazardous substances is available which will result in an accurate baseline assessment.

8.0 Discharges to Surface Water and /or Sewer

8.1.1 Point 7 on NRW's Regulation 61 (1) notice requires for all discharges to surface waters and/or sewer information for priority substances and any other relevant substances.

8.1.2 As the site is not currently built or operational no monitoring of discharges to water or sewer have been undertaken. When the site is operational, monitoring as required by Permit Reference EPR/AB3695CH in line with M18 guidance 'Monitoring of Discharges to water and sewer' will be undertaken.

8.1.3 The waste which is to be received and processed on site will be non-hazardous waste. Therefore, no priority hazardous substances are present in the waste. As mentioned above the site may need to store maintenance oils in a bunded area, within the maintenance area of the site. The details of these oils are not yet known. Once the Facility has been constructed and details of the type and quantity of maintenance oils stored can be determined then a screening test can be carried out.

8.1.4 Surface water from the site shall be discharged via full retention interceptors and storage crates into Nine Mile Point Industrial Estate's existing surface water drainage system as specified in the Permit Application documentation.

8.1.5 As required by pre-operational measure 2 in table S1.4 in the Permit, at least two calendar months before the commencement of the operations at the site, a final site drainage plan will be submitted to NRW. This plan will detail how contaminated and non-contaminated liquids are kept separate, and will include a copy of the consent to discharge to foul sewer from Welsh Water.

8.1.6 The Environmental Permit requires in Schedule 3, S3.2, that the surface water which arises from the roofs of the buildings on the site as well as areas not associated with waste storage and treatment is checked monthly for visible signs of oil and grease. Monitoring in line with the Environmental Permit and the Facility's EMS will take place once operations commence.

8.1.7 A trade effluent consent, issued by Welsh Water will be place for the discharge of waste-water from the waste processing building, as specified in the Permit Application documentation, prior to the Facility becoming operational.

8.1.8 The Environmental Permit states in in Schedule 3, S3.3 that the waste water from the waste processing building be discharged in accordance with the Welsh Water Trade Effluent consent.

8.1.9 No priority hazardous pollutants are released as a result of the Permitted Operations. Therefore, the information provided within the following documents submitted as part of the Permit Application are still valid;

- H1 assessment, dated October 2015;
- Environmental Risk Assessment, CRM 083 002 PE R 005 A ERA;
- Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 OTMP, October 2019

Appendix A – Geotechnical Reports

enzygo
environmental consultants

Geo-environmental Report

Land at Nine mile Point Industrial Estate, Caerphilly, NP11 7HZ.

For

Hazrem Ltd

'Experience and expertise working in unison'

www.enzygo.com

Contact Details:

Enzygo Ltd.
The Granary
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

tel: 01454 269237
fax: 01454 269760
email: steve.rhodes@enzygo.com
www: enzygo.com

Geo-environmental Report

Project:	Land at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ
For:	Hazrem Ltd
Ref:	CRM.083.001 GE.R 002
Status:	Final
Date:	May 2015
Author:	Richard Hamilton – **Associate Director**
Reviewer:	Steve Rhodes - **Technical Director**

Enzygo Limited Registered in England No. 6525159
Registered Office Stag House The Chipping Wotton-Under-Edge Gloucestershire GL12 7AD

Executive Summary

Proposed Development

The proposed development comprises is for a SRF (solid Recovered fuel)/ RDF (refuse derived fuel production facility.

Investigation

Site works were undertaken by Enzygo Ltd. in May 2015, together with a desk study, monitoring and preliminary soil infiltration testing.

Ground Conditions

Ground conditions were noted to comprise Made Ground over glacial fluvial sandy gravel. Groundwater was not encountered.

Contamination

No evidence of contamination has been identified from the desk study or ground investigation.

Mining Risk

The risk of shallow mining has been dismissed however there is a shaft on site which has been appropriately covered and infilled, however a 11m no building exclusion zone should be established from the edge of the shaft.

Foundations

Piled foundations are recommended, however local obstruction may be encountered (timber props) which will result in pre excavation works before piling. The piles are likely to extend into the underlying sandy gravels proved below 3.50m bgl, however further deep boreholes are likely to be required by the piling contractor in order to confirm piling parameters. Given the thickness of the Made Ground a suspended floor slab is recommended.

Re-use of Materials

Made Ground is not considered suitable for re-use as an engineered fill.

Pavement Design

A design CBR of 20% is recommended for the underlying natural materials. Soils are not considered to be frost susceptible.

Buried Concrete

It is considered that Class AC-1s conditions of Special Digest 1 can be used.

Drainage

Given the thickness of Made Ground soakaway drainage is recommended below this within the sandy gravels with a soil infiltration value of $1.9E^{-03}$m/s.

Gas and Radon

No radon protection measures are required. Based on the anecdotal evidence from the adjacent site gas monitoring should be undertaken to confirm that presence of gas underneath the site.

Further works

Deep boreholes will be required to confirm piling parameters and the gas regime across the site.

The mine shaft cap should be surveyed so it can be demonstrate rather that it here is no building zone around the shaft cap.

TABLE OF CONTENTS

1.0 INTRODUCTION

Background

1.1 Enzygo Limited has been commissioned by Hazrem Ltd to prepare a Phase II Geo environmental Report for a proposed SRF (solid Recovered fuel)/ RDF (refuse derived fuel production facility, at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ.

Proposed Development

1.2 An initial existing site Layout plan has been provided. This has been incorporated into the site location plan included in the Drawing section of this report.

Objectives

1.3 The objectives of the study are to:

- Review historical plans, geology, hydrogeology, site sensitivity, and mining records in order to complete a Desk Study. A Groundsure report has been provided, a copy of which is included in Appendix A;
- Review the coal mining report and mine abandonment plans for the site. Copies of which are given in Appendix B;
- Review available BGS logs for the site and the surrounding area. Copies of which are given in Appendix C;
- Undertake a targeted ground investigation for the proposed development;
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and
- Provide a factual and interpretative report relating to the desk study and site investigations. Provide a revised conceptual model and recommendations on any potential development issues and mitigation measures, where appropriate.
- Provide geotechnical recommendations in relation to foundations and infrastructure.

Risk Classification

1.4 Where adverse risks from ground instability are identified these are discussed within the report.

2.0 SITE SETTING

Site Description

Item	Description
Site Address	Land at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ
National Grid Reference	Centre of the site ST 1922691293.

Current Site Description

2.1 The following site description has been compiled from the current maps and aerial photographs.

2.2 The site is currently undeveloped and has a number of trees and vegetation within and around it.

2.3 The western edge containing trees is raised upon a bank, the rest of the site is relatively flat with small undulations.

2.4 There site is bordered by an industrial unit to the east and roads to the south and west.

2.5 Across the road to the west there are a number of industrial units and a car park.

2.6 To the north and south of the site across the adjacent road is an area of woodland.

2.7 The Sirhowy Rivers runs parallel to the southern boundary of the site beyond the woodland.

2.8 A area of gravel located on the site is understood to be former soakaway.

2.9 To the north of the site there is coal shaft. Base on the walkover this may be marked by a change in vegetation.

Surrounding Area

2.10 Land uses surrounding the site are summarised as follows:

Direction	Land Use
South	Road, Woodland and River.
East	Industrial units and a car park.
West	Road and industrial units.
North	Road and woodland.

2.11 The geotechnical risks for the site are associated with the disused mine shaft located within the northern section of the site and the adjacent mine shaft located to the north east of the site and the potential Made Ground across the site associated with the spoil from the mine. .

3.0 SITE HISTORY

3.1 A review of historical Ordnance Survey maps and information pertinent to the site and within a 250m radius is summarised below:

Potentially Contaminative Historical Land Use		
Map Edition	**Site**	**Surrounding Area**
1879-1901	North part of the site is shown as woodland. A Tramway is shown dissects the site from the east to the west. The southern part of the site and to the south of the tramway is open fields with four drains draining south into a further drain which drains south into the River Sirhowy located on the southern boundary of the site. A footpath is shown on the northern boundary of the site and trending west east across the site.	Unreferenced Road 50m N. Glan-yr-Afon Farm 20m S. Open fields surround the site. Railway shown 120m S.
1916-1920	The site comprises Nine Mile Point Colliery shown to the north of the site. A mine shaft is shown in the northern part of the site. Railway siding are shown to the south of the colliery buildings and central part of the site and spoil heaps to the south.	Old tramway shown 90m NE of the site connecting to two quarries the closest is 240m NE. The main Nine Mile Point Colliery buildings are shown 0m N and E. With two additional mine buildings within the site. These are thought to be associated with the mine shafts and the railway collection and delivery areas. Two further shafts are showing 10m E and 80m E. A water reservoir is shown 100m NW associated with the mine. Tanks are shown 50m NW.
1938-1948	No significant changes	Spoils heaps are shown to the south west of the site supplied by an aerial ropeway from the mine.
1960-1965	An additional building associated with the railway siding is shown in the central western part of the site. A drain is shown in the north western part of the site flowing to the east. Numerous spoil heaps and Made Ground are shown to the south of the site and in-between the main railway siding and building to the north and the river to the south. Pylons are shown coming into the site from the west. Google records indicate that the colliery closes in 1964.	The tanks are not shown. Further spoil heaps are shown on the former open filed and Glan-yr Afon farm 0m S of the site and are connected to the mine by aerial conveyors. The entire area to the south of the mine buildings up to in excess of 250m is shown as spoils heaps.
1974	No mine or shafts are shown. The entire site has been re-graded and is shown as level site with a road embankment to the N and the stepped embankment to the south with track running west to east. The River Sirhowy has been diverted to be 50m S of the site. A track is shown to dissect the site from the NW to the E.	The areas has been re graded to form a plateau between the road to the north and the newly diverted river coarse to the south.
1982	The track is not shown.	The eastern and southern boundaries of the site are shown by roads. The previous track is no longer shown. The undeveloped parcel of land to the east of the site which was also re-graded as part of the redevelopment works is now occupied

		by three factories.
1988	Site is shown as part of the Nine Mile Point Industrial Estate	The eastern road is shown as Green Meadow road and the southern road shown as Heol Tir Ton. A new Industrial building with associated car parking to the north is shown 50m E of the site. An electrical substation is shown 50m SE of the site. Further industrial units are shown 100m E.
1993	No changes.	The industrial unit to the east has enlarged and now extends up to 0m E of the site. The Industrial unit to the west has also enlarged to the south and west.
2002	A small area of land on the eastern boundary of the site has been cornered off opposite the access road to the adjacent industrial estate on the western boundary of the site. Google images indicate the re graded land for the site has been subject to the drainage system which drains the site into a drain running down the eastern boundary of the site. Google images of the 2010 also show clearly differing vegetation growth indicating the possible position of a mine shaft cap underneath.	No significant changes
2010-2014	The small area of land shown on the western boundary of the site is not shown.	No changes

3.2 There is a low risk associated with the colliery 500m south of the site and any associated workings underneath the site. There is a moderate risk given the presence of a shaft on the site and a shaft close to the site. The colliery is shown as accessing the coal from shafts and not from the surface. It is therefore likely that the depth of the workings will be in excess of 30m at the site.

3.3 There is a low risk associated with the previous drains and tramway across the site given the considerable regarding of the site during the life time of the mine and the age of these features.

3.4 There is a low risk associated with the potential for Made Ground associated with spoil across the site being used as part of the re-grading exercise during the 1970's.

3.5 There is moderate risk associated with the backfill and/or treatment of the shafts which will require further clarification.

3.6 No other significant risks are identified.

3.7 Ground instability risks assessed within mining working section in Section 4.

4.0 ENVIRONMENTAL SETTING

Ground Conditions

4.1 The British Geological Survey (BGS) indicates that the site is underlain by the following geological sequence:

Geological Unit	Type	Description	Aquifer Classification
Drift.	Glaciofluvial Deposits. (northern section)	Sand and Gravel.	Secondary (A).
	Alluvium (southern section).	Clay, Silt, Sand and Gravel	Secondary (A).
Solid.	Birthdir Member.	Sandstone with mudstone and coal bands at depth.	Secondary (A).

4.2 Made Ground has not been recorded in the Groundsure information, however re-grading has been encountered across the site associated with the closure of the mine post 1964. It is therefore likely that substantial Made Ground is present across the site and this is likely to be associated with the spoil heaps from the mine.

4.3 There are no records of landslip within 500m of the site.

4.4 Records of background soil chemistry do not show any elevated concentrations, however this does not take into account the likely presence of Made Ground on the site.

4.5 BGS boreholes records for the site and the surrounding area indicate the presence of coal seams at depths ranging from 150m to 410m. Based on these records the coal seams range in thickness from 1m to 2m thick.

4.6 A fault line is shown to dissect the site from the north east to the south west. The displacement is unknown however it has been recorded in the shaft records for the mine.

Groundwater

4.7 The recorded permeability of the drift geology is very low to very high reflecting the variable nature of the materials with the low permeability reflecting the cohesive Alluvium and the high permeability reflecting the Glaciofluvial deposits. The recorded permeability of the solid geology depends on the classification as a sandstone, siltstone or mudstone and varies

accordingly from high to moderate and has fracture flow type. The permeability of the solid materials underneath the site are dominated by the sandstone and is generally high.

4.8 The Ground Sure Report shows the site to be outside of any Source Protection Zones.

4.9 There are no groundwater abstraction licenses within 500m of the site.

4.10 BGS records show the site to have a low risk to groundwater flooding based on geological conditions. Historically this is likely to be associated with the Alluvium and the previous water-coarse to the south of the site, however the site has been subject to substantial land raising associated with the regarding of the site post mine closure.

Coal Mining

4.11 The ground sure report has identified coal working associated with the site. A coal mining report was obtained and is given in Appendix C. The Coal Mining report indicates that the site is underlain by 5 coal seams at shallow depths ranging from 150m to 410m depth and last worked in 1962 to 240m depth and last worked in 1962, which links to the collieries closure in 1964. The Coal Authority has concluded that any ground movements from these coal workings should have stopped.

4.12 The Coal Mining report indicates that there are two coal mine entries/shafts within 20m of the site.

4.13 The first shaft is located within the site (Ref 319191-0010) and was originally filled with washery shale in 1965 and covered with a reinforced cap in 1970.

4.14 The second shaft is located 10m east of the site (319191-002) was conveyed to Islwyn Borough council in 1971.

4.15 Further records obtained from the Coal Authority (Shaft Plan and data sheets) indicates that both the shafts were backfilled with shale and both have a reinforced concrete cap constructed in 1970. A copy of the Shaft Plan and Data sheets are included in Appendix C.

4.16 Mine abandonment plans from the coal authority include shaft borehole records of the site, indicating that the shafts identified are up to 6.4m diameter and are referenced as west and east shaft. A further shaft was also sunk further to the east of the site to access coal at deeper depths including the Rock Vein. The shaft records also indicates a superficial material thickness of 11 yards (10.9m).

4.17 The mining abandonment plans also show the extent and depth of the working associated with each seam located in the shaft records. Copies of the mine abandonment plans are

given in Appendix D. Based on these the workings are shown at depths in excess of 150m depth and associated the Black Vein, Meadow Vein, Rock Vein, Big Vein, and Lower Black Vein all of which are below 150m depth. Historical information indicates that the colliery is shown as disused in 1964, which is why the coal mining report has reported as last workings date of 1962.

4.18 Further information was also collected from the BGS and includes two boreholes logs associated with the shaft records recorded by the Coal Authority. The records for the Coal Authority are clearer and have therefore been used instead. Copies of these shaft records/ logs are given in Appendix D. These logs confirm the presence of coal, with the Lower Black, Black and Meadow veins shown below 150m depth and being the main seams. A higher seam is also shown at depths of approximately 90m bgl however given the thickness less than one yard it is considered that this was not worked. This information ties up with the depth recorded in the Coal Mining report of approximately 150m bgl indicating that the lower seams have been worked.

4.19 Given the depth of the worked coal seams (in excess of 150m deep) and the thickness of the seams up to 2m thick, the recorded thickness of the superficial materials (11m) any collapse or Ground surface movements of these deeper workings should not affect the surface and any movement should have ceased.

4.20 The remaining risk is associated with the presence of the coal shaft within the site. It has been confirmed that these has been backfilled with shale and a reinforced cap constructed above the site. The positon of this shaft will need to be confirmed on site to allow a no built zone to be established around the shaft.

4.21 Based on the thickness of the superficial materials (11m) and the diameter of the shaft (6.5m) and a 45 degree repose angle from the superficial/ bedrock interface as recommended in Ciria Special publication 32 (Construction over abandoned mine workings) it is recommended that a 14.25m no construction zone is given from the centre of the shaft.

4.22 There has no recorded subsidence in the area.

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

Non Coal Mining and Cavities

4.24 There are no recorded non coal mining activities within 1000m of the site.

4.25 There are no recorded cavities within 1000m of the site.

Ground Workings

4.26 There are no active ground workings within 250m of the site.

4.27 The following historic ground workings are identified within 250m of the site:

Details	Distance	Notes
Colliery, refuse heaps, reservoir and old shafts	On site to 235m E	All are associated with the colliery and the regarding of the site and are of low risk to the site. A site investigation is required to confirm the thickness of the regarded Made Ground (former spoil heaps).
Disused quarry	240m E	Dismissed in the historical section based on distance to the site.

4.28 No new risks are identified from the ground workings.

Hydrology

4.29 There are no water courses on the site.

4.30 A Primary River called the River Sirhowy is located 73m south of the site. This was redirected in the 1970's from it former its former course within the south of the site. A river quality of this river has been recorded 1410m east downstream of the site with a general biological quality grade B (Good) in 2008 and a general chemical quality grade B (Good) in 2008.

4.31 Environment Agency records show that the site is not located within a flood zone.

Radon Risk Potential

4.32 The Groundsure GeoInsight Report indicates that the site is outside a Radon Affected Area therefore no protective measures are necessary.

Natural Hazards Finding

4.33 BGS information presented within the Groundsure Geoinsight report identifies the following Ground hazards:

Hazard	Risk Designation (Groundsure)
Coal Mining	Risk of instability identified
Collapsible Ground	Negligible to very low
Compressible Ground	Negligible to moderate to high.
Ground Dissolution	Null.
Landslide	Very Low.
Running Sand	Very Low to Low.
Swelling / Shrinking Clay	Negligible to Very low.

4.34 The moderate risk of compressible ground is associated with the cohesive nature of the Alluvium.

4.35 There are no further geotechnical ground risks which have not been described in the Coal Mining Section.

Sensitive Land Uses

4.36 The site comprises undeveloped land and is considered to be of low sensitivity.

4.37 English Heritage identifies no historical features on the site.

Industrial Land Uses

4.38 Industrial land uses within 250m of the site are limited to a Electric Substation which is not considered a significant risk to the site and light industrial uses associated with the surrounding Nine Mile Point Industrial estate.

4.39 The Groundsure EnviroInsight Report indicates that there are no open or closed fuel stations within 500m of the site.

4.40 No high pressure oil/gas pipelines within 500m of the site.

4.41 No new risks are identified from the register of industrial land uses.

5.0 CONSULTATIONS

Regulatory Database

5.1 The following information has been obtained from a commercially available environmental database.

Environmental Permits, Incidents and Registers	0 -250m	250-500m	Details
Site determined as contaminated land	0	0	Not applicable
Authorised industrial processes	0	0	Not applicable.
Registered radioactive substances	0	0	Not applicable.
Enforcements, prohibitions or prosecutions	0	0	Not applicable.
Pollution Incidents	2	0	207m E and 208m E Category 2 Significant risk to water and impact). Given distance no risk to the site.
Consents issued under the Planning (Hazardous Substances) Act 1990	0	0	Not Applicable.
Control of Major Accident Hazard (COMAH)/ Notification of Installations Handling Hazardous Substances (NIHHS) sites	0	0	Not Applicable.
Records of Licensed Discharge Consents	0	1	326m W Sewage discharge into Sirhowy River. There is a closer discharge however has expired 152m SE. No risk to the site.

5.2 No significant risks are identified from the regulatory data base.

Landfill Sites and Waste Treatment Sites

5.3 There are no operational or historic landfill sites within 500m of the site.

5.4 There are no operational and non-operational waste treatment, transfer or disposal sites within 500m site.

5.5 No significant risks are identified from waste activities.

6.0 PRELIMINARY CONCEPTUAL MODEL

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, metals and hydrocarbons.	Potential Made Ground on site from regarding exercise and colliery spoil.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal construction PPE will address risk under CDM.
			Site users.	Low	Made Ground on site likely to be inert.
Hydrocarbon and metals.	Migration from off-site sources.	Ingestion dermal and inhalation.	Construction Workers.	Low	Made ground surrounds site associated with regarding exercise.
			Site users.		
Ground Gas.	Historic Landfills.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
	Made Ground.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No confined access likely.
			Site users.	Negligible.	Unlikely to be significant highly putrescible matter.
	Mine gas	Inhalation & Explosive.	Construction Workers.	Dismissed.	No confined access likely.
			Site users.	Negligible.	Given the shaft has been backfilled and treated it is unlikely there will be a risk associated with mine gas.
Groundwater					
Hydrocarbon and metals.	Potential spillage on site.	Vertical Migration.	Groundwater.	Negligible.	Significant source unlikely. No evidence of spillages.
Surface Water					
Hydrocarbon and metals.	Potential spillage on site.	Horizontal Migration.	River Network.	Negligible	Significant source unlikely. No evidence of spillages.
Environmental Receptors					
On site contaminants	Ingestion dermal and inhalation.		Ecology.	Dismissed.	No sensitive ecology designation.
	Direct.		Archaeology.	Dismissed.	None present.
	Direct.		Geology.	Dismissed.	None present.
	Phytotoxic.		Woodland.	Dismissed.	None present.
	Phytotoxic.		Crops.	Dismissed.	None present.
	Ingestion dermal and inhalation.		Livestock.	Dismissed.	None present.
Building Services					
On site contaminants	Direct.		Historic Buildings.	Dismissed.	No receptors
	Direct.		Proposed Buildings.	Dismissed.	No source identified.
	Permeate into pipework.		Water Pipes.	Dismissed.	No source identified.

6.1 There is a low risk of Made Ground on the site associated with the regarding exercise, however there is a low sensitive end use of the site.

6.2 There is a negligible risk of Mine gas given that the mine shaft has been infilled with shale and a reinforced cap.

7.0 SITE INVESTIGATION

General

7.1 A ground investigation was undertaken by Enzygo Limited in April 2015.

7.2 Locations of exploratory holes advanced by Enzygo Limited are presented on Drawing CRM.083.0001.GE.D.001.

7.3 Site works were undertaken using Trial Pits (TP1 to TP17). The scope of the investigation works are outlined below:

Rational	Exploratory Holes	Notes
Mine shaft location	TP1	Six pits down around TP1 to located mine shaft concrete cap
Soakaway	TP3	Deep soakaway
Site coverage and thickness of Made Ground	TP1 to TP17	
Soakaway test from existing soakaway	Existing soakaway	To determine if water still soaks away

7.4 The density of granular soils and shear strength of the soils was based on visual inspection of the trial pits. The trial pit logs presented in Appendix B.

7.5 Representative soil samples were collected for chemical and geotechnical testing. Soil samples destined for chemical analysis were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.

7.6 Generally samples were collected from Made Ground, which may contain potential inclusions of contaminating materials and also materials displaying evidence of potential contamination.

7.7 In the absence of any evidence of contamination samples were collected near surface as this material is more likely to be contaminated by surface spillages and also will potentially be in contact with future residents.

Laboratory Testing

7.8 Samples for geotechnical testing were sent to the laboratories of GSSL, which is UKAS accredited, for the following analysis:

- Particle Size Distribution; and,
- Soluble sulphate and pH.

7.9 Samples for chemical analysis were sent to the Environmental Laboratories Ltd who are NAMAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, banded Total Petroleum Hydrocarbon (TPH) and asbestos screen. Two stage WAC tests were also undertaken to assist with waste classification.

7.10 A soakaway test was carried out in trial pit TP03 and below the Made ground proved to a depth of 3.85mbgl at this location. A further soakage test was undertaken in an existing soakaway located in the vicinity of trial pit TP5. The results of the soakaway tests are given in Section 8.

8.0 GROUND AND GROUNDWATER CONDITIONS

Summary of Ground and Groundwater Conditions

8.1 Ground and groundwater conditions have been assessed by Enzygo Limited investigation. The investigation undertaken confirm the published geology and identify the following strata:

Strata	Summary Description	Thickness (m)
Made Ground.	Grass over (soft) black occasionally slightly gravelly sandy clay with frequent roots. Gravel is generally fine to medium angular to sub angular sandstone.	0.15 to 0.40
Deeper Made Ground	Up to three layers of black and grey and light grey brown sandy gravel with timber props up to 1.50m long, brick, concrete Sandstone blocks, ash and clinker. (general colliery waste)	2.30 & 3.40 to in excess of 3.85
Superficial materials	Light grey locally dark grey slightly sandy clayey subrounded and sub angular GRAVEL.	0 to 6.0
Groundwater.	Groundwater was not encountered	

8.2 Details of the ground and groundwater conditions encountered are given on the exploratory hole records included in Appendix B and are summarised in the sections below:

Made Ground

8.3 Made Ground was encountered across the site and was noted to comprise a soft layer of topsoil, like materials comprising soft black occasionally slightly gravelly sandy clay with frequent roots. Gravel is generally fine to medium angular to sub angular sandstone.

8.4 The material appears to be comprise a topsoil like cover above colliery waste.

8.5 Colliery waste was encountered blow the surface topsoil like materials. These materials were proved to depths ranging from 3.85m bgl to in excess of 4.00mbgl and comprised up to three layers of black and grey and light grey brown sandy gravel with timber props up to 1.50m long, brick, concrete, sandstone blocks, ash and clinker. A number of potential obstructions were encountered within these materials comprising sandstone blocks, cobbles boulders, concrete blocks and abandoned timber props up to 1.50m long. These materials are consistent with backfilled colliery waste which has been used to raise ground levels.

8.6 No significant organic material was noted within the Made Ground. Some fine roots were noted within the upper cap materials and resulting from the existing vegetation on the site.

Mine shaft

8.7 A concrete mine shaft was encountered on the site at a depth of 0.25m bgl and covered an approximate area of 15m by 15m. This is located in the area in the vicinity Trial Pit TP1 and where it was expected. The extent of the mine cap has been marked on site by four number 1m post one in each corner.

Glacial Fluvial materials

8.6 Natural soils were noted to comprise medium dense to dense Light grey locally dark grey slightly sandy clayey subrounded and sub angular fine to coarse gravel and cobbles of sandstone

8.7 These materials were only encountered in two trial pits TP03 and TP09 due to the extensive thickness of the Made Ground across the site.

8.8 Ground conditions encountered on site were similar to those identified from the shaft record.

Visual and Olfactory Evidence of Contamination

8.9 No visual or olfactory evidence of contamination was encountered with the exception of ash and clinker associated with the colliery waster Made Ground and no organic material was noted within the natural soils.

Soil Strength

8.10 Consistency of soils has been assessed using a visual inspection from the trial pits with the Glacial fluvial materials being estimated as being loose to medium dense.

Groundwater

8.11 Groundwater was not encountered

Gas

8.12 Ground gas was being monitored from the adjacent site during the investigation resulting from the high methane being recorded. Given this further investigation will be required to

confirm the gas regime across the site and it is likely that gas protection measures will be required for the hardstanding areas and the proposed building.

Soakaways

8.13 A full BRE 365 Soakaway test was undertaken in trial pit TP03 which gave a soil infiltration value of 1.9E-03m/s and from below 4.00m bgl within the sandy gravel (Glacial fluvial materials). The soakage test undertaken in the existing soakaway indicated that 2000 litres of water disappeared within 5mins indicating a similar soil infiltration rate as the trial pit soakaway recorded in Trail Pit TP03.

9.0 CONTAMINATION ASSESSMENT

General

9.1 A Tier I risk assessment has been undertaken using available and current screening values for human health and where appropriate controlled waters. The risk assessment is undertaken based on the findings of the preliminary conceptual model presented in Section 6. Based on the contamination testing and Tier I assessment a revised Conceptual Model has been prepared, which is presented later in this section.

9.2 Where significant risks are identified remedial measures are recommended.

Human Health

9.3 Assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM/CIEH. The LQM/CIEH S4ULs values are used and summary tables of the reference values are included in Appendix C.

9.4 Where an exceedance is identified the risk is assessed by considering the sensitivity of the proposed development and the potential pathway. The proposed development is for a proposed SRF (solid Recovered fuel)/ RDF (refuse derived fuel production facility. As such the GAC values for Commercial Use are used.

9.5 Results of the chemical testing are included in Appendix C.

9.6 The soil quality analysis does not show any exceedances of the reference values for commercial end use. No asbestos fibres were detected.

Controlled Waters

9.7 Where groundwater samples have been analysed the results are compared against reference values. These reference values are summarised in Appendix C and are taken from Fresh Water Environmental Quality Standards (EQS), UK Drinking Water Standards and World Health Organisation (WHO) values for Drinking Water.

9.8 Where the controlled waters receptor is a surface water course then the EQS are used as the primary reference value. Drinking Water Standards and WHO values are used where EQS values are not available. An assessment of likely risk is then made based on a source-

pathway-receptor model. Where the receptor is potable groundwater resources the Drinking Water Standards and WHO values are used.

9.9 The risk to surface water and groundwater resources was negligible within the Preliminary Conceptual Model and no new risks or sources or exceedances of the GAC have been identified and therefore the risk is dismissed.

Ground Gas

9.10 Following the guidance provided in CIRIA C665 an initial assessment is undertaken to determine if there are any significant sources of potential ground gas. Such sources include landfills, organic clays and made ground incorporating putrescible materials such as rags, paper and wood. Where no significant source is identified no further assessment is necessary.

9.11 Where significant potential risk from ground gas has been identified from the Initial Conceptual Model and the intrusive ground investigation works ground gas monitoring is undertaken and the results of the monitoring are compared against the Gas Screening Values given in CIRIA Report 665. From this the Characteristic Situation is identified and remedial measures proposed.

9.12 When assessing the risk and type of remedial measures appropriate consideration is given to the likely construction of the development, the nature of the gas posing a risk and the nature of the likely source. The use of engineering judgement when determining risk from ground gas is consistent with the recommendations given in CIRIA C665.

9.13 The only risk identified in the desk study was the potential for mine gas from the mine shaft. Records on site and from the Coal Authority indicate that this has been infilled and capped appropriately and therefore eliminating the gas risk. Furthermore no significant sources of ground gas were noted on the site and the Made Ground did not contain any putrescible materials.

9.14 Based on this the gas risk should be dismissed, however whilst on site it was noticed that the adjacent site was being monitored and levels of methane were being recorded from underneath the car park. In order to confirm the gas risk to the site it is therefore recommended that as part of the borehole exercise required for piling that gas monitoring is undertaken from these boreholes.

Revised Conceptual Model

9.16 The Initial Conceptual Model presented in Section 6 has been revised based on the findings of the ground investigation and the revised Conceptual Model is presented below:

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Metals and hydrocarbons	Unforeseen contamination	Ingestion dermal and inhalation.	Construction Workers.	Dismissed	Normal construction PPE will address risk under CDM.
			Site users.	Negligible	Discovery Strategy.
Asbestos, metals and hydrocarbons.	Made Ground on site.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No exceedance of GAC.
			Site users.		
Hydrocarbon and metals.	Migration from off-site sources.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
Ground Gas.	Historic Landfills.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
	Potential Made Ground on site.		Site users.		
Mine gas	Mine Gas		Construction Workers.	Negligible	Further investigation required.
			Site users.		
Groundwater					
Hydrocarbon and metals.	Potential spillage on site.	Vertical Migration.	Groundwater.	Dismissed.	No source.
Surface Water					
Hydrocarbon and metals.	Potential spillage on site.	Horizontal Migration.	River Network.	Dismissed.	No source.
Environmental Receptors					
On site contaminants		Ingestion dermal and inhalation.	Ecology.	Dismissed.	No sensitive ecology designation.
		Direct.	Archaeology.	Dismissed.	None present.
		Direct.	Geology.	Dismissed.	None present.
		Phytotoxic.	Woodland.	Dismissed.	None present.
		Phytotoxic.	Crops.	Dismissed.	None present.
		Ingestion dermal and inhalation.	Livestock.	Dismissed.	None present.
Building Services					
On site contaminants		Direct.	Historic Buildings.	Dismissed.	No receptors.
		Direct.	Proposed Buildings.	Dismissed.	No sources identified.
		Permeate into pipework.	Water Pipes.	Negligible	Hydrocarbons encountered. Verification required by local authority on pipe classification for new pipes.

Remediation and verification Strategy

9.17 No remediation is proposed. Hydrocarbons have been encountered which may require the use of protectoline or ductile iron water pipes. Methane has been encountered in the adjacent site. Gas monitoring is required to confirm gas protection requirements.

9.18 If unforeseen contamination is encountered during construction works such as localised spillage outside the areas investigated an Environmental consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered the discovery strategy will be to remove the source as it is likely to be very limited in extent and the Local Planning Authority advised.

Waste Classification

9.19 Two part WAC tests have not been undertaken.

9.20 No elevated TPH or PAH concentrations have been encountered above the threshold for inert waste. Based on the initial chemical results it is likely that the materials will be classified as inert however the landfill will require WAC testing in order to classify the materials for offsite disposal.

9.22 The Waste Management Paper 2 has recently been updated to version 3 which states that that sites which previously could be considered 'uncontaminated land' surplus soils if they did not exceed the GAC values now requires the landfill to make an appropriate assessment of the waste classification. As such final assessment will be undertaken by the receiving landfill based on the requirements of their permit.

10.0 GEOTECHNICAL ASSESSMENT

Proposed Development

10.1 The proposed development will comprise a SRF (solid Recovered fuel)/ RDF (refuse derived fuel production. The structural loading is not known and is assumed to be 100kN per/metre run for assessment purposes.

10.2 It is considered that the scheme meets the criteria of Geotechnical Category 1 of Eurocode 7.

Ground Conditions

10.3 Ground Conditions comprise variable thickness of Made Ground proved to in excess of 4.00m bgl over loose becoming medium dense sandy gravel over Coal measures sandstone. The sandstone has not been proved in this investigation however is thought to be 11.00mbgl based on the shaft records from the Coal Authority.

Site Preparation

10.4 The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works. This should include:

- Any redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill;
- Any old roots, although none were encountered during the site investigation; and,
- Any buried structures and old foundations encountered on site should be excavated from below the proposed structures with the resulting void backfilled.

Foundations

10.6 Based on the Coal Mining report and given the depth of the working in excess of 150m, shaft data sheets and mine abandonment plans the risk from shallow workings affecting the foundations can be dismissed.

10.7 The presence of the mine shaft cap has been proved and confirmed on site as being outside the area of influence from the proposed buildings. This location is where the Coal Mining Report and historical plans have drawn the mine shaft. Based on the location of the shaft

compared to the proposed position of the building it has been concluded that the edge of the mine cap is not within 11 metres of the proposed buildings and therefore outside the area of influence. This should however be confirmed by surveying in the positions of the edge of mine shaft as plotted out on site and marked by four number 1m posts.

10.8 Given that the risk from shallow coal mining and the mine shaft affecting foundations has been dismissed and given the thickness of the Made Ground piled foundations are proposed. It is recommended that these are driven into the underlying medium dense gravels proved below 3.50m in one location. The shaft records identified rockhead at a depth of 11mbgl. Trial pits confirmed that the Made Ground extends to in excess of 4.00m bgl, which has locally been proved to 3.50mbgl in trial pit TP03 and 2.40m bgl in Trial Pit TP09.

10.9 Based on this investigation and the shaft records it is likely that piles will extend to depths from 8m to 11m or socket into the underlying rock, however piling contractors will require more information and it is recommended that 4 deep boreholes are sunk across the site to provide piling parameters, depths of the Made Ground, superficial materials and rock head together with strength tests.

10.10 Given the presence of timber props up to 1.50m long localised obstructions may be expected within the Made Ground which will require pre drilling or pre excavation works to allow piling.

Ground Floor Slab

10.11 Given the thickness of Made Ground identified a piled floor slab is recommended.

Fill Materials and Re-use

10.12 An assessment of the existing Made Ground and underlying sub formation has been undertaken using the following:

- Consistency of the fill;
- Moisture content and classification limits; and
- Description of the soils.

10.13 Given the presence of ash, clinker and timber within the Made Ground. No significant evidence of organic material was noted within the fill or natural soils and no evidence of relict topsoil was noted. This indicates that existing topsoil was stripped in accordance with good practice.

10.14 Given the presence of detritus (timber props) within the Made Ground these materials are not suitable as engineering fill.

Pavement Construction

10.15 An assessment of the likely California Bearing Ratio (CBR) has been assessed from the following sources:

- Description of the materials encountered in the exploratory holes; and
- Guidance given in HD25/94 and 73/06.

10.16 Based on this it is recommended that an equilibrium design CBR of 20% is used. Soils are not considered frost susceptible. The formation should be proof rolled and any areas of loose/soft material excavated and removed.

Drainage

10.17 Based on the presence of Made Ground to in excess of 4.00m bgl. Soakaways are recommended below this depth with a soil infiltration rate value of 1.9E-03m/s. the existing soakaway on the site was assessed for soakage and 2000 litres of water soaked away within 5mins indicate that this soakaway is suitable.

10.18 Chemical results should be provided to the water authority to confirm the design of potable water supply pipes.

Buried Concrete

10.19 Results of the sulphate testing indicate that soils have soluble sulphate concentrations of less than 0.5 g/l consistent with DS1 Conditions of BRE Special Digest 1 and as such buried concrete may be designed in accordance with ACEC Class AC-1s.

Excavation

10.20 Based on the various site observations it is considered that excavations should be feasible with normal plant, however localised cobbles of sandstone, concrete and timber props have been encountered which could result in refusal.

10.21 Excavations where access is required should be supported in accordance with CIRIA RR97.

10.22 Groundwater seepages have not been encountered, however dependant on the time of construction localised per4ched groundwater may be expected in the Made Ground but it should be possible to deal with these through sump pumping.

11.0 FURTHER WORKS

Further Works

11.1 Based on the ground investigation undertaken it has been concluded that due to thickness of Made Ground that a piled foundation is required which will required deep boreholes to prove piling parameters beyond the depth of the current investigation trial pitting.

11.2 Similarly whilst carrying out the site works a potential ground gas issue was observed in the adjacent site, and although there is no evidence of gas generating materials within occur site it is recommended that installations should be monitored from the boreholes on three occasions.

11.3 The mine shaft cap has been proved on site, however it is recommended that this mine shaft cap in surveyed in so it can accurately demonstrated that this mine shaft cap does not affect the proposed building and at least 11m away.

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hazrem Environmental Ltd

SCALE: 1:1,000@A3

PROJECT REF: CRM.083.001

DRAWN: MG

CHECKED: RH

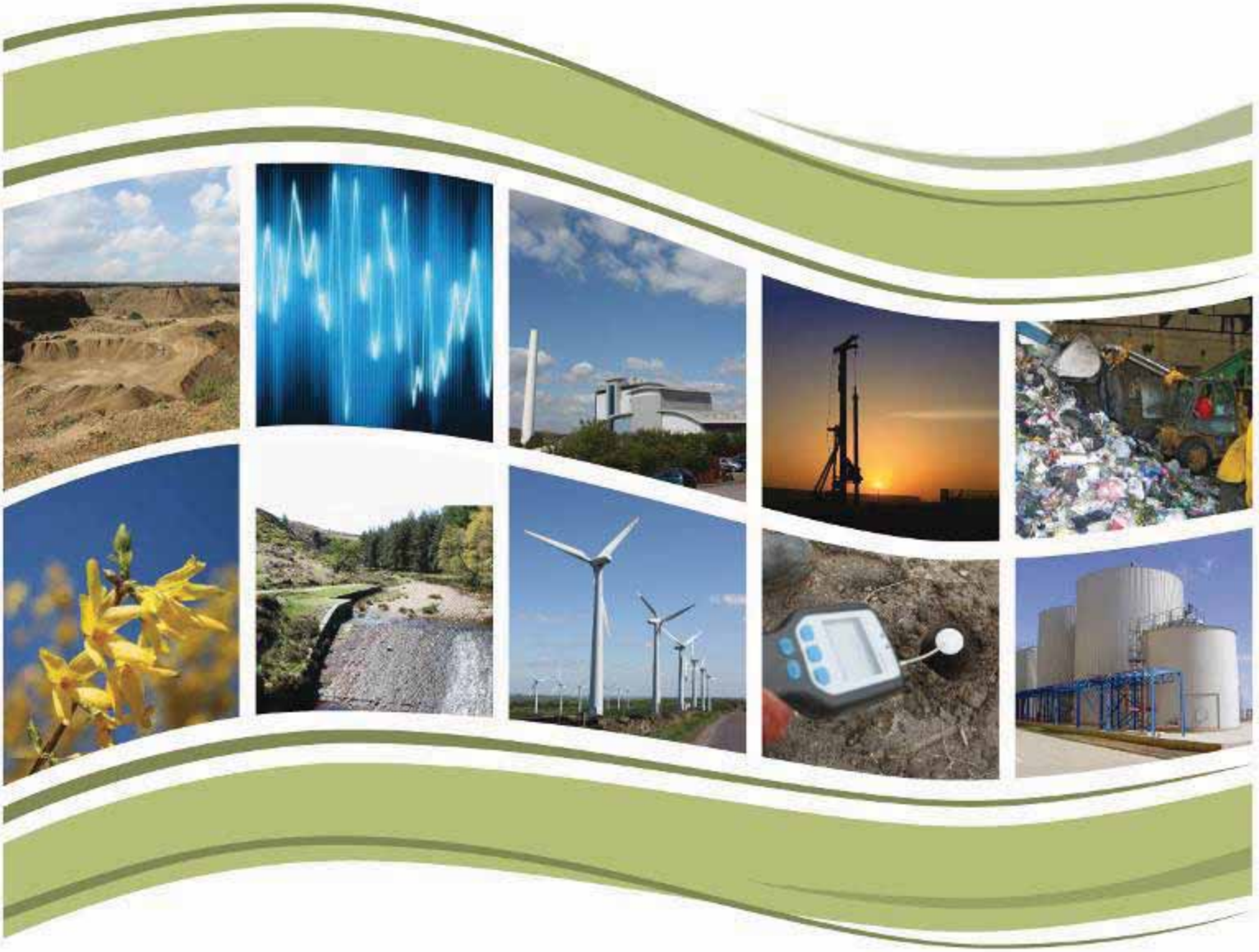
DATE: May 2015

PROJECT: Nine Point Mile

TITLE: Site Location Plan

FIGURE NO: CRM.083.001.GE.D.001

enzygo
environmental consultants



Phase I Environmental and Mining Report

Land at Nine mile Point Industrial Estate, Caerphilly, NP11 7HZ.

For

Hazrem Ltd

'Experience and expertise working in unison'

www.enzygo.com

Contact Details:

Enzygo Ltd.
The Granary
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

tel: 01454 269237
fax: 01454 269760
email: steve.rhodes@enzygo.com
www: enzygo.com

Phase I Environmental and Mining Report

Project:	Land at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ
For:	Hazrem Ltd
Ref:	CRM.414.002 GE R 0001
Status:	Final
Date:	April 2015
Author:	Richard Hamilton – **Associate Director**
Reviewer:	Steve Rhodes - **Technical Director**

Enzygo Limited Registered in England No. 6525159
Registered Office Stag House The Chipping Wotton-Under-Edge Gloucestershire GL12 7AD

TABLE OF CONTENTS

1.0 INTRODUCTION

Background

1.1 Enzygo Limited has been commissioned by Hazrem Ltd to prepare a Phase I Environmental and Mining Report for a proposed SRF (solid Recovered fuel)/ RDF (refuse derived fuel production facility, at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ.

Proposed Development

1.2 An initial existing site Layout plan has been provided. This has been incorporated into the site location plan included in the Drawing section of this report.

Objectives

1.3 The objectives of the study are to:

- Review historical plans, geology, hydrogeology, site sensitivity, and mining records in order to complete a Desk Study. A Groundsure report has been provided, a copy of which is included in Appendix A;
- Review the coal mining report and mine abandonment plans for the site. Copies of which are given in Appendix B;
- Review available BGS logs for the site and the surrounding area. Copies of which are given in Appendix C;
- Assess the implications of any potential geotechnical risks and development constraints associated with the site in relation to the future use of the site; and
- Provide a factual and interpretative report relating to the desk study.
- Provide preliminary geotechnical recommendations and initial assessment of ground engineering considerations.

Risk Classification

1.4 Where adverse risks from ground instability are identified these are discussed within the report.

2.0 SITE SETTING

Site Description

Item	Description
Site Address	Land at Nine Mile Point Industrial Estate, Caerphilly, NP11 7HZ
National Grid Reference	Centre of the site ST 1922691293.

Current Site Description

2.1 The following site description has been compiled from the current maps and aerial photographs.

2.2 The site is currently undeveloped and has a number of trees and vegetation within and around it.

2.3 The western edge containing trees is raised upon a bank, the rest of the site is relatively flat with small undulations.

2.4 There site is bordered by an industrial unit to the east and roads to the south and west.

2.5 Across the road to the west there are a number of industrial units and a car park.

2.6 To the north and south of the site across the adjacent road is an area of woodland.

2.7 The Sirhowy Rivers runs parallel to the southern boundary of the site beyond the woodland.

2.8 A area of gravel located on the site is understood to be former soakaway.

2.9 To the north of the site there is coal shaft. Base on the walkover this may be marked by a change in vegetation.

Surrounding Area

2.10 Land uses surrounding the site are summarised as follows:

Direction	Land Use
South	Road, Woodland and River.
East	Industrial units and a car park.
West	Road and industrial units.
North	Road and woodland.

2.11 The geotechnical risks for the site are associated with the disused mine shaft located within the northern section of the site and the adjacent mine shaft located to the north east of the site and the potential Made Ground across the site associated with the spoil from the mine. .

3.0 SITE HISTORY

3.1 A review of historical Ordnance Survey maps and information pertinent to the site and within a 250m radius is summarised below:

Potentially Contaminative Historical Land Use		
Map Edition	**Site**	**Surrounding Area**
1879-1901	North part of the site is shown as woodland. A Tramway is shown dissects the site from the east to the west. The southern part of the site and to the south of the tramway is open fields with four drains draining south into a further drain which drains south into the River Sirhowy located on the southern boundary of the site. A footpath is shown on the northern boundary of the site and trending west east across the site.	Unreferenced Road 50m N. Glan-yr-Afon Farm 20m S. Open fields surround the site. Railway shown 120m S.
1916-1920	The site comprises Nine Mile Point Colliery shown to the north of the site. A mine shaft is shown in the northern part of the site. Railway siding are shown to the south of the colliery buildings and central part of the site and spoil heaps to the south.	Old tramway shown 90m NE of the site connecting to two quarries the closest is 240m NE. The main Nine Mile Point Colliery buildings are shown 0m N and E. With two additional mine buildings within the site. These are thought to be associated with the mine shafts and the railway collection and delivery areas. Two further shafts are showing 10m E and 80m E. A water reservoir is shown 100m NW associated with the mine. Tanks are shown 50m NW.
1938-1948	No significant changes	Spoils heaps are shown to the south west of the site supplied by an aerial ropeway from the mine.
1960-1965	An additional building associated with the railway siding is shown in the central western part of the site. A drain is shown in the north western part of the site flowing to the east. Numerous spoil heaps and Made Ground are shown to the south of the site and in-between the main railway siding and building to the north and the river to the south. Pylons are shown coming into the site from the west. Google records indicate that the colliery closes in 1964.	The tanks are not shown. Further spoil heaps are shown on the former open filed and Glan-yr Afon farm 0m S of the site and are connected to the mine by aerial conveyors. The entire area to the south of the mine buildings up to in excess of 250m is shown as spoils heaps.
1974	No mine or shafts are shown. The entire site has been re-graded and is shown as level site with a road embankment to the N and the stepped embankment to the south with track running west to east. The River Sirhowy has been diverted to be 50m S of the site. A track is shown to dissect the site from the NW to the E.	The areas has been re graded to form a plateau between the road to the north and the newly diverted river coarse to the south.
1982	The track is not shown.	The eastern and southern boundaries of the site are shown by roads. The previous track is no longer shown. The undeveloped parcel of land to the east of the site which was also re-graded as part of the redevelopment works is now occupied

		by three factories.
1988	Site is shown as part of the Nine Mile Point Industrial Estate	The eastern road is shown as Green Meadow road and the southern road shown as Heol Tir Ton. A new Industrial building with associated car parking to the north is shown 50m E of the site. An electrical substation is shown 50m SE of the site. Further industrial units are shown 100m E.
1993	No changes.	The industrial unit to the east has enlarged and now extends up to 0m E of the site. The Industrial unit to the west has also enlarged to the south and west.
2002	A small area of land on the eastern boundary of the site has been cornered off opposite the access road to the adjacent industrial estate on the western boundary of the site. Google images indicate the re graded land for the site has been subject to the drainage system which drains the site into a drain running down the eastern boundary of the site. Google images of the 2010 also show clearly differing vegetation growth indicating the possible position of a mine shaft cap underneath.	No significant changes
2010-2014	The small area of land shown on the western boundary of the site is not shown.	No changes

3.2 There is a low risk associated with the colliery 500m south of the site and any associated workings underneath the site. There is a moderate risk given the presence of a shaft on the site and a shaft close to the site. The colliery is shown as accessing the coal from shafts and not from the surface. It is therefore likely that the depth of the workings will be in excess of 30m at the site.

3.3 There is a low risk associated with the previous drains and tramway across the site given the considerable regarding of the site during the life time of the mine and the age of these features.

3.4 There is a low risk associated with the potential for Made Ground associated with spoil across the site being used as part of the re-grading exercise during the 1970's.

3.5 There is moderate risk associated with the backfill and/or treatment of the shafts which will require further clarification.

3.6 No other significant risks are identified.

4.0 ENVIRONMENTAL SETTING

Ground Conditions

4.1 The British Geological Survey (BGS) indicates that the site is underlain by the following geological sequence:

Geological Unit	Type	Description	Aquifer Classification
Drift.	Glaciofluvial Deposits. (northern section)	Sand and Gravel.	Secondary (A).
	Alluvium (southern section).	Clay, Silt, Sand and Gravel	Secondary (A).
Solid.	Birthdir Member.	Sandstone with mudstone and coal bands at depth.	Secondary (A).

4.2 Made Ground has not been recorded in the Groundsure information, however re-grading has been encountered across the site associated with the closure of the mine post 1964. It is therefore likely that substantial Made Ground is present across the site and this is likely to be associated with the spoil heaps from the mine.

4.3 There are no records of landslip within 500m of the site.

4.4 Records of background soil chemistry do not show any elevated concentrations, however this does not take into account the presence of Made Ground on the site.

4.5 BGS boreholes records for the site and the surrounding area indicate the presence of coal seams at depths ranging from 150m to 410m. Based on these records the coal seams range in thickness from 1m to 2m thick.

4.6 A fault line is shown to dissect the site from the north east to the south west. The displacement is unknown however it has been recorded in the shaft records for the mine.

Groundwater

4.7 The recorded permeability of the drift geology is very low to very high reflecting the variable nature of the materials with the low permeability reflecting the cohesive Alluvium and the high permeability reflecting the Glaciofluvial deposits. The recorded permeability of the solid geology depends on the classification as a sandstone, siltstone or mudstone and varies

accordingly from high to moderate and has fracture flow type. The permeability of the solid materials underneath the site are dominated by the sandstone and is generally high.

4.8 The Ground Sure Report shows the site to be outside of any Source Protection Zones.

4.9 There are no groundwater abstraction licenses within 500m of the site.

4.10 BGS records show the site to have a low risk to groundwater flooding based on geological conditions. Historically this is likely to be associated with the Alluvium and the previous water-coarse to the south of the site, however the site has been subject to substantial land raising associated with the regarding of the site post mine closure.

Coal Mining

4.11 The ground sure report has identified coal working associated with the site. A coal mining report was obtained and is given in Appendix C. The Coal Mining report indicates that the site is underlain by 5 coal seams at shallow depths ranging from 150m to 410m depth and last worked in 1962 to 240m depth and last worked in 1962, which links to the collieries closure in 1964. The Coal Authority has concluded that any ground movements from these coal workings should have stopped.

4.12 The Coal Mining report indicates that there are two coal mine entries/shafts within 20m of the site.

4.13 The first shaft is located within the site (Ref 319191-0010) and was originally filled with washery shale in 1965 and covered with a reinforced cap in 1970.

4.14 The second shaft is located 10m east of the site (319191-002) was conveyed to Islwyn Borough council in 1971.

4.15 Further records obtained from the Coal Authority (Shaft Plan and data sheets) indicates that both the shafts were backfilled with shale and both have a reinforced concrete cap constructed in 1970. A copy of the Shaft Plan and Data sheets are included in Appendix C.

4.16 further records obtained from the Coal Authority and as part of the mine abandonment plan assessment obtained shaft borehole records of the site, indicating that the shafts identified are up to 6.4m diameter and are referenced as west and east shaft. A further shaft was also sunk further to the east of the site to access coal at deeper depths including the Rock Vein. The shaft records also indicates a superficial material thickness of 11 yards (10.9m).

4.17 The mining abandonment plans also show the extent and depth of the working associated with each seam located in the shaft records. Copies of the mine abandonment plans are

given in Appendix D. Based on these the workings are shown at depths in excess of 150m depth and associated the Black Vein, Meadow Vein, Rock Vein, Big Vein, and Lower Black Vein all of which are below 150m depth. Historical information indicates that the colliery is shown as disused in 1964, which is why the coal mining report has reported as last workings date of 1962.

4.18 Further information was also collected from the BGS and includes two boreholes logs associated with the shaft records recorded by the Coal Authority. The records for the Coal Authority are clearer and have therefore been used instead. Copies of these shaft records/ logs are given in Appendix D. These logs confirm the presence of coal, with the Lower Black, Black and Meadow veins shown below 150m depth and being the main seams. A higher seam is also shown at depths of approximately 90m bgl however given the thickness less than one yard it is considered that this was not worked. This information ties up with the depth recorded in the Coal Mining report of approximately 150m bgl indicating that the lower seams have been worked.

4.19 Given the depth of the worked coal seams (in excess of 150m deep) and the thickness of the seams up to 2m thick, the recorded thickness of the superficial materials (11m) any collapse or Ground surface movements of these deeper workings should not affect the surface and any movement should have ceased.

4.20 The remaining risk is associated with the presence of the coal shaft within the site. It has been confirmed that these has been backfilled with shale and a reinforced cap constructed above the site. The positon of this shaft will need to be confirmed on site to allow a no built zone to be established around the shaft.

4.21 Based on the thickness of the superficial materials (11m) and the diameter of the shaft (6.5m) and a 45 degree repose angle from the superficial/ bedrock interface as recommended in Ciria Special publication 32 (Construction over abandoned mine workings) it is recommended that a 14.25m no construction zone is given from the centre of the shaft.

4.22 There has no recorded subsidence in the area.

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

Non Coal Mining and Cavities

4.24 There are no recorded non coal mining activities within 1000m of the site.

4.25 There are no recorded cavities within 1000m of the site.

Ground Workings

4.26 There are no active ground workings within 250m of the site.

4.27 The following historic ground workings are identified within 250m of the site:

Details	Distance	Notes
Colliery, refuse heaps, reservoir and old shafts	On site to 235m E	All are associated with the colliery and the regarding of the site and are of low risk to the site. A site investigation is required to confirm the thickness of the regarded Made Ground (former spoil heaps).
Disused quarry	240m E	Dismissed in the historical section based on distance to the site.

4.28 No new risks are identified from the ground workings.

Hydrology

4.29 There are no water courses on the site.

4.30 A Primary River called the River Sirhowy is located 73m south of the site. This was redirected in the 1970's from it former its former course within the south of the site. A river quality of this river has been recorded 1410m east downstream of the site with a general biological quality grade B (Good) in 2008 and a general chemical quality grade B (Good) in 2008.

4.31 Environment Agency records show that the site is not located within a flood zone.

Radon Risk Potential

4.32 The Groundsure GeoInsight Report indicates that the site is outside a Radon Affected Area therefore no protective measures are necessary.

Natural Hazards Finding

4.33 BGS information presented within the Groundsure Geoinsight report identifies the following Ground conditions:

Hazard	Risk Designation (Groundsure)
Coal Mining	dismissed in the coal mining section.
Collapsible Ground	Negligible to very low
Compressible Ground	Negligible to moderate to high.

Ground Dissolution	Null.
Landslide	Very Low.
Running Sand	Very Low to Low.
Swelling / Shrinking Clay	Negligible to Very low.

4.34 The moderate risk of compressible ground is associated with the cohesive nature of the Alluvium.

4.35 There are no further geotechnical ground risks which have not been described in the Coal Mining Section.

Sensitive Land Uses

4.36 The site comprises undeveloped land and is considered to be of low sensitivity.

4.37 English heritage identifies no historical features on the site.

Industrial Land Uses

4.38 Industrial land uses within 250m of the site are limited to a Electric Substation which is not considered a significant risk to the site and light industrial uses associated with the surrounding Nine Mile Point Industrial estate.

4.39 The Groundsure EnviroInsight Report indicates that there are no open or closed fuel stations within 500m of the site.

4.40 No high pressure oil/gas pipelines within 500m of the site.

4.41 No new risks are identified from the register of industrial land uses.

5.0 CONSULTATIONS

Regulatory Database

5.1 The following information has been obtained from a commercially available environmental database.

Environmental Permits, Incidents and Registers	0 -250m	250-500m	Details
Site determined as contaminated land	0	0	Not applicable
Authorised industrial processes	0	0	Not applicable.
Registered radioactive substances	0	0	Not applicable.
Enforcements, prohibitions or prosecutions	0	0	Not applicable.
Pollution Incidents	2	0	207m E and 208m E Category 2 Significant risk to water and impact). Given distance no risk to the site.
Consents issued under the Planning (Hazardous Substances) Act 1990	0	0	Not Applicable.
Control of Major Accident Hazard (COMAH)/ Notification of Installations Handling Hazardous Substances (NIHHS) sites	0	0	Not Applicable.
Records of Licensed Discharge Consents	0	1	326m W Sewage discharge into Sirhowy River. There is a closer discharge however has expired 152m SE. No risk to the site.

5.2 No significant risks are identified from the regulatory data base.

Landfill Sites and Waste Treatment Sites

5.3 There are no operational or historic landfill sites within 500m of the site.

5.4 There are no operational and non-operational waste treatment, transfer or disposal sites within 500m site.

5.5 No significant risks are identified from waste activities.

6.0 PRELIMINARY CONCEPTUAL MODEL

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, metals and hydrocarbons.	Potential Made Ground on site from regarding exercise and colliery spoil.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal construction PPE will address risk under CDM.
			Site users.	Low	Made Ground on site likely to be inert.
Hydrocarbon and metals.	Migration from off-site sources.	Ingestion dermal and inhalation.	Construction Workers.	Low	Made ground surrounds site associated with regarding exercise.
			Site users.		
Ground Gas.	Historic Landfills.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
	Made Ground.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No confined access likely.
			Site users.	Negligible.	Unlikely to be significant highly putrescible matter.
	Mine gas	Inhalation & Explosive.	Construction Workers.	Dismissed.	No confined access likely.
			Site users.	Negligible.	Given the shaft has been backfilled and treated it is unlikely there will be a risk associated with mine gas.
Groundwater					
Hydrocarbon and metals.	Potential spillage on site.	Vertical Migration.	Groundwater.	Negligible.	Significant source unlikely. No evidence of spillages.
Surface Water					
Hydrocarbon and metals.	Potential spillage on site.	Horizontal Migration.	River Network.	Negligible	Significant source unlikely. No evidence of spillages.
Environmental Receptors					
On site contaminants	Ingestion dermal and inhalation.		Ecology.	Dismissed.	No sensitive ecology designation.
	Direct.		Archaeology.	Dismissed.	None present.
	Direct.		Geology.	Dismissed.	None present.
	Phytotoxic.		Woodland.	Dismissed.	None present.
	Phytotoxic.		Crops.	Dismissed.	None present.
	Ingestion dermal and inhalation.		Livestock.	Dismissed.	None present.
Building Services					
On site contaminants	Direct.		Historic Buildings.	Dismissed.	No receptors
	Direct.		Proposed Buildings.	Dismissed.	No source identified.
	Permeate into pipework.		Water Pipes.	Dismissed.	No source identified.

6.1 There is a low risk of Made Ground on the site associated with the regarding exercise

6.2 There is a negligible risk of Mine gas given that the mine shaft has been infilled with shale and a reinforced cap.

7.0 DISCUSSIONS AND RECOMMENDATIONS

Geotechnical Discussion

7.1 Based on the Coal Mining Report five coal seams have been encountered below the site at depths greater than 150m. This is supported by the BGS records, the shaft records and the mine abandonment plans/logs given in the appendices. The site is underlain by superficial materials up to 10.90m thick which is underlain by in excess of 90m of competent rock above even the shallowest coal seam. Given this there is considered to be no significant risk associated with collapse of mine working

7.2 Based on the historical information, the coal mining report, the shaft data report, historical plans and mine abandonment plans there is one shaft located on site and one 10m from the north eastern site boundary, both of which have been backfilled and capped with a reinforced cap in 1970. Given these have been treated the risk of collapsed mine shaft is dismissed, however it is recommended that a no construction zone is established around the shaft on the site.

7.3 Given the proposed usage of the site as SRF/RDF production plant with industrial load bearing structures and based on the thickness of the superficial materials and the shaft diameter it is recommended that these load bearing structures are sited 15m away from the centre of the shaft location.

7.4 In order to determine the position of the shaft accurately on site it is recommended that a site investigation is undertaken to determine the extent off the reinforced concrete cap and therefore the centre of the shaft. This exact extent of the reinforced cap position should be surveyed in so it can be placed on the site layout.

7.5 Given the depth of the working in excess of 150m and the evidence supplied by the Coal Authority and based on the coal mining report, shaft data sheets and mine abandonment plans no further deep rotary boreholes will be required to prove the depth of these workings.

7.6 Given the site has been subject to re-grading it is recommended that a site investigation is undertaken to determine the thickness and strength of the Made Ground in order to design appropriate foundations.

Environmental Discussion and Recommendations

7.7 It is considered that there is a negligible to low risk associated with land quality issues at the site. Given the proposed industrial usage of the site no remediation is expected.

7.8 If unforeseen contamination is encountered during construction works such as localised an Environmental consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered the discovery strategy will be to remove or cover the source using clean capping soils as it is likely to be very limited in extent and the Local Planning Authority advised.

Recommendations

7.9 It is recommended that an intrusive ground investigation is undertaken to determine the position of the mine shaft.

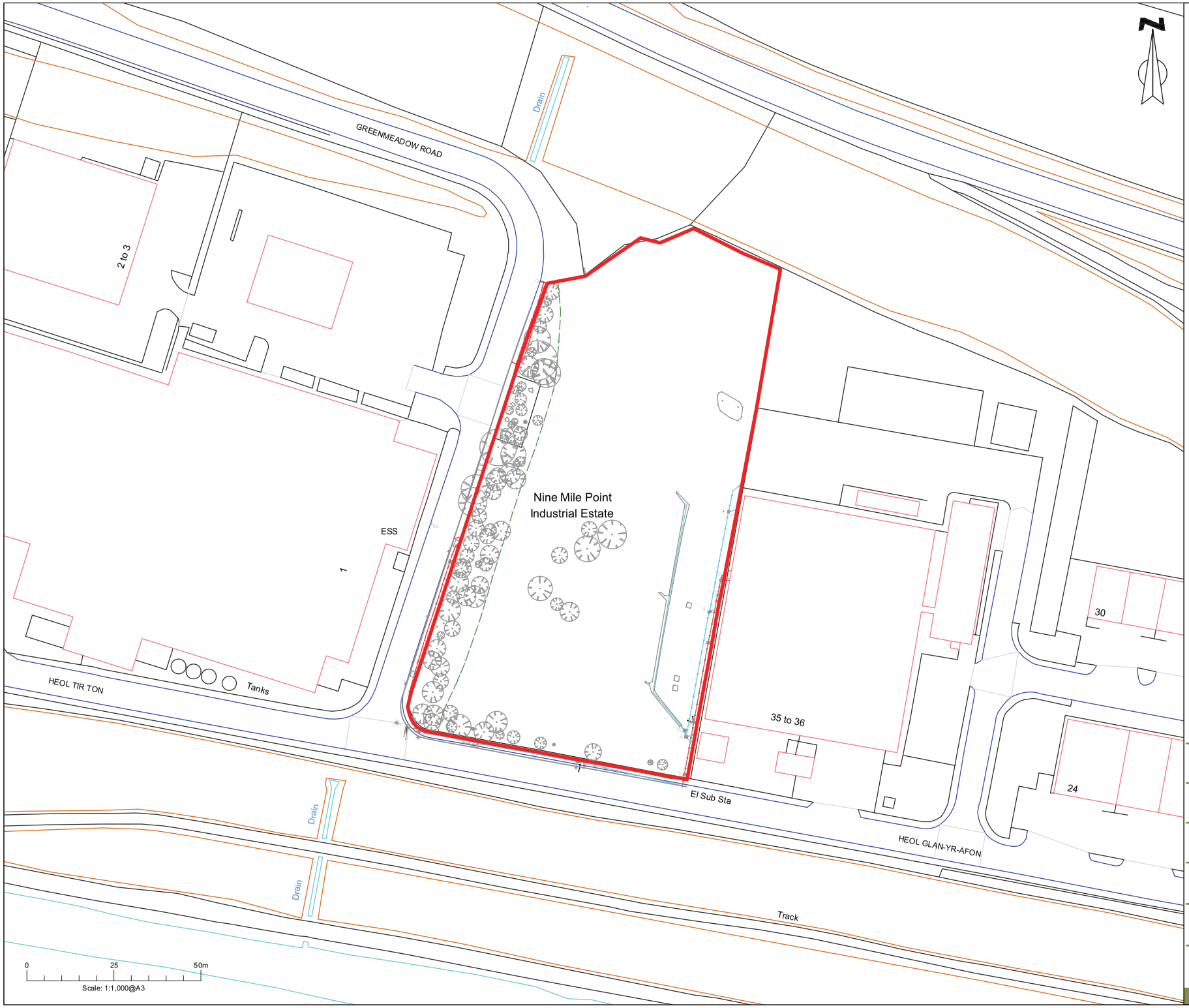
7.10 The intrusive investigation will also confirm the thickness of the superficial materials and depth to rock head.

7.11 Based on the desk study and the depth of the workings there is considered to be no risk of these workings affecting the proposed development.

7.12 It is considered that given the low/negligible risk from potential contamination. Appropriate environmental sampling should be undertaken to determine the soil quality.

7.13 The preliminary scope of the ground investigation proposed is given below:

- Carry out a trial pitting investigation and if required undertake deep boreholes to confirm the thickness of the Made Ground and superficial materials.
- Survey in the mine shaft position.
- Preparation of a geo-technical report based on the findings of the ground investigation providing geotechnical properties to assist with the development of the site. Provision of a 'discovery strategy' to address any localised contamination than may be encountered during site development works.



Key

Site Boundary

enzygo
environmental consultants

STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hazrem Environmental Ltd

SCALE: 1:1,000@A3

PROJECT REF: CRM.414.002

DRAWN: MG

CHECKED: BK

DATE: Mar 2015

PROJECT: Nine Point Mile

TITLE: Site Boundary Plan

FIGURE NO: CRM.414.002.D.001

The Coal Authority

Issued by:
The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0345 762 6848 DX 716176 MANSFIELD 5

ENZYGO LTD
THE GRANARY
WOODEND
WOTTON-UNDER-EDGE
GLOUCESTERSHIRE
GL12 8AA

Our reference:	**51000838643001**
Your reference:	**CRM.414.002 RP02**
Date of your enquiry:	**13 April 2015**
Date we received your enquiry:	**13 April 2015**
Date of issue:	**13 April 2015**

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

Shaft Plan and Data Sheets

5 NINE MILE POINT INDUSTRIAL ESTATE, CWMFELINFACH, NP11 7HZ

I refer to the enquiry dated 13 April 2015, received 13 April 2015, in connection with the above.

As requested I enclose the mine entry data sheet(s) held for the mine entry/entries referred to.

Mine Entry Data

Shaft/adit:	Shaft
Reference:	319191-001
Source:	1/2500 O.S Sheet 1920 Ed and ST1991 N.G Ed. Ab plans SWR568 SWR637 SWR6 39 SWR636 SWR638 SWR612 SWR919 SWR921 SWR1417 SWR3038 SWR3039 SWR3040 SW R3041 SWA3056 SWA3065 SWA3066 SWA3068 SWA3075 SWA3076.
Colliery name:	Unknown
Entry name:	Nine Mile Point - West Shaft
Date abandoned:	Unknown
Depth of superficial deposits (m):	Unknown
Depth of shaft (m):	359.0
Diameter of shaft (m):	6.5
Probable adit azimuth:	Not Applicable
Treatment details:	was originally filled with washery shale in 1965. Further works were undertaken in 1970 when a reinforced concrete cap was installed by Hayward Civil Engineering Ltd.
Conveyance:	8-SEP-1971 to Islwyn Borough Council
Easting:	319243
Northing:	191359
Other information:	None

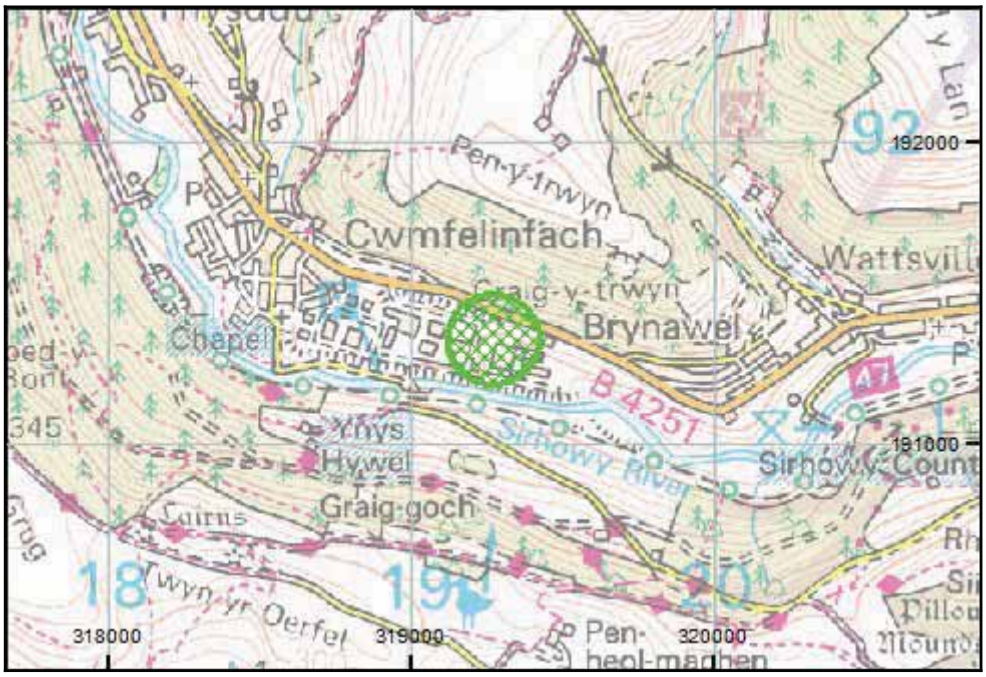
Mine Entry Data (continued)

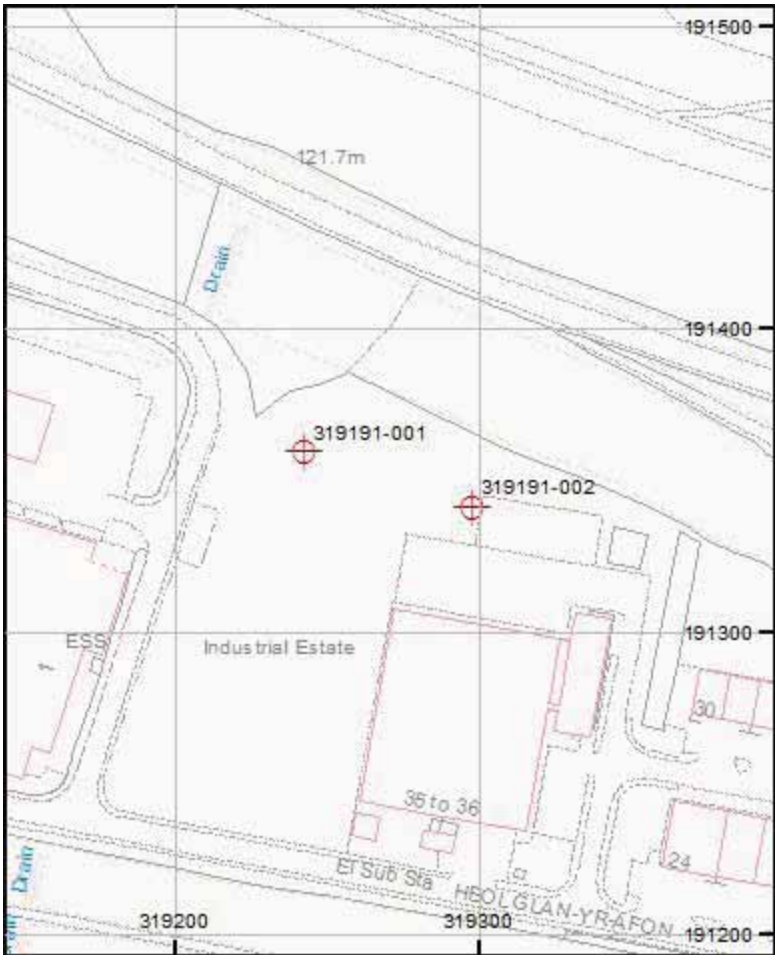
Shaft/adit:	Shaft
Reference:	319191-002
Source:	1/2500 O.S Sheet 1920 Spec Ed ST1991 N.G Ed. Ab plans SWR568 SWR637 SWR6 39 SWR636 SWR638 SWR612 SWR919 SWR921 SWR1417 SWR3038 SWR3039 SWR3040 SW R3041 SWA3056 SWA3065 SWA3066 SWA3068 SWA3075 SWA3076.
Colliery name:	Unknown
Entry name:	Nine Mile Point - East Shaft
Date abandoned:	Unknown
Depth of superficial deposits (m):	Unknown
Depth of shaft (m):	350.9
Diameter of shaft (m):	7.6
Probable adit azimuth:	Not Applicable
Treatment details:	was originally filled with washery shale in 1965. Further works were undertaken in 1970 when a reinforced concrete cap was installed by Hayward Civil Engineering Ltd
Conveyance:	8-SEP-1971 to Islwyn Borough Council
Easting:	319298
Northing:	191341
Other information:	None

Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Tax Point Date:	13 April 2015
Issued to:	ENZYGO LTD THE GRANARY WOODEND WOTTON-UNDER-EDGE GLOUCESTERSHIRE GL12 8AA
Property Search for:	5 NINE MILE POINT INDUSTRIAL ESTATE, CWMFELINFACH, NP11 7HZ
Reference Number:	51000838643001
Date of Issue:	13 April 2015
Cost:	£35.00
VAT @ 20%:	£7.00
Total Received:	£42.00
VAT Registration	598 5850 68

Location map

Approximate position of enquiry





This plan shows the approximate location of the disused mine entry / entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A DTI leaflet setting out the rights and obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0345 762 6848.

If you wish to discuss the relevance of any of the information contained in the attached report you should seek the advice of a qualified mining engineer or surveyor. If you or your advisor wish to examine the source plans from which the information has been taken these are available at our Mansfield office, free of charge by prior appointment, telephone 01623 637235. Should you or your advisor wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries).

Our emergency telephone number at all times is 01623 646333.

Key

Disused Adit or Mineshaft

Mapping sourced from Ordnance Survey

The Coal Authority

Issued by:
The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0345 762 6848 DX 716176 MANSFIELD 5

ENZYGO LTD
THE GRANARY
WOODEND
WOTTON-UNDER-EDGE
GLOUCESTERSHIRE
GL12 8AA

Our reference:	**51000808805001**
Your reference:	**CRM.414.002 RP01**
Date of your enquiry:	**24 March 2015**
Date we received your enquiry:	**24 March 2015**
Date of issue:	**24 March 2015**

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

Non-Residential Coal Authority Mining Report

5 NINE MILE POINT INDUSTRIAL ESTATE, CWMFELINFACH, NP11 7HZ

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

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

The property is in the likely zone of influence from workings in 5 seams of coal at 150m to 410m depth, and last worked in 1962.

Any ground movement from these coal workings should have stopped by now.

Present

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

Future

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

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

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

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

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

Mine entries

Within, or within 20 metres of, the boundary of the property there are 2 mine entries, the approximate positions of which are shown on the attached plan.

Our records disclose the following information:

319191-001. was originally filled with washery shale in 1965. Further works were undertaken in 1970 when a reinforced concrete cap was installed by Hayward Civil Engineering Ltd..
Mine entry 319191-001 was conveyed to Islwyn Borough Council in 1971.

319191-002. was originally filled with washery shale in 1965. Further works were undertaken in 1970 when a reinforced concrete cap was installed by Hayward Civil Engineering Ltd.
Mine entry 319191-002 was conveyed to Islwyn Borough Council in 1971.

For an additional fee, the Coal Authority will provide a supplementary Mine Entry Interpretive Report. The report will provide a separate assessment for the mine entry (entries) referred to in this report. It will give details based on information in the Coal Authority's possession, together with an opinion on the likelihood of mining subsidence damage arising from ground movement as a consequence of the existence of the mine entry/entries. It will also give details of the remedies available for subsidence damage where the mine entry was sunk in connection with coal mining.

Please note that it may not be possible to produce a report if the main building to the property cannot be identified from Coal Authority plans (ie. for development sites and new build).

For further advice on how to order this additional information visit www.groundstability.com or telephone 0345 7626 848.

Coal mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast coal mining

Past

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

Present

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

Future

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

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

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

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

Hazards related to coal mining

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

Withdrawal of support

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

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

Working facilities orders

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

Payments to owners of former copyhold land

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

Comments on Coal Authority information

The attached plan shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence act 1991*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0345 762 6848 or online at www.coal.decc.gov.uk/en/coal/cms/services/claims.

If you wish to discuss the relevance of any of the information contained in this report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are normally available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637235. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be

aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional Remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Tax Point Date:	24 March 2015
Issued to:	ENZYGO LTD THE GRANARY WOODEND WOTTON-UNDER-EDGE GLOUCESTERSHIRE GL12 8AA
Property Search for:	5 NINE MILE POINT INDUSTRIAL ESTATE, CWMFELINFACH, NP11 7HZ
Reference Number:	51000808805001
Date of Issue:	24 March 2015
Cost:	£59.00
VAT @ 20%:	£11.80
Total Received:	£70.80
VAT Registration	598 5850 68

Location map

Approximate position of property

Enquiry boundary

Key

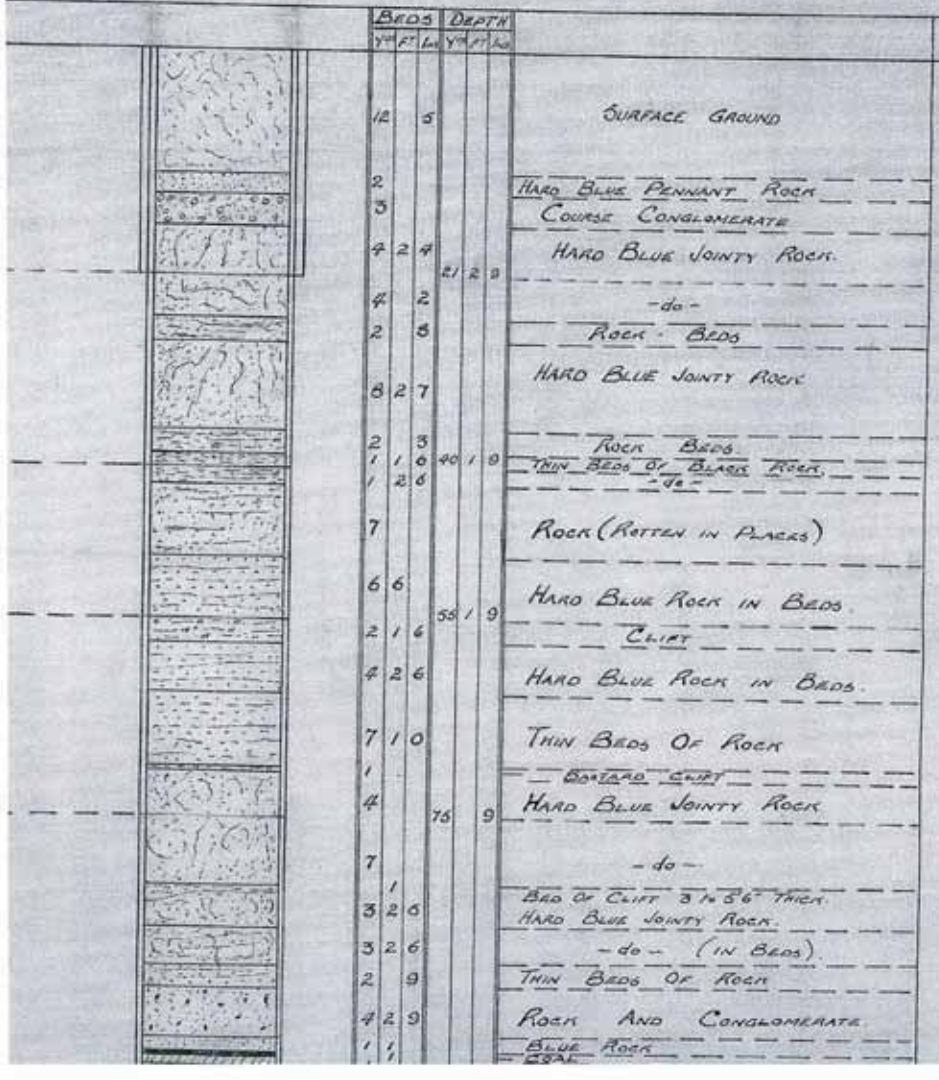
Approximate position of enquiry boundary shown

Disused Adit or Mineshaft

NINE MILE POINT COLLIERIES

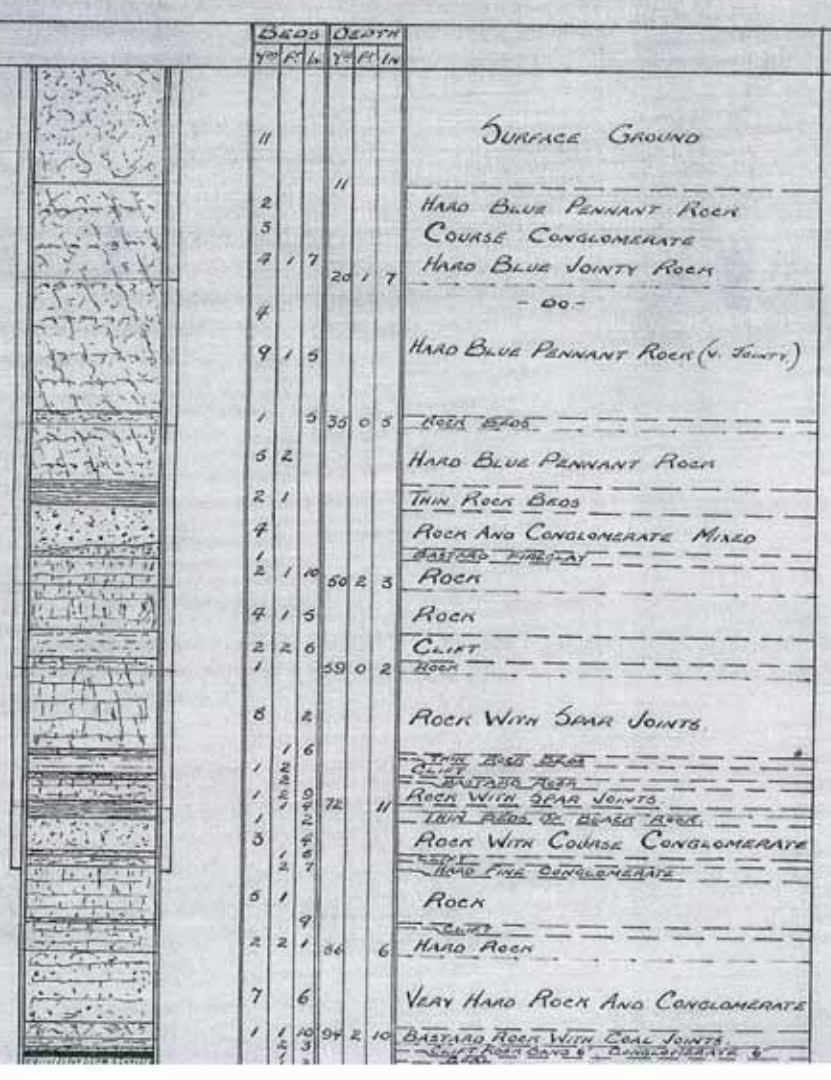
PIT SECTIONS

WEST PIT

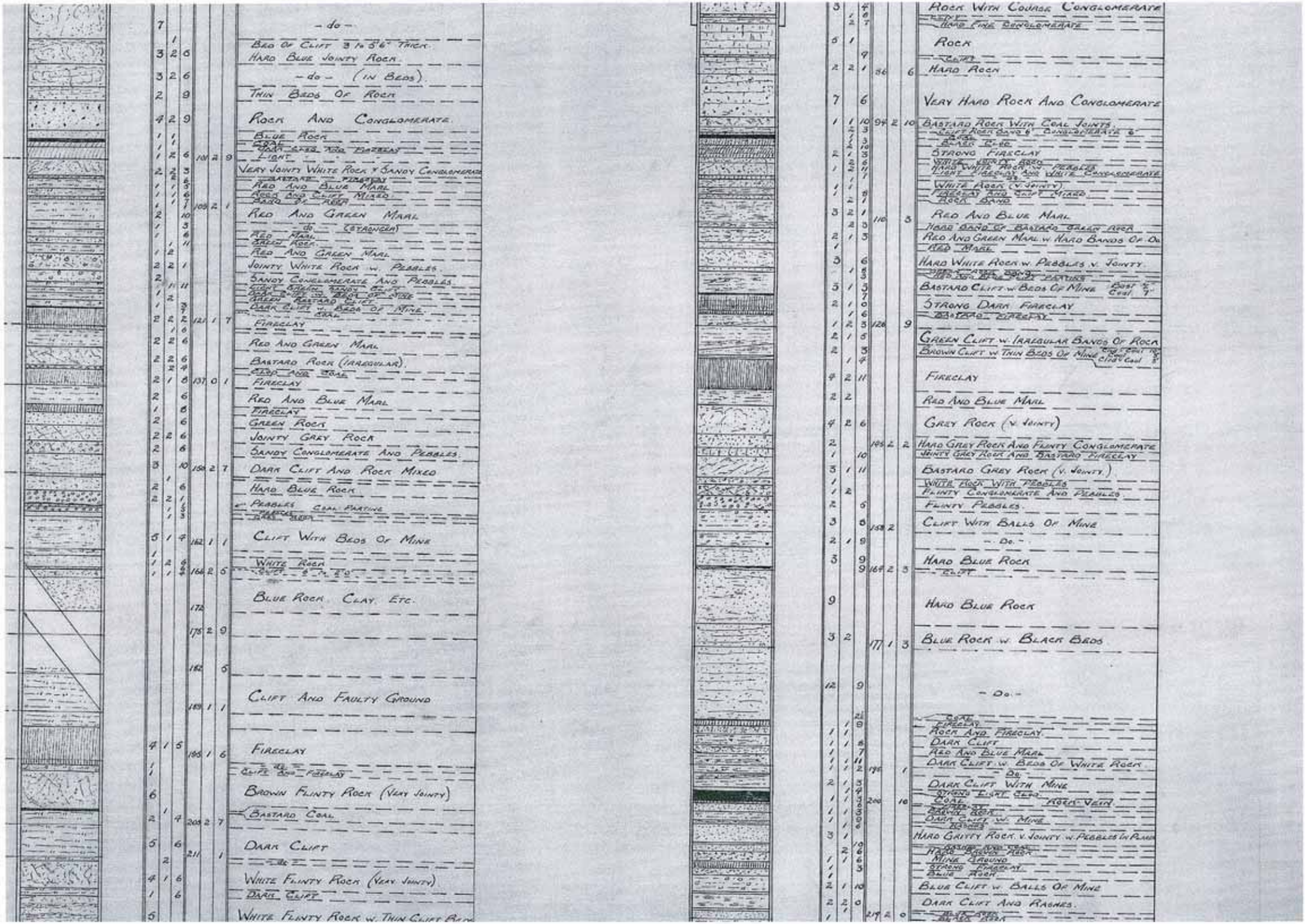


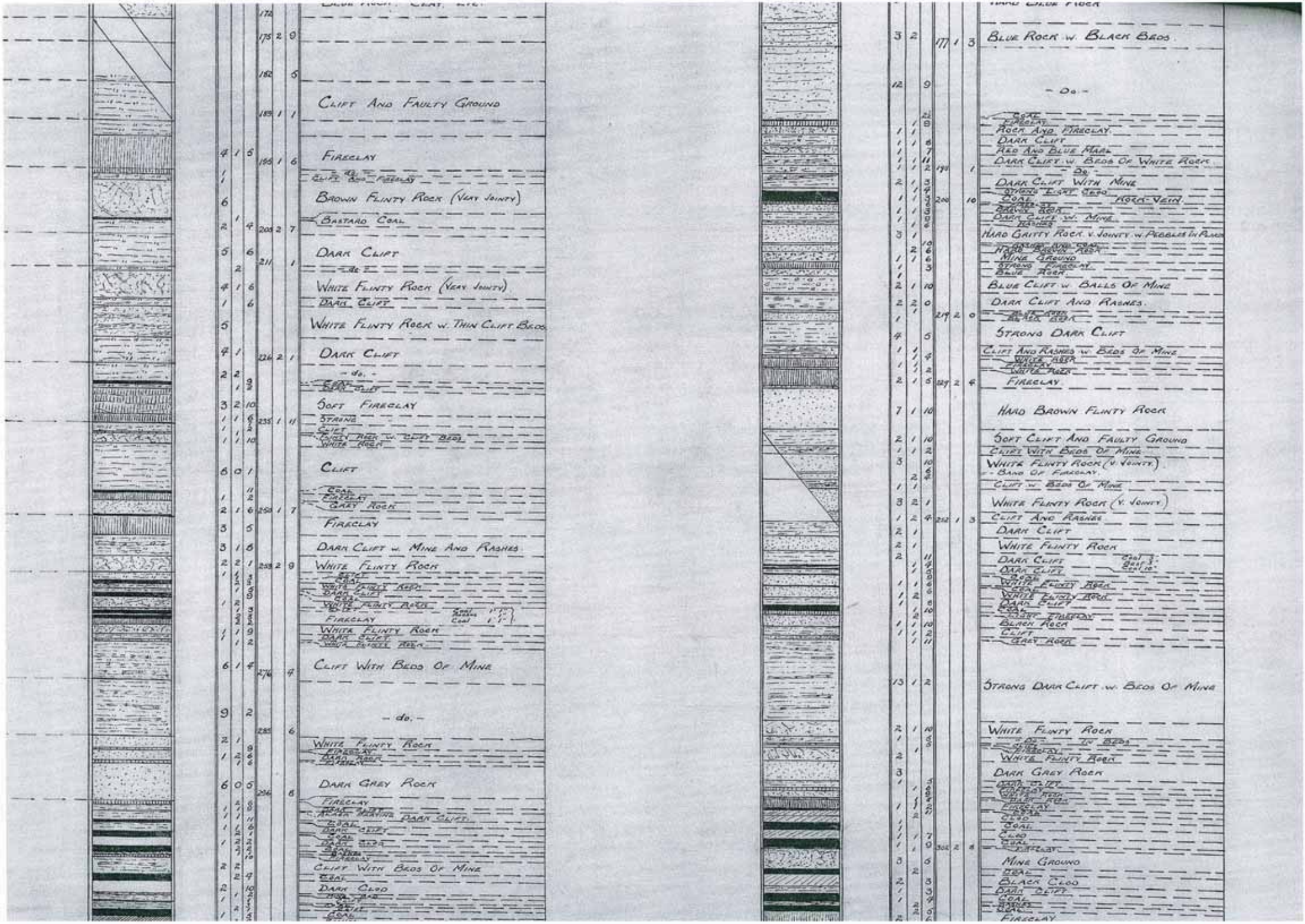
Beds Yds	Ft	In	Depth Yds	Ft	In	
12		5				Surface Ground
2						Hard Blue Pennant Rock
3						Course Conglomerate
4	2	4				Hard Blue Jointy Rock.
			21	2	9	
4	2					-do-
2		8				Rock Beds
8	2	7				Hard Blue Jointy Rock
2		3				Rock Beds.
1	1	6	40	1	9	Thin Beds Of Black Rock.
1	2	6				-do-
7						Rock (Rotten in Places)
6	6					Hard Blue Rock in Beds.
2	1	6	58	1	9	Cliff
4	2	6				Hard Blue Rock in Beds.
7	1	0				Thin Beds Of Rock
1						Bastard Cliff
4			75		9	Hard Blue Jointy Rock
7						-do-
	1					Bed Of Cliff 3 to 5'6" Thick
3	2	6				Hard Blue Jointy Rock.
3	2	6				-do- (in Beds).
2		9				Thin Beds Of Rock
4	2	9				Rock And Conglomerate
1	1					Blue Rock
						Coal

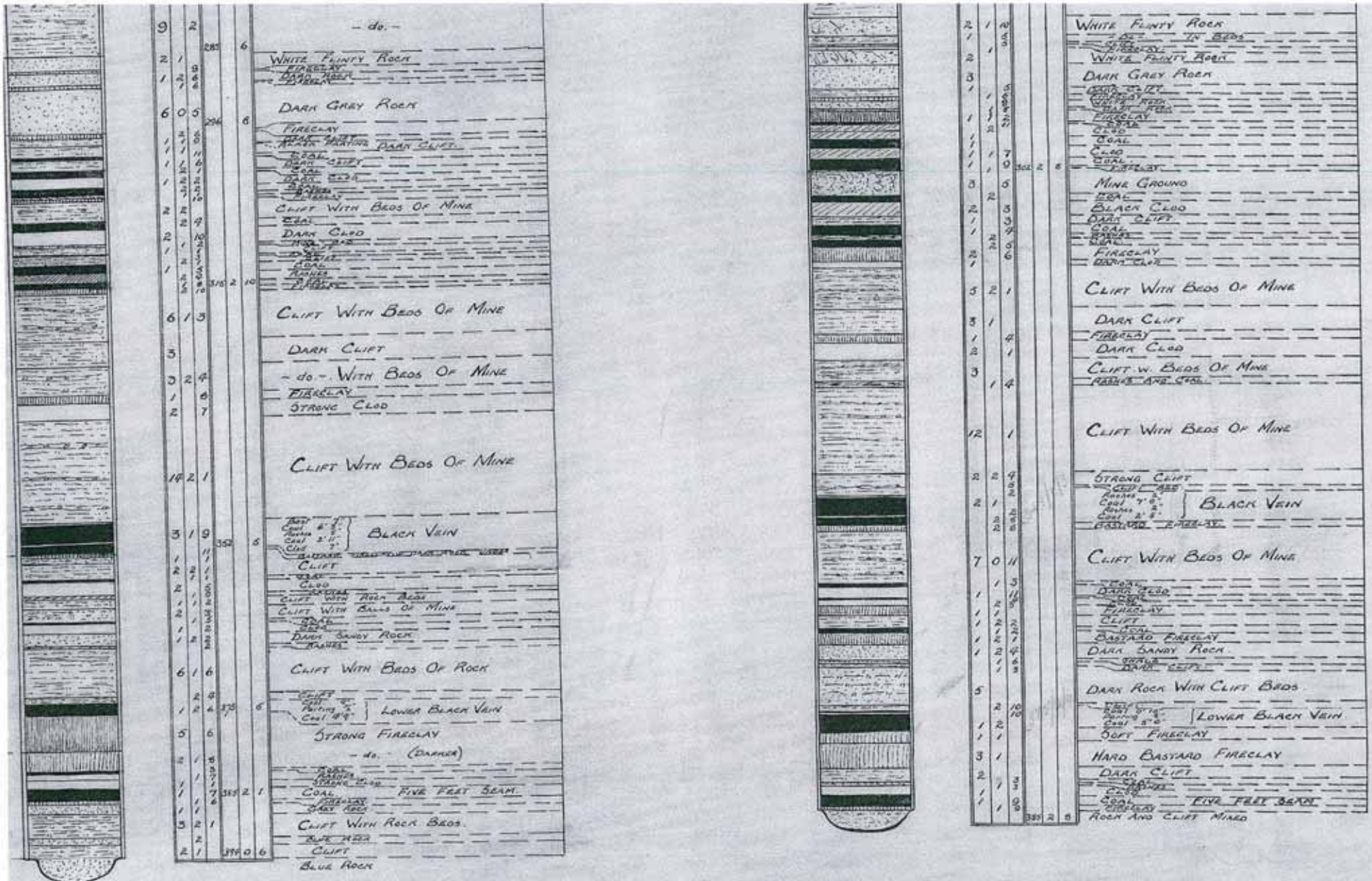
EAST PIT



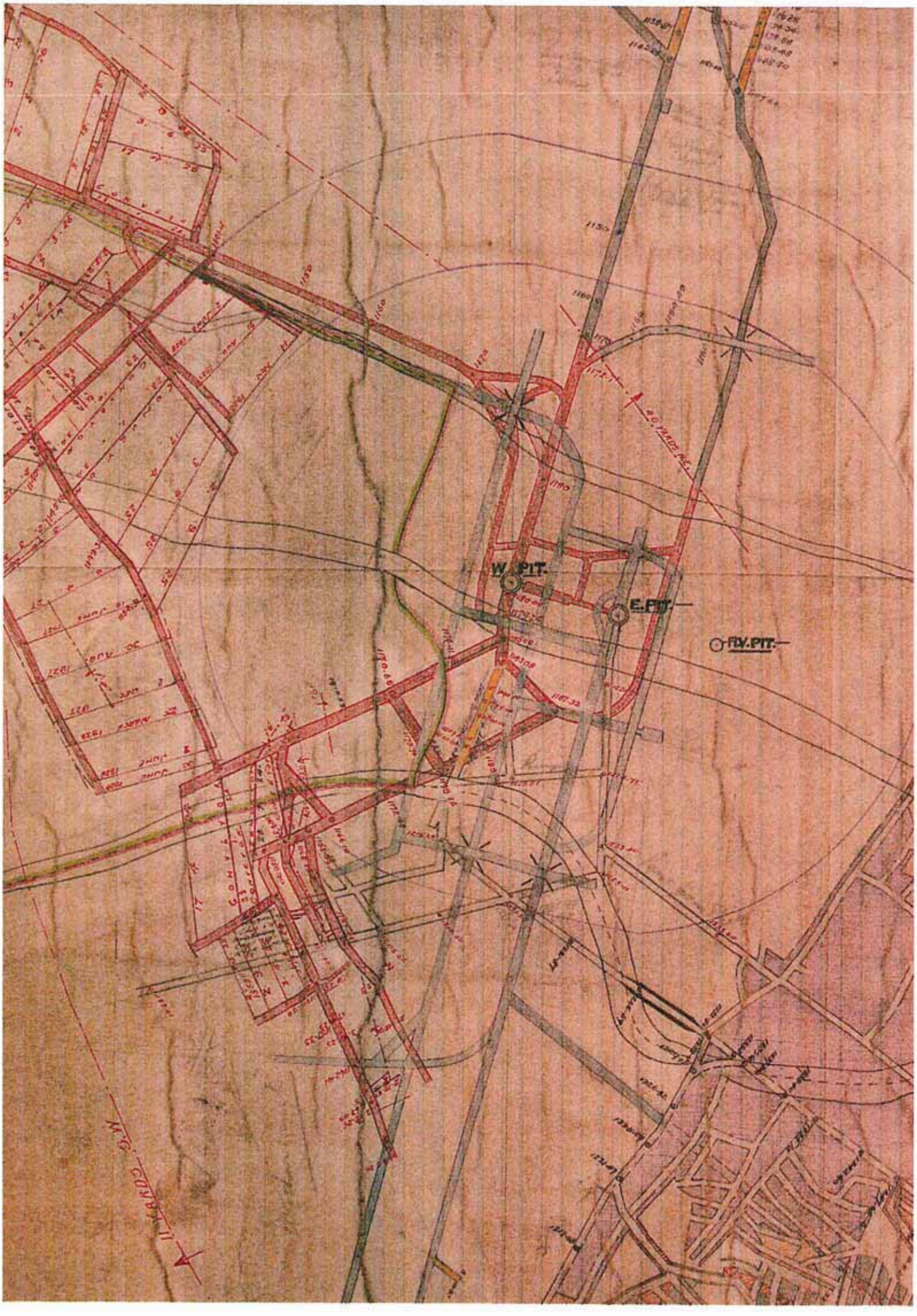
Beds Yds	Ft	In	Depth Yds	Ft	In	
11						Surface Ground
2			11			Hard Blue Pennant Rock
5						Course Conglomerate
4	1	7	20	1	7	Hard Blue Jointy Rock
4						-do-
9	1	5				Hard Blue Pennant Rock (v. Jointy)
1		3	35	0	5	Rock Beds
5	2					Hard Blue Pennant Rock
2	1					Thin Rock Beds
4						Rock And Conglomerate Mixed
1						Bastard Fireclay
2	1	10	60	2	3	Rock
4	1	5				Rock
2	2	6				Cliff
1			59	0	2	Rock
8		2				Rock With Spar Joints.
	1	6				Thin Beds Rock
1	2					Cliff
1	2					Bastard Rock
1	2					Rock With Spar Joints.
1	1	2	72		11	Thin Beds Of Black Rock.
3						Rock With Course Conglomerate
	1					Hard Fine Conglomerate
	2					Coal
5	1					Rock
		9				Coal
2	2	1	84		6	Hard Rock
7		6				Very Hard Rock And Conglomerate
1	1	10	94	2	10	Bastard Rock With Coal Joints.
	2	3				Soft Rock Band & Conglomerate &
	1					Coal

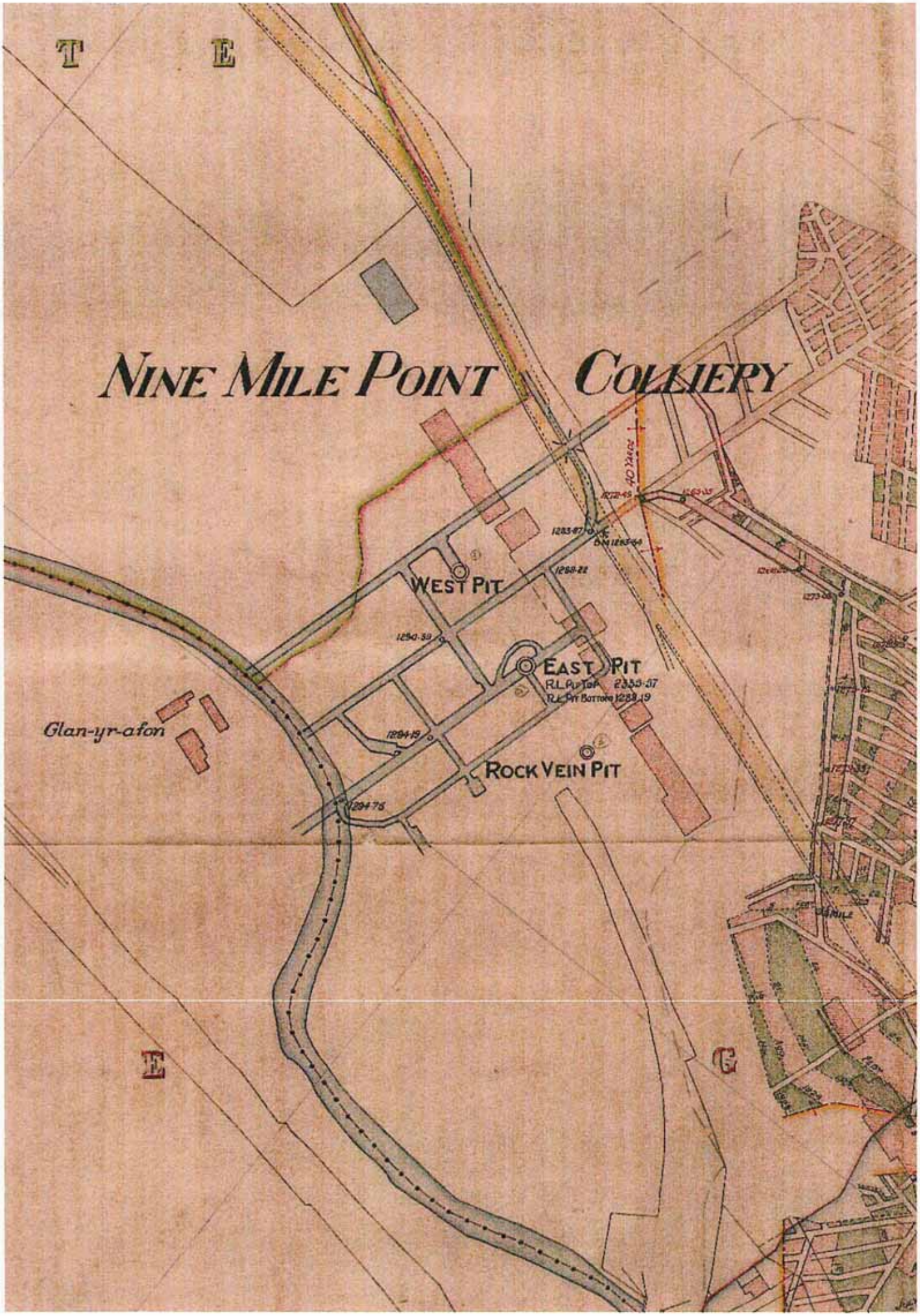

- do -
Red Of Cliff 3 to 3'6" Thick
Hard Blue Jointy Rock
- do - (In Beds)
Thin Beds Of Rock
Rock And Conglomerate
Blue Rock
Light
Very Jointy White Rock & Sandy Conglomerate
Bastard Fireclay
Red And Blue Marl
Red And Green Marl
- do - (Stranger)
Red Marl
Green Rock
Red And Green Marl
Jointy White Rock w. Pebbles
Sandy Conglomerate And Pebbles
Green Bastard Cliff
Dark Cliff w. Beds Of Mine
Fireclay
Red And Green Marl
Bastard Rock (Irregular)
Fireclay
Red And Blue Marl
Fireclay
Green Rock
Jointy Grey Rock
Sandy Conglomerate And Pebbles
Dark Cliff And Rock Mixed
Hard Blue Rock
Pebbles Coal Parting
Cliff With Beds Of Mine
White Rock
Blue Rock Clay Etc.
Cliff And Faulty Ground
Fireclay
Brown Flinty Rock (Very Jointy)
Bastard Coal
Dark Cliff
White Flinty Rock (Very Jointy)
Dark Cliff
White Flinty Rock w. Thin Cliff Bds
Rock With Course Conglomerate
Hard Fine Conglomerate
Rock
Hard Rock
Very Hard Rock And Conglomerate
Bastard Rock With Coal Joints
Cliff Rock Sand & Conglomerate
Black Clay
Strong Fireclay
White Rock (V. Jointy)
Fireclay And Cliff Mixed
Rock Band
Red And Blue Marl
Hard Band Of Bastard Green Rock
Red And Green Marl w. Hard Bands Of Do.
Red Marl
Hard White Rock w. Pebbles V. Jointy.
Bastard Cliff w. Beds Of Mine
Strong Dark Fireclay
Green Cliff w. Irregular Bands Of Rock
Brown Cliff w. Thin Beds Of Mine
Fireclay
Red And Blue Marl
Grey Rock (V. Jointy)
Hard Grey Rock And Flinty Conglomerate
Jointy Grey Rock And Bastard Fireclay
Bastard Grey Rock (V. Jointy.)
White Rock With Pebbles
Flinty Conglomerate And Pebbles
Flinty Pebbles.
Cliff With Balls Of Mine
- Do. -
Hard Blue Rock
Cliff
Hard Blue Rock
Blue Rock w. Black Beds
- Do. -
Fireclay
Rock And Fireclay
Dark Cliff
Red And Blue Marl
Dark Cliff w. Beds Of White Rock
- Do. -
Dark Cliff With Mine
Strong Flint Clay
Coal
Rock Vein
Dark Cliff w. Mine
Hard Gritty Rock V. Jointy w. Pebbles In Place
Mine Ground
Strong Fireclay
Blue Rock
Blue Cliff w. Balls Of Mine
Dark Cliff And Ragnes.

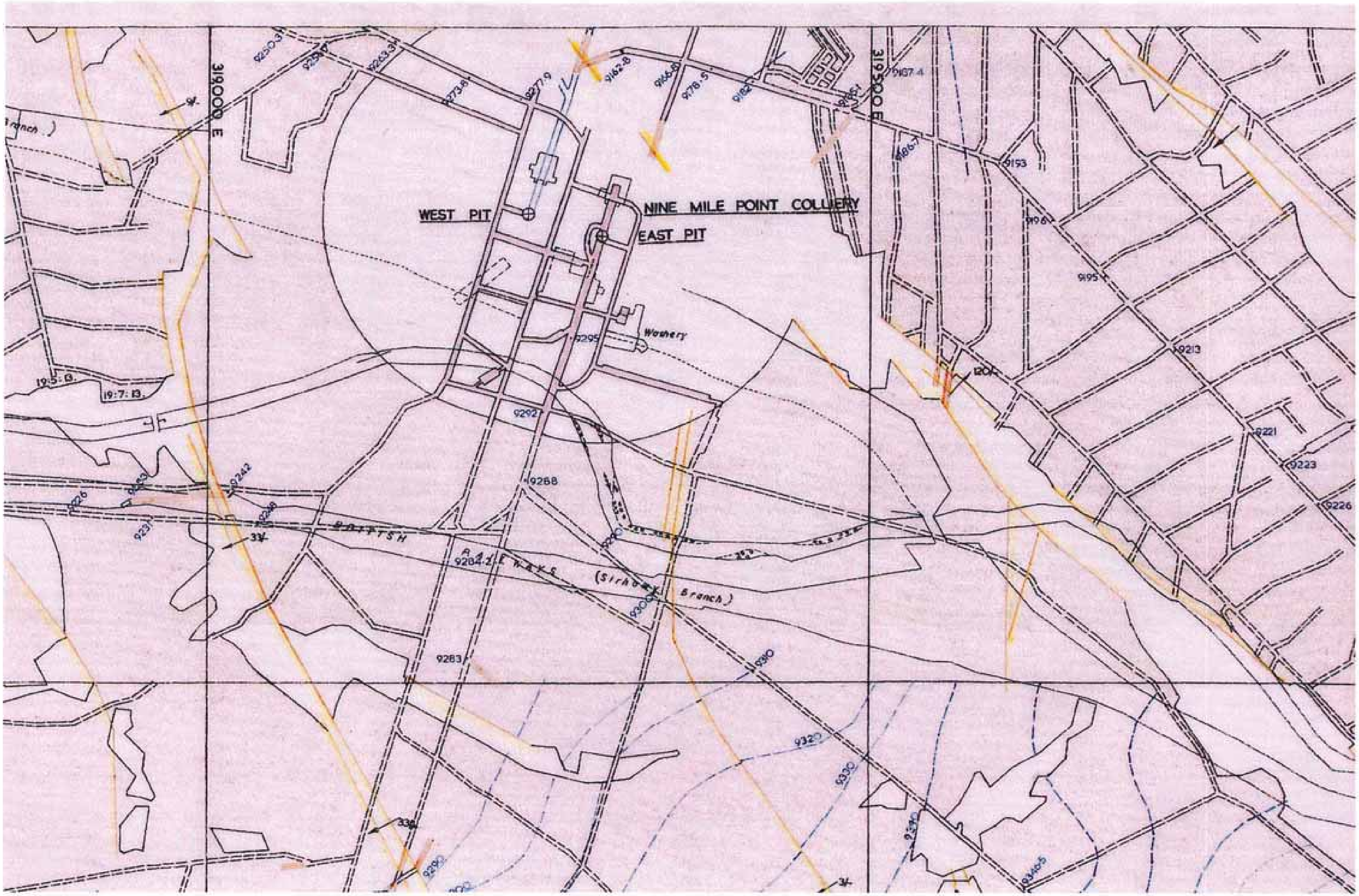

Clift And Faulty Ground
Fireclay
Brown Flinty Rock (Very Jointy)
Bastard Coal
Dark Clift
White Flinty Rock (Very Jointy)
White Flinty Rock w. Thin Cliff Beds
Dark Clift
- do. -
Soft Fireclay
Clift
Fireclay
Dark Clift w. Mine And Rashes
White Flinty Rock
Clift With Beds Of Mine
- do. -
White Flinty Rock
Dark Grey Rock
Clift With Beds Of Mine
Dark Clod
Blue Rock w. Black Beds
- do. -
Rock And Fireclay
Dark Clift
Red And Blue Marl
Dark Clift w. Beds Of White Rock
- do. -
Dark Clift With Mine
Coal
Hard Gritty Rock v. Jointy w. Pebbles In Place
Mine Ground
Blue Rock
Blue Clift w. Balls Of Mine
Dark Clift And Rashes.
Strong Dark Clift
Clift And Rashes w. Beds Of Mine
Fireclay
Hard Brown Flinty Rock
Soft Clift And Faulty Ground
Clift With Beds Of Mine
White Flinty Rock (v. Jointy)
- Band Of Fireclay.
Clift w. Beds Of Mine
White Flinty Rock (v. Jointy)
Clift And Rashes
Dark Clift
White Flinty Rock
Dark Clift
Black Rock
Clift
Grey Rock
Strong Dark Clift w. Beds Of Mine
White Flinty Rock
White Flinty Rock
Dark Grey Rock
Coal
Mine Ground
Black Clod
Dark Clift
Fireclay

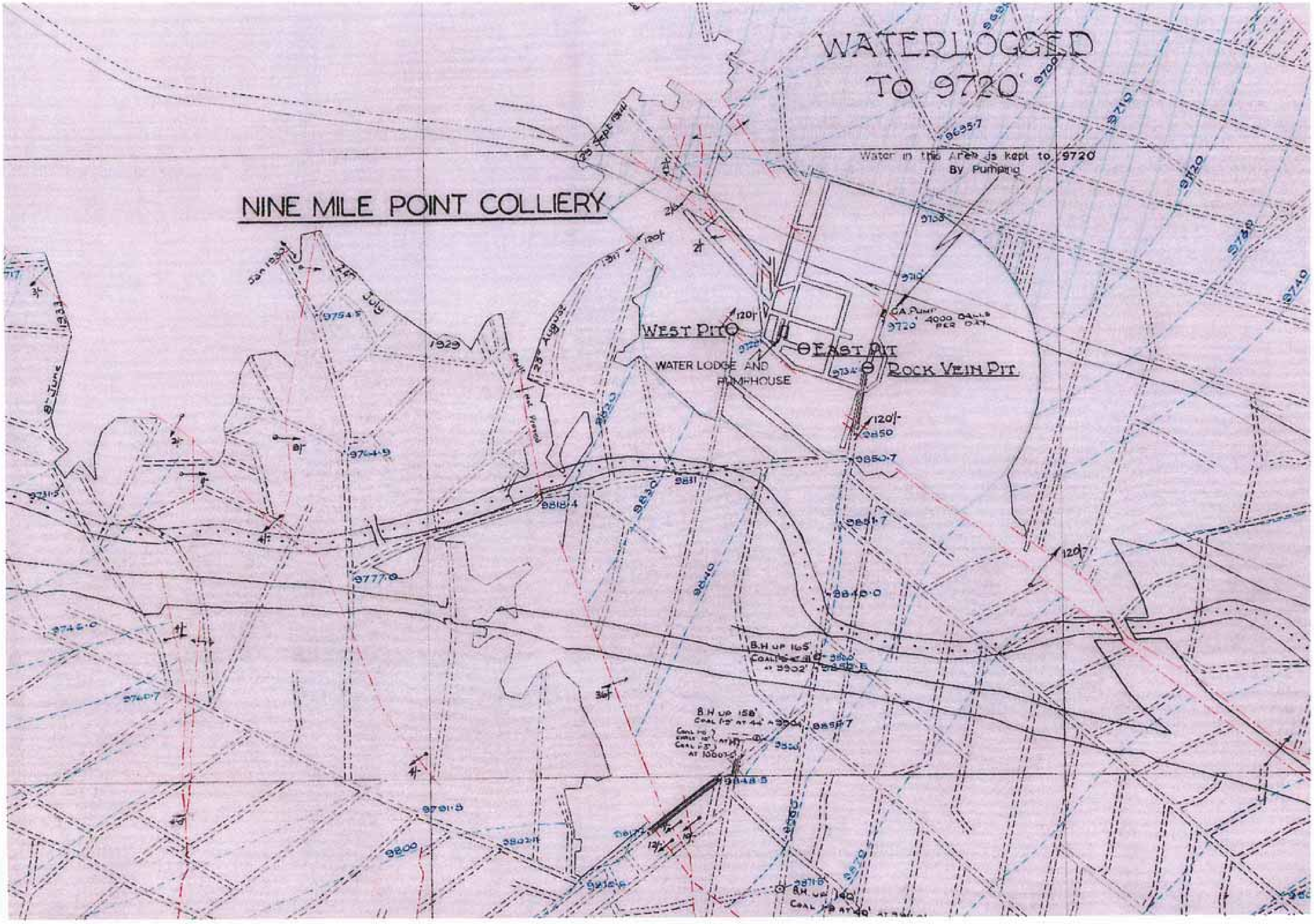

– do. –
White Flinty Rock
Dark Grey Rock
Firclay
Dark Cliff
Cliff With Beds Of Mine
Coal
Dark Clod
Cliff With Beds Of Mine
Dark Cliff
– do. – With Beds Of Mine
Fireclay
Strong Clod
Cliff With Beds Of Mine
Black Vein
Cliff
Clod
Cliff With Rock Beds
Cliff With Balls Of Mine
Dark Sandy Rock
Cliff With Beds Of Rock
Lower Black Vein
Strong Fireclay
– do. (Darker)
Coal
Five Feet Seam.
Cliff With Rock Beds.
Blue Rock
Cliff
Blue Rock
White Flinty Rock
In Beds
White Flinty Rock
Dark Grey Rock
Fireclay
Coal
Clod
Coal
Fireclay
Mine Ground
Coal
Black Clod
Dark Cliff
Coal
Fireclay
Dark Clod
Cliff With Beds Of Mine
Dark Cliff
Fireclay
Dark Clod
Cliff w. Beds Of Mine
Cliff With Beds Of Mine
Strong Cliff
Black Vein
Fireclay
Cliff With Beds Of Mine
Coal
Dark Clod
Coal
Fireclay
Cliff
Coal
Bastard Fireclay
Dark Sandy Rock.
Dark Rock With Cliff Beds
Lower Black Vein
Soft Fireclay
Hard Bastard Fireclay
Dark Cliff
Coal
Five Feet Seam
Rock And Cliff Mixed

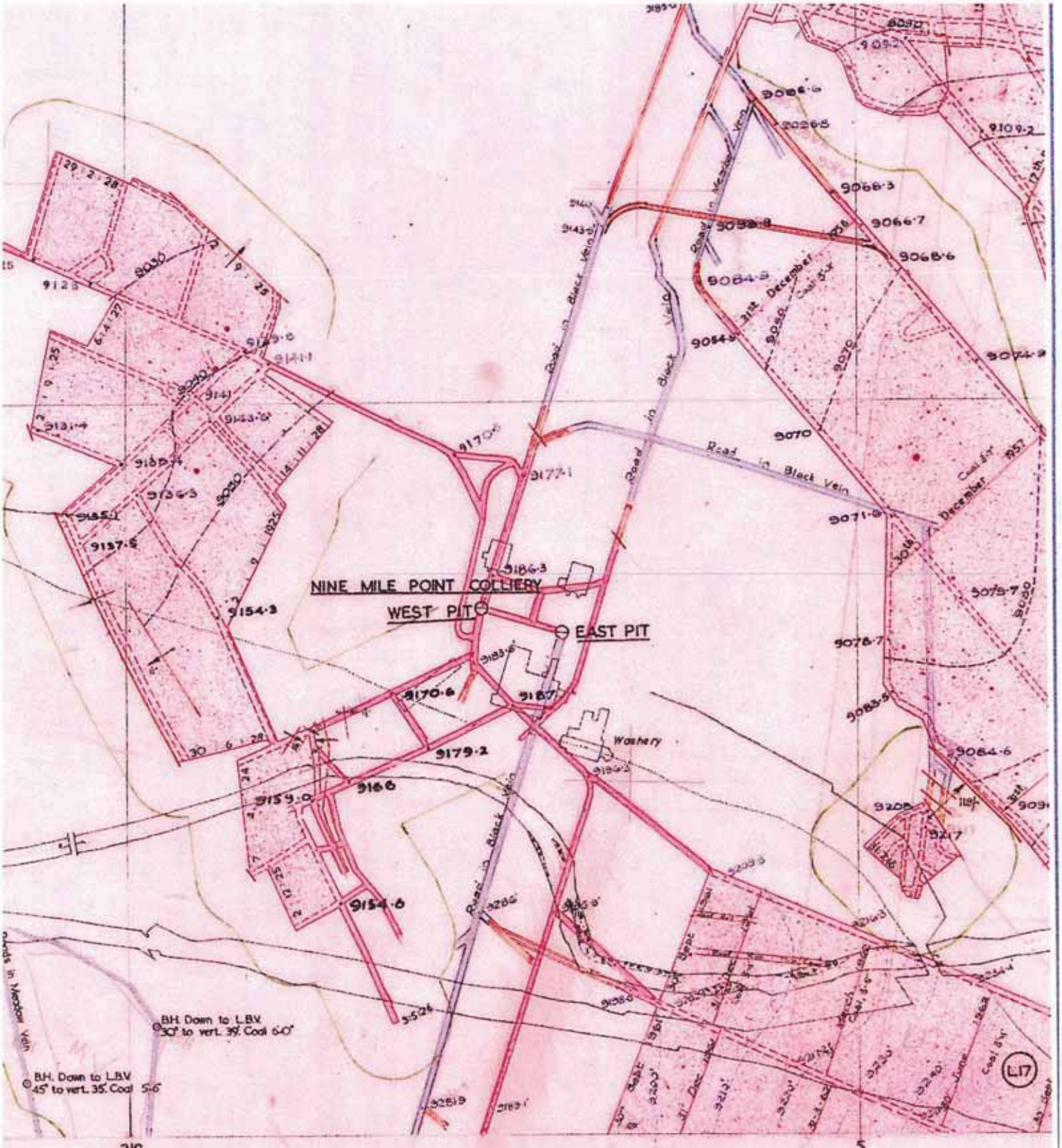
APPENDIX D – COAL MINING MINE ABANDOMENT PLANS


W. PIT.
E. PIT.
FLY. PIT.


T
E
NINE MILE POINT COLLIERY
40 YARDS
WEST PIT
EAST PIT
R.L. Pit Top 2333·57
R.L. Pit Bottom 1283·19
ROCK VEIN PIT
Glan-yr-afon
E
G


NINE MILE POINT COLLIERY
WEST PIT
EAST PIT
Washery
319000 E
319500 E
BRITISH RAILWAYS
(Sirhowy Branch)
9277.9
9162.8
9273.8
9263.3
9250.3
9295
9292
9288
9283
9242
9300
9320
9330
9193
9196
9195
9213
9221
9223
9226
9167.4
19:5:13.
19:7:13.

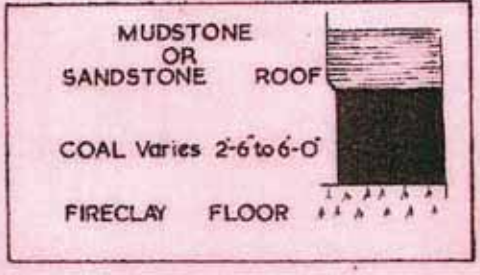

NINE MILE POINT COLLIERY
WATERLOGGED TO 9720'
Water in this Area is kept to 9720 By Pumping
WEST PIT
EAST PIT
ROCK VEIN PIT
WATER LODGE AND PUMPHOUSE
9700
9710
9720
9730
9740
9850
9850.7
9851.7
9840
9840.0
9830
9831
9818.4
9777.0
9764.9
9754.5
9746.0
9740.7
9791.8
9800
1929
July
August
June
1933



-SCALE : 1/2500-

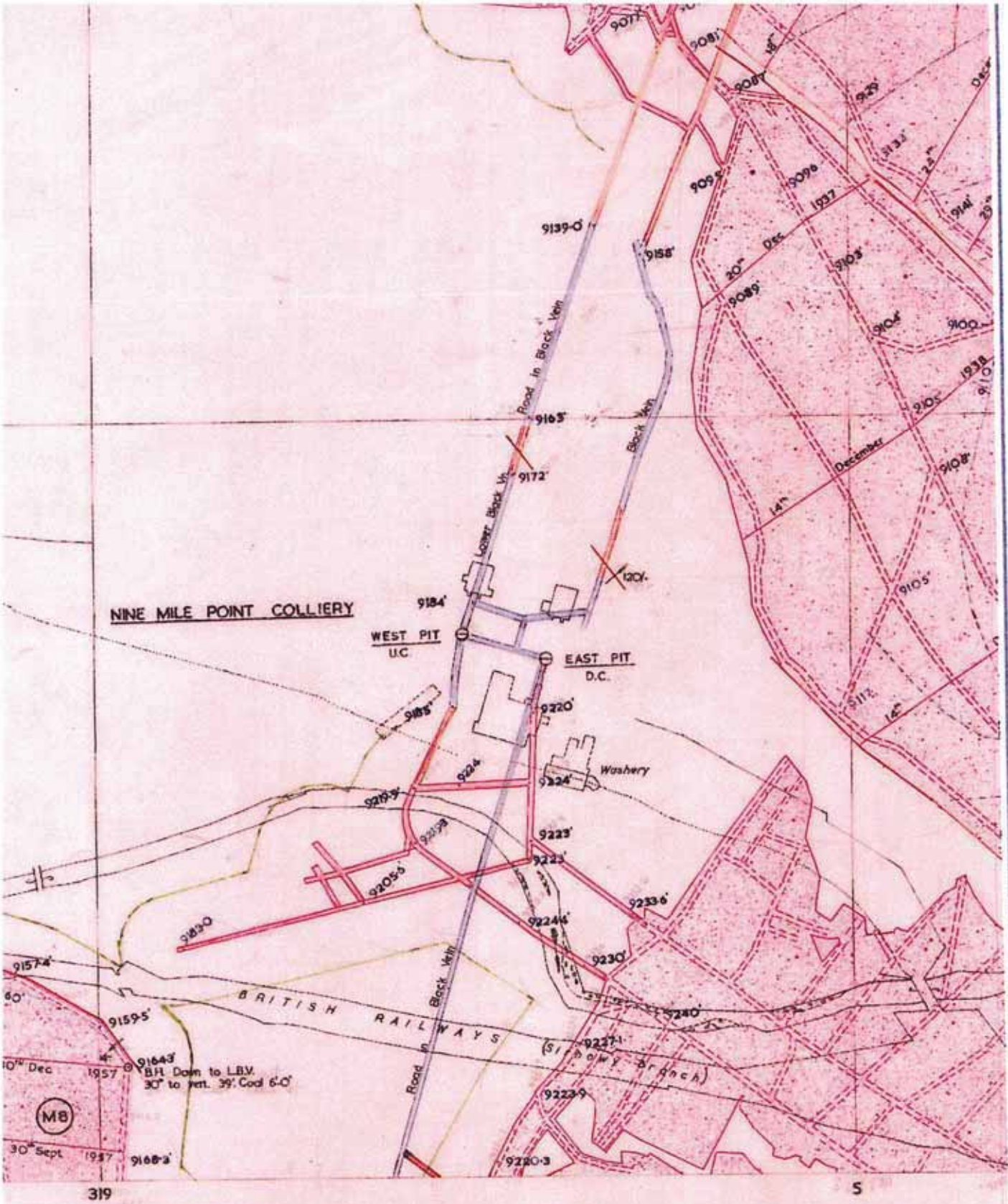
DATUM FOR LEVELS—
10,000 FEET BELOW ORDNANCE DATUM

SECTION OF SEAM



LO

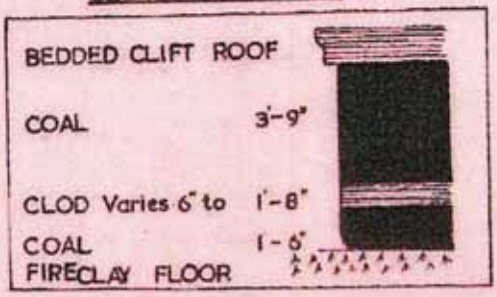
5



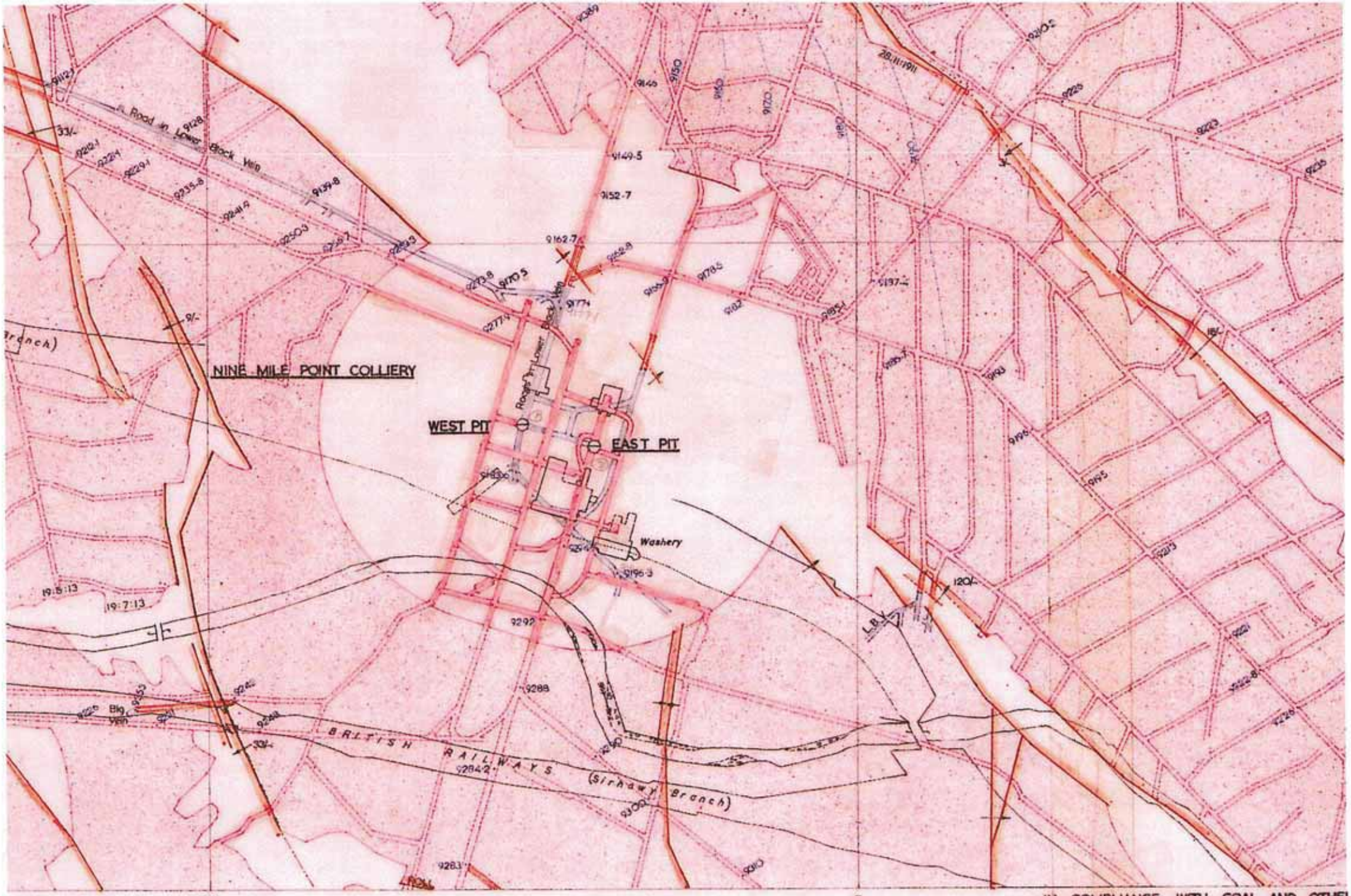
SCALE :- 1/2500

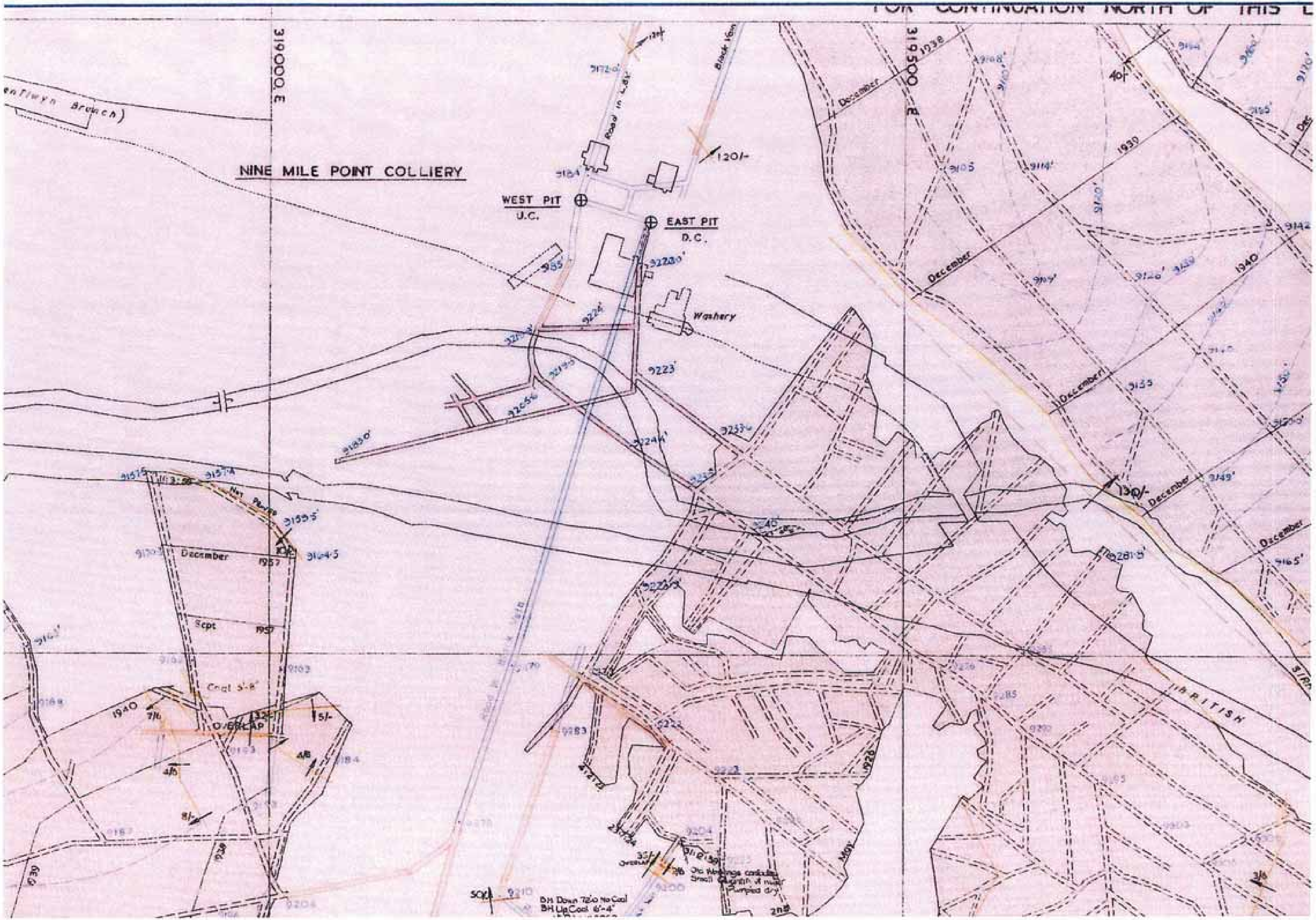
DATUM FOR LEVELS—
10000 FEET BELOW ORDNANCE DATUM

SECTION OF SEAM



A


NINE MILE POINT COLLIERY
WEST PIT
EAST PIT
Washery
BRITISH RAILWAYS
(Sirhowy Branch)
Road to Lower Black Vein
319
5
IN COMPLIANCE WITH COAL AND OTHE
(SURVEYORS & PLANS) REGULATIONS, 19
WITHIN 120 FEET VERTICALLY ARE


FOR CONTINUATION NORTH OF THIS
NINE MILE POINT COLLIERY
WEST PIT
U.C.
EAST PIT
D.C.
Washery
319000 E
319500 E
BRITISH
December
Sept
1957
1940
1938
1930
OVERLAP
Coal 5'-8"
Old Workings contain small quantity of water Pumped dry
BH Down 72'0 No Coal
BH Up Coal 6'-4"

Enzygo specialise in a wide range of technical services:

Property and Sites
Waste Planning
Waste Technologies and Renewables
Waste Technologies
Landscape Architecture
Environmental Co-ordination
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Environmental Planning
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BRISTOL OFFICE
The Granary
Woodend Lane
Cromhall
Bristol GL12 8AA
Tel: 01454 269237
Fax: 01454 269760

kevin.parr@enzygo.com

SHEFFIELD OFFICE
STEP Business Centre
Wortley Road
Deepcar
Sheffield S36 2UH
Tel: 0114 2903677
Fax: 0114 2903688

matt.travis@enzygo.com

MONMOUTH OFFICE, WALES
Singleton Court Business Park
Wonastow Road
Monmouth
Monmouthshire NP25 5JA
Tel: 01600 714611
Fax: 01600 716744

chris.formaggia@enzygo.com

Please visit our website for more information.

enzygo.com

EmapSite

Masdar House, ,
Eversley, RG27 0RP

Groundsure Reference:	EMS-299380_404633
Your Reference:	EMS_299380_404633
Report Date	20 Apr 2015
Report Delivery Method:	Email - pdf

Groundsure Enviroinsight

Address: ,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviroinsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Enviroinsight

Groundsure Enviroinsight

Address:	,
Date:	20 Apr 2015
Reference:	EMS-299380_404633
Client:	EmapSite

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	23-May-2010
Grid Reference:	319235,191305
Site Size:	1.15ha

Contents Page

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
1.1.1 Records of historic IPC Authorisations	0	0	0	0
1.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0
1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0
1.1.5 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
1.1.6 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
1.1.7 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
1.1.9 Records of Licensed Discharge Consents	0	0	1	1
1.1.10 Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0
1.2 Records of COMAH and NIHHS sites	0	0	0	0
1.3 Environment Agency Recorded Pollution Incidents				
1.3.1 National Incidents Recording System, List 2	0	0	2	0
1.3.2 National Incidents Recording System, List 1	0	0	0	0
1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 2: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.1 Landfill Sites						
2.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
2.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	1	0
2.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
2.1.4 Groundsure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings						

Section 2: Landfill and Other Waste Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
2.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	0	0

Section 3: Current Land Use

	On-site	0-50m	51-250	251-500
3.1 Current Industrial Sites Data	1	2	5	Not searched
3.2 Records of Petrol and Fuel Sites	0	0	0	0
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0

Section 4: Geology

4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 5: Hydrogeology and Hydrology

	0-500m
5.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
5.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
5.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
5.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
5.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
5.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
5.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
5.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	2	0	0	0	Not searched	Not searched

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
5.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	Yes
5.10 Detailed River Network entries within 500m of the site	0	0	6	16	Not searched	Not searched
5.11 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 6: Flooding

6.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Limited potential
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low

Section 7: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
7.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.5 Records of Ramsar sites	0	0	0	0	0	0
7.6 Records of Ancient Woodlands	1	1	5	7	64	122
7.7 Records of Local Nature Reserves (LNR)	0	0	0	1	0	1
7.8 Records of World Heritage Sites	0	0	0	0	0	0
7.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
7.11 Records of National Parks	0	0	0	0	0	0
7.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
7.14 Records of Green Belt Data	0	0	0	0	0	0

Section 8: Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Moderate
8.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Very Low
8.1.2 What is the maximum Landslides hazard rating identified on the study site?	Low
8.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
8.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Moderate
8.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
8.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low

Section 9: Mining

9.1 Are there any coal mining areas within 75m of the study site?	Yes
9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Low
9.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

5. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence.

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

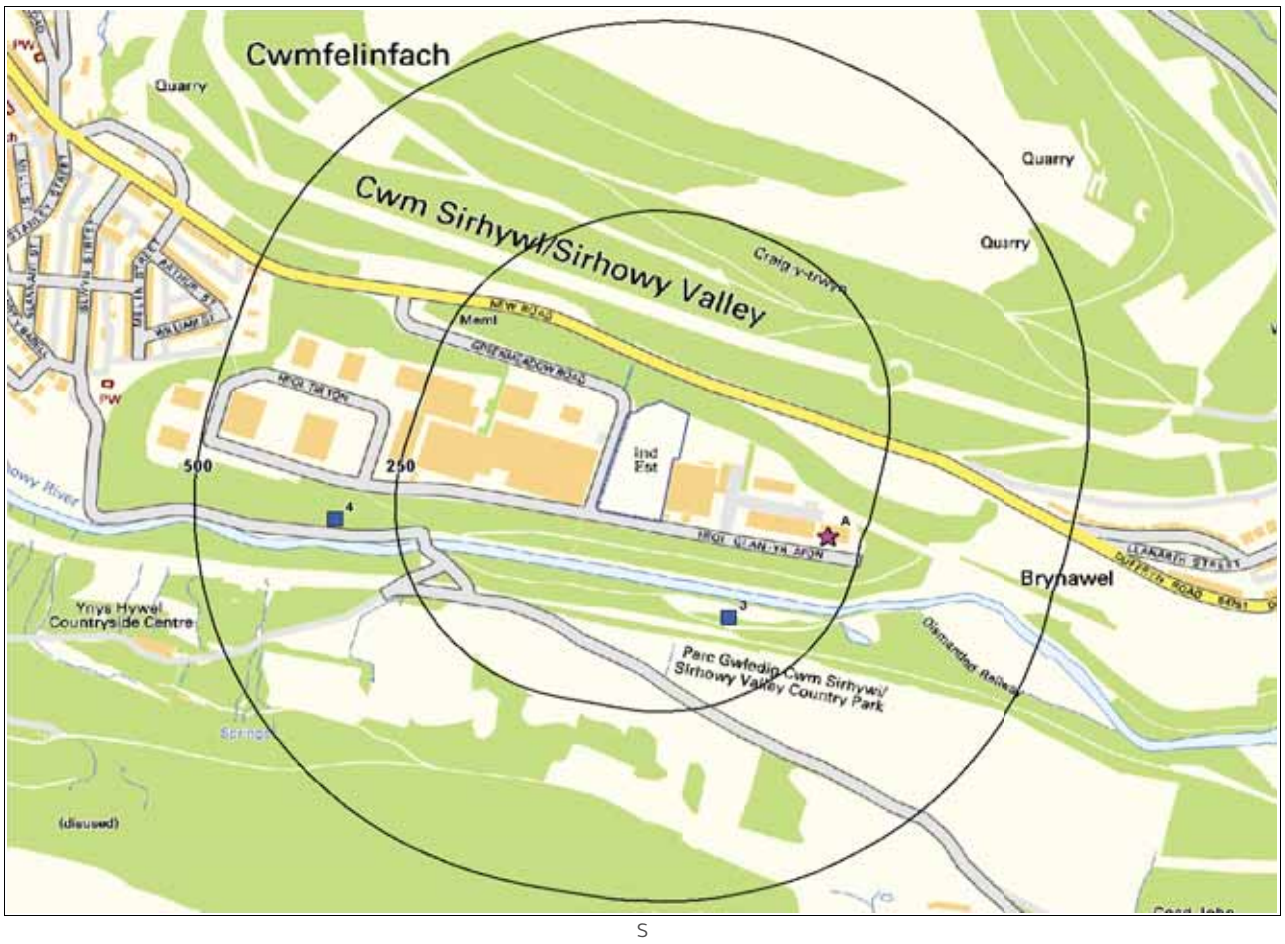
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Environmental Permits, Incidents and Registers Map



Environmental Permits, Incidents and Registers Legend

Mapping sourced from Ordnance Survey

- Site Outline
- 250 / 500 Search Buffers (m)
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

1. Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

1.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

1.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

1.1.5 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.6 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.7 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

0

Database searched and no data found.

1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

1.1.9 Records of Licensed Discharge Consents within 500m of the study site:

2

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
3	152.0	SE	319340 191100	Address: Wvts-nine Mile Point Colliery, Wvts-nine Mile Point Colliery Effluent Type: Unspecified Permit Number: AD0004806 Permit Version: 1	Receiving Water: Sirhowy River Status: Consent Expired - Time Limit Issue date: 8/3/1967 Effective Date: 8/3/1967 Revocation Date: 4/3/1994
4	326.0	W	318850 191230	Address: Wvts-cwmfelinfach Sso, Wvts-cwmfelinfach Sso Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: AD0009508 Permit Version: 1	Receiving Water: Sirhowy River Status: New Consent, By Application (wra 91, Section 88) Issue date: 23/4/1968 Effective Date: 23/7/1968 Revocation Date: -

---

1.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

1.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

2

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1A	207.0	E	319463 191208	Incident Date: 03/10/2005 Incident Identification: 361634 Pollutant: Specific Waste Materials Pollutant Description: Inorganic Chemical Wastes	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
2A	208.0	E	319464 191207	Incident Date: 06/11/2002 Incident Identification: 120201 Pollutant: Specific Waste Materials Pollutant Description: Inorganic Chemical Wastes	Water Impact: Category 2 (Significant) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

1.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

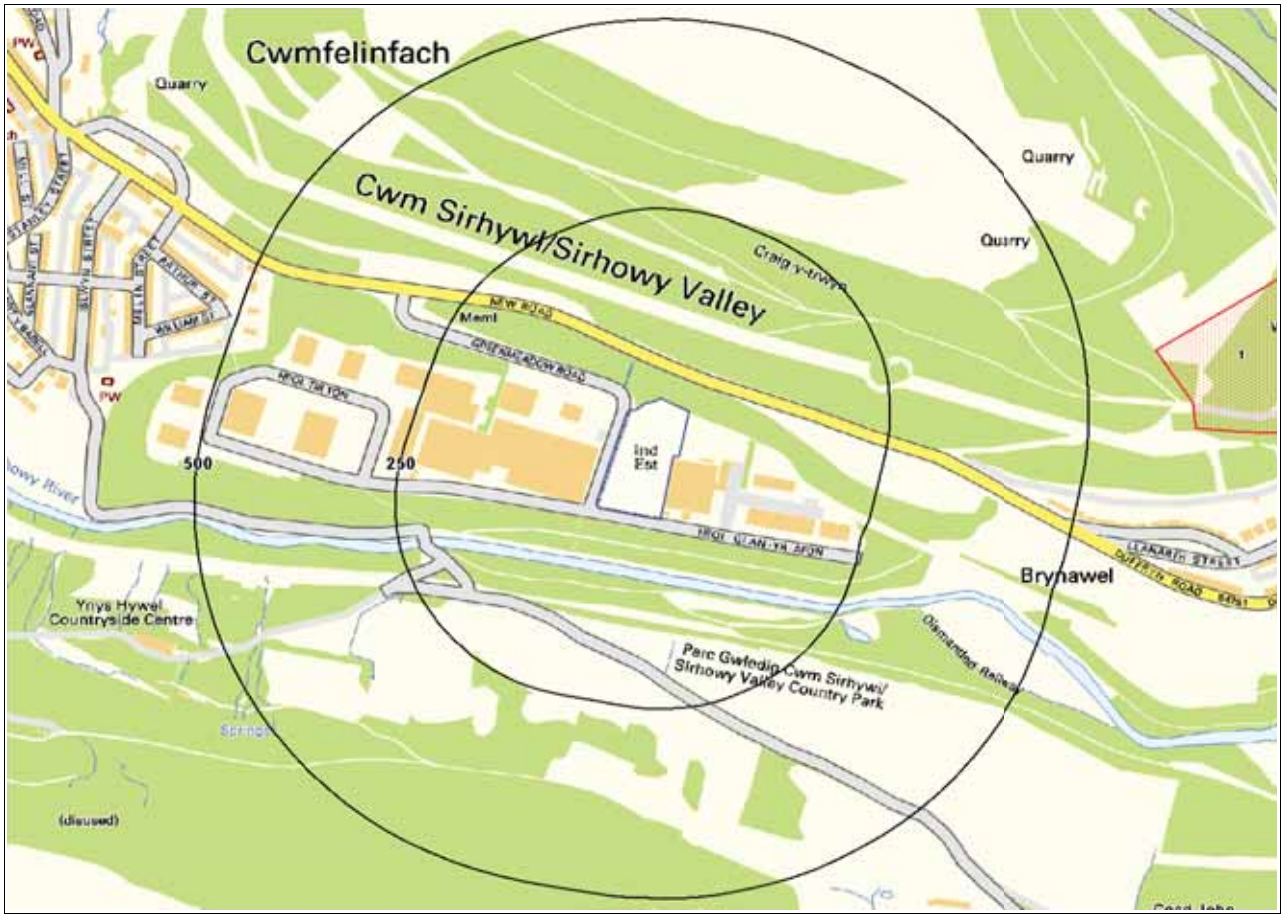
Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

2. Landfill and Other Waste Sites Map



Landfill and Other Waste Sites Legend

Mapping sourced from Ordnance Survey

- Site Outline
- Search Buffers (m) 250 / 500
- E.A. Active Landfill
- E.A. Historic Landfill
- Local Authority Landfill
- Historic and Planned Waste Sites
- E.A. Licensed Waste Site
- BGS / DoE Survey Landfill

2. Landfill and Other Waste Sites

2.1 Landfill Sites

2.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

2.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

1

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
1	588.0	E	320000 191400	Site Address: Graig-Yr-Trwyn, Duffryn Road, Brynawel Waste Licence: Yes Site Reference: - Waste Type: Inert, Industrial, Commercial, Household, Special Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

2.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.1.4 Records of Local Authority landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.2 Other Waste Sites

2.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

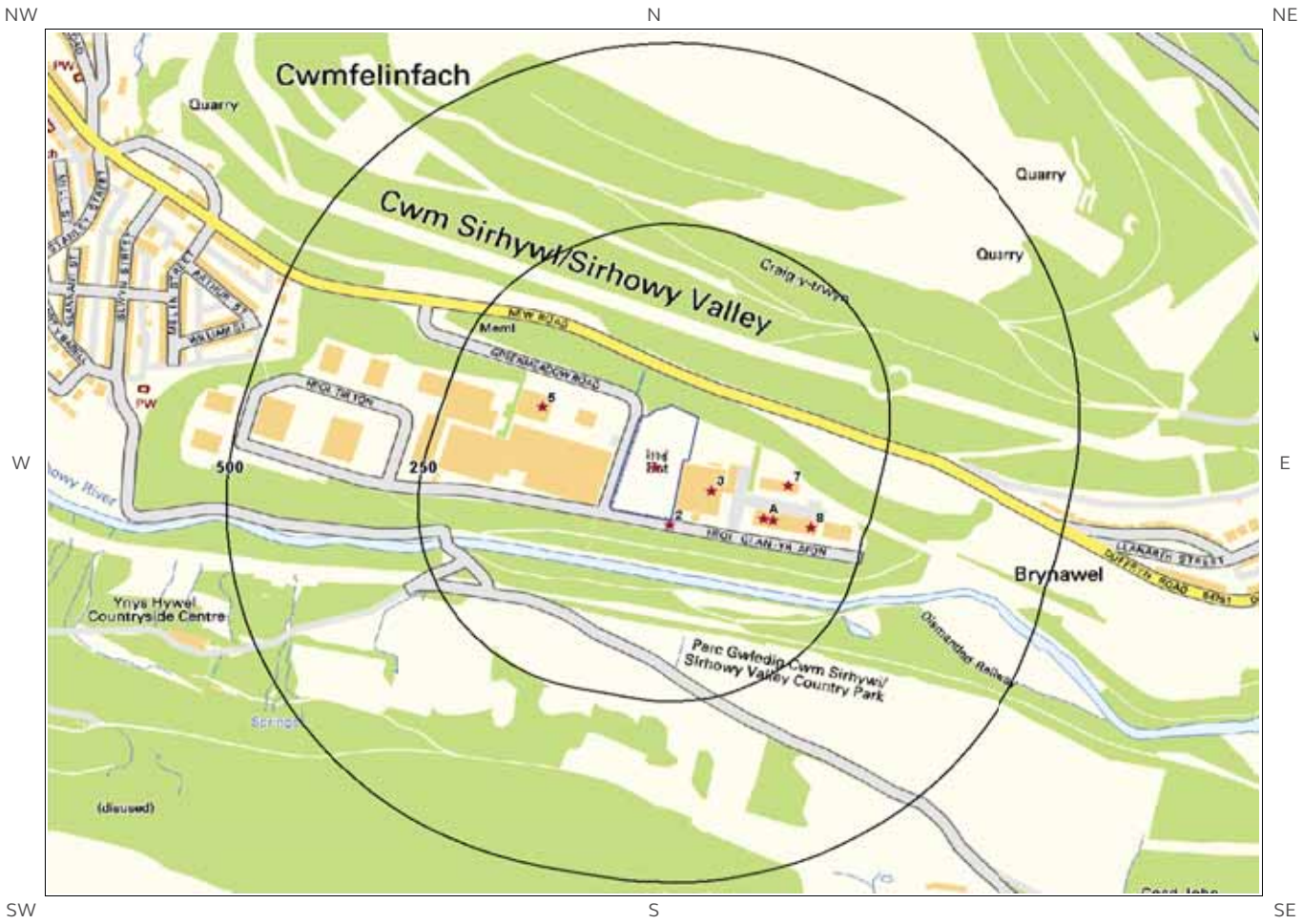
2.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

0

Database searched and no data found.

---

3. Current Land Use Map



Current Land Use Legend

Mapping sourced from Ordnance Survey®

Site Outline

250
500
Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Underground High Pressure Oil & Fuel Pipelines

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 8

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	0.0	On Site	Nine Mile Point Industrial Estate		NP11	Business Parks and Industrial Estates	Industrial Features
2	6.0	S	Electricity Sub Station		NP11	Electrical Features	Infrastructure and Facilities
3	44.0	E	Penny & Giles Controls Ltd	319308 191267	Unit 35-36, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Electrical Components	Industrial Products
4A	118.0	E	Rochester Midland Corporation	319376 191229	Unit 24, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Air and Water Filtration	Industrial Products
5	125.0	W	Mollertech UK Ltd	319087 191383	Unit 1, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Rubber, Silicones and Plastics	Industrial Products
6A	130.0	E	Biometrics Ltd	319388 191227	Unit 25-26, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Medical Equipment, Supplies and Pharmaceuticals	Industrial Products
7	134.0	E	K C J Engineering Ltd	319408 191274	Unit 33, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Tools Including Machine Shops	Industrial Products
8	181.0	E	Isca UK Ltd	319438 191216	Unit 29, Nine Mile Point Industrial Estate, Ynysddu, Newport, NP11 7HZ	Colours, Chemicals and Water Softeners and Supplies	Industrial Products

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: 0

Database searched and no data found.

---

4. Geology

4.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
GFDUD	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

4.3 Bedrock and Solid Geology

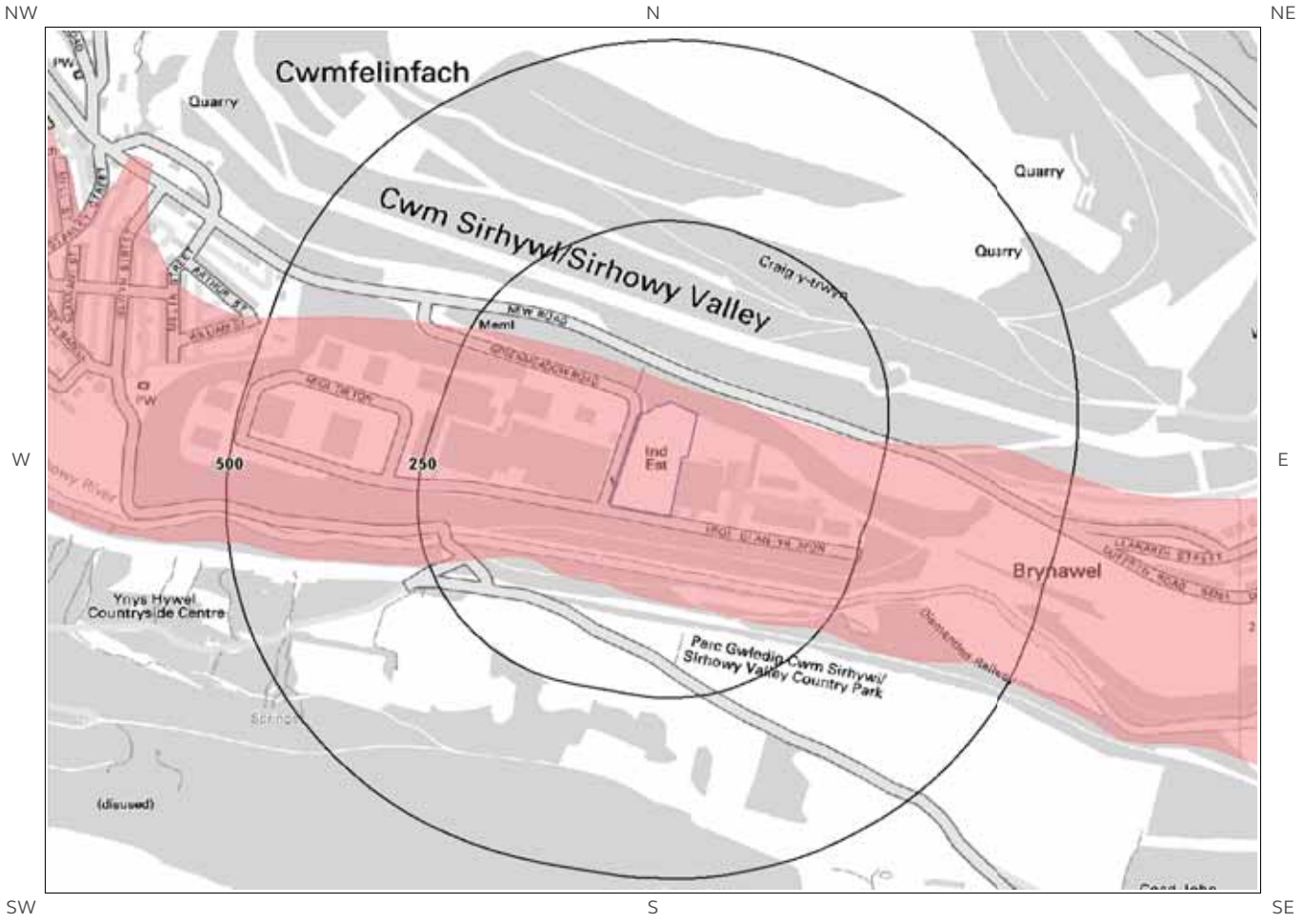
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
BD-SDST	BRITHDIR MEMBER	SANDSTONE
BD-SDST	BRITHDIR MEMBER	SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

5. Hydrogeology and Hydrology

5a. Aquifer Within Superficial Geology



Aquifer Within Superficial Geology

Mapping sourced from Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

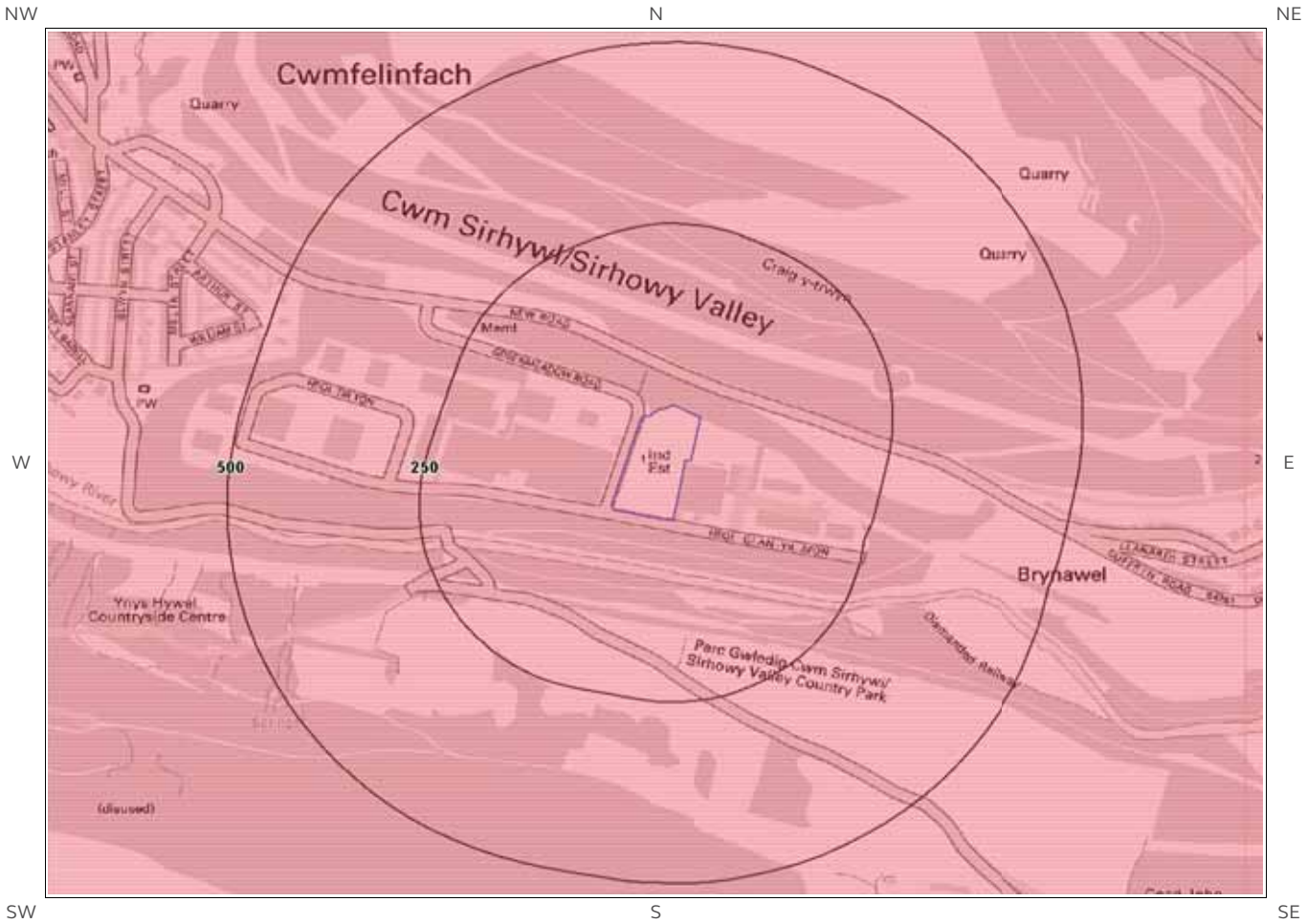
Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

5b. Aquifer Within Bedrock Geology and Abstraction Licenses



Aquifer Within Bedrock Geology and Abstraction Licenses

Mapping sourced from Ordnance Survey

Site Outline

250 / 500 Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

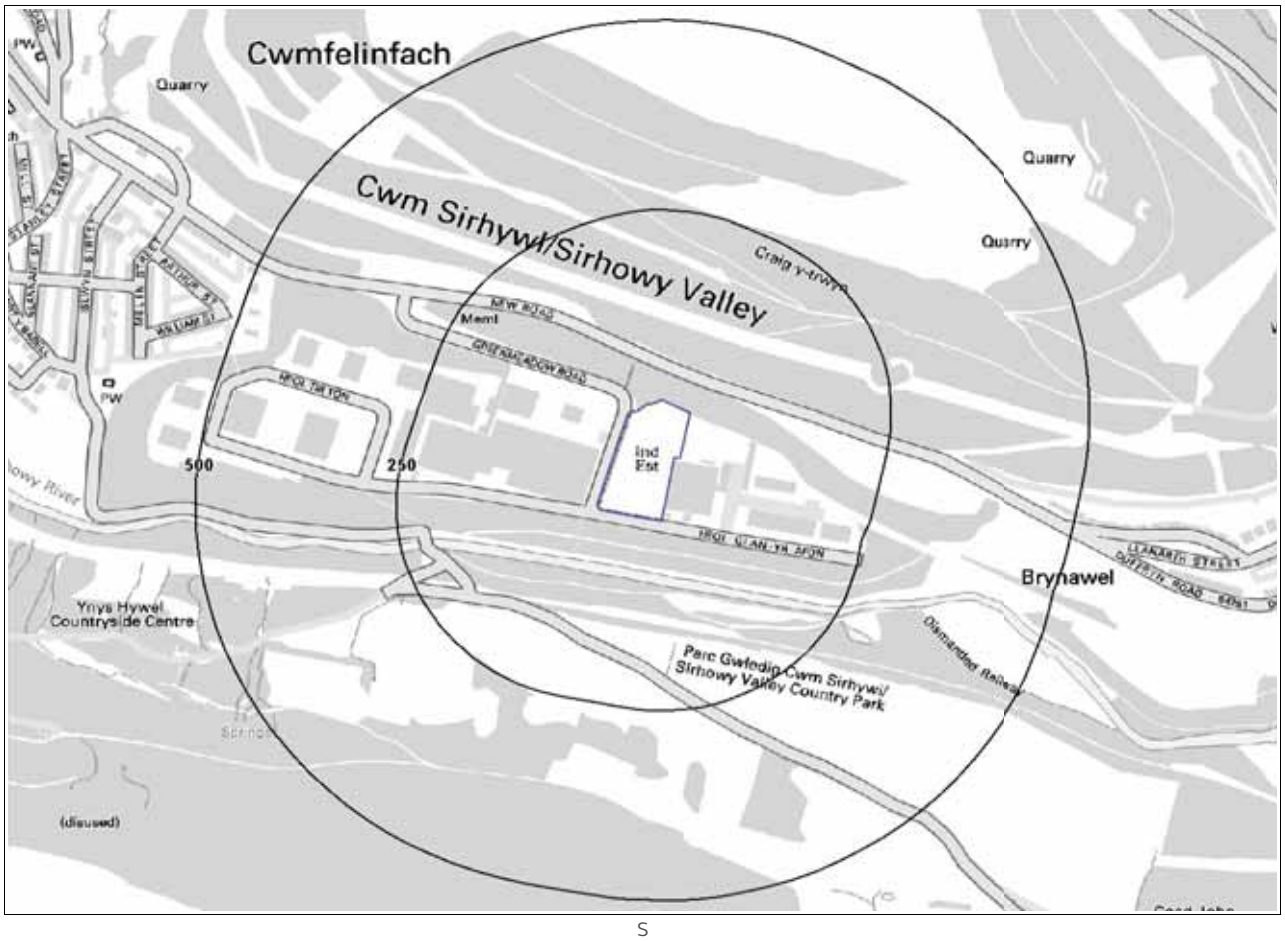
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



Map LegendSource Protection Zonesand PotableWater Abstraction Licenses

Mapping sourced from Ordnance Survey®

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

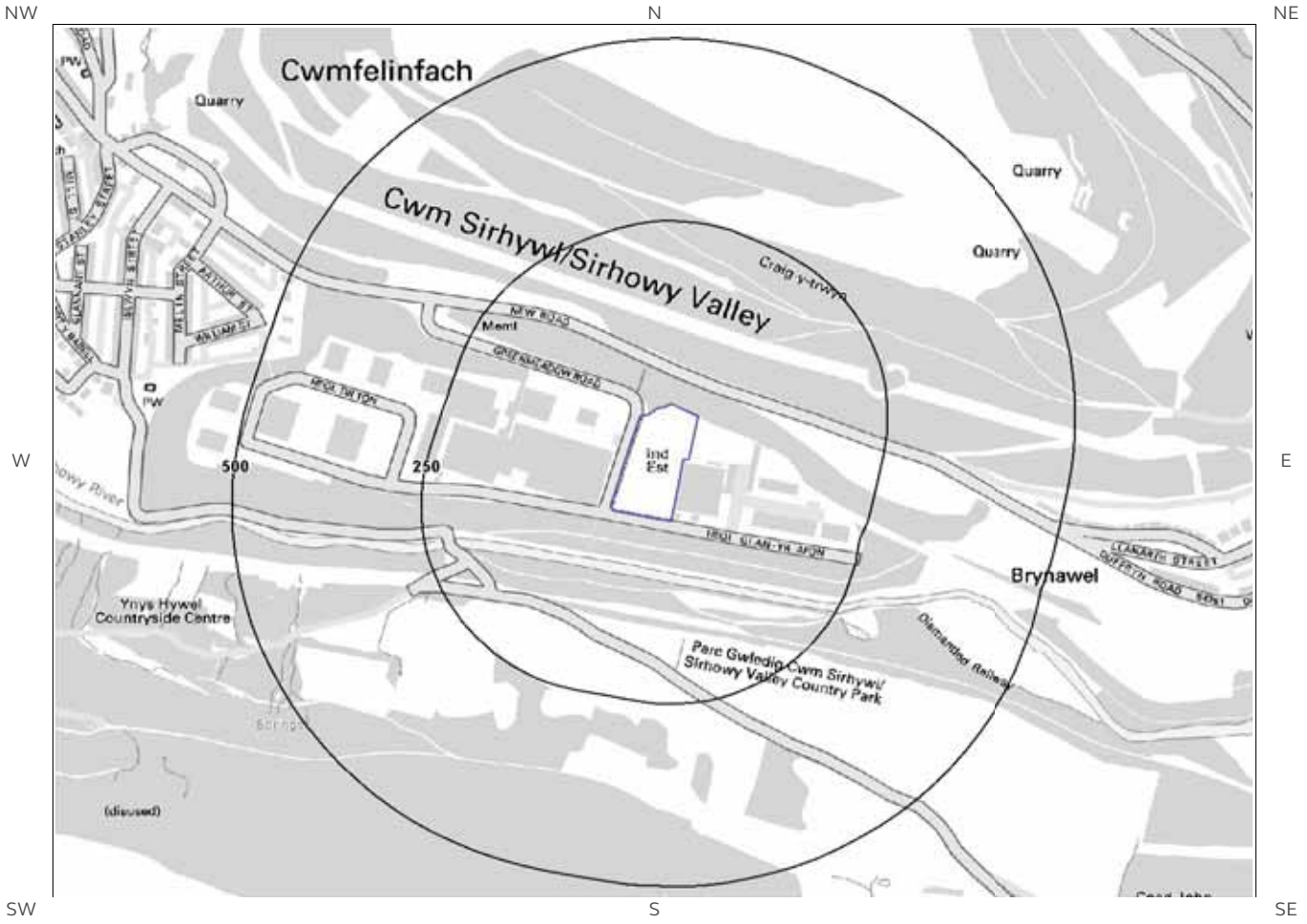
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

5d. Hydrology Source Protection Zones within confined aquifer



Hydrology Source Protection Zones

Mapping sourced from Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1C - Inner Catchment within Confined Aquifer

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

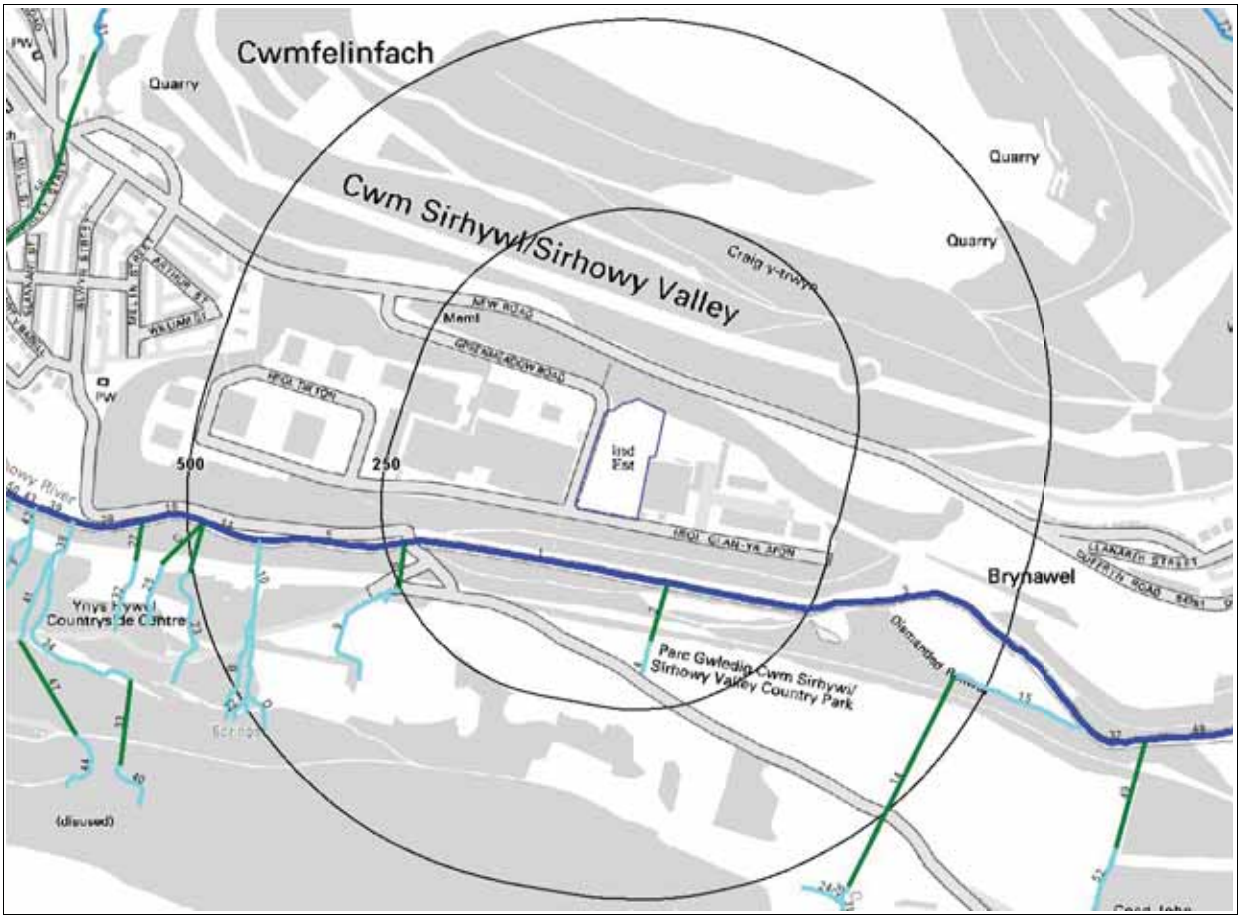
Potable Water Abstraction Licence

5 e. Hydrology – Detailed River Network and River Quality

NW N NE

W E

SW S SE



Hydrology – Detailed River Network and River Quality

Mapping sourced from Ordnance Survey

- Site Outline
- Search Buffers (m): 250, 500
- Primary River
- Secondary River
- Tertiary River
- Lake/Reservoir
- Underground River (inferred)
- General Quality Assessment: Biology
- General Quality Assessment: Chemistry
- Canal
- Canal Tunnel
- Culvert
- Multiple Channel Culvert
- Underground River (Potential Sewer)
- Underground River (local knowledge)

5. Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

5.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site?

No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

5.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
0	On Site	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.

5.9 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? Yes

5.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	1410.0	E	320700 191300	River Name: Sirhowy Reach: Ebbw Fawr Conf.-nant Hafod Tudor End/Start of Stretch: Start of Stretch NGR	B	B	B	B	B
Not shown	1410.0	E	320700 191300	River Name: Sirhowy Reach: Nant Hafod Tudor - Ynys Ddu Br. End/Start of Stretch: End of Stretch NGR	B	B	B	B	B

5.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
Not shown	1410.0	E	320700 191300	River Name: Sirhowy Reach: Ebbw Fawr Conf.-nant Hafod Tudor End/Start of Stretch: Start of Stretch NGR	B	B	B	B	-
Not shown	1410.0	E	320700 191300	River Name: Sirhowy Reach: Nant Hafod Tudor - Ynys Ddu Br. End/Start of Stretch: End of Stretch NGR	B	B	B	B	-

5.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?	Yes

The following Detailed River Network records are represented on the Hydrology Map (5e):

ID	Distance (m)	Direction	Details	
1	73.0	S	River Name: Sirhowy River Welsh River Name: Afon Sirhywi Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
2	92.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
3	92.0	SE	River Name: Sirhowy River Welsh River Name: Afon Sirhywi Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
4	160.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
5	225.0	W	River Name: Sirhowy River Welsh River Name: Afon Sirhywi Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
6	225.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
7A	252.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
8A	263.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
9	263.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10	408.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11	408.0	W	River Name: Sirhowy River Welsh River Name: Afon Sirhywi Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
12 B	443.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 B	443.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14	457.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
15	457.0	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16	479.0	W	River Name: Sirhowy River Welsh River Name: Afon Sirhywi Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
17 C	479.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
18 C	479.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
19 D	483.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
20 D	490.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
21 D	497.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
22	498.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

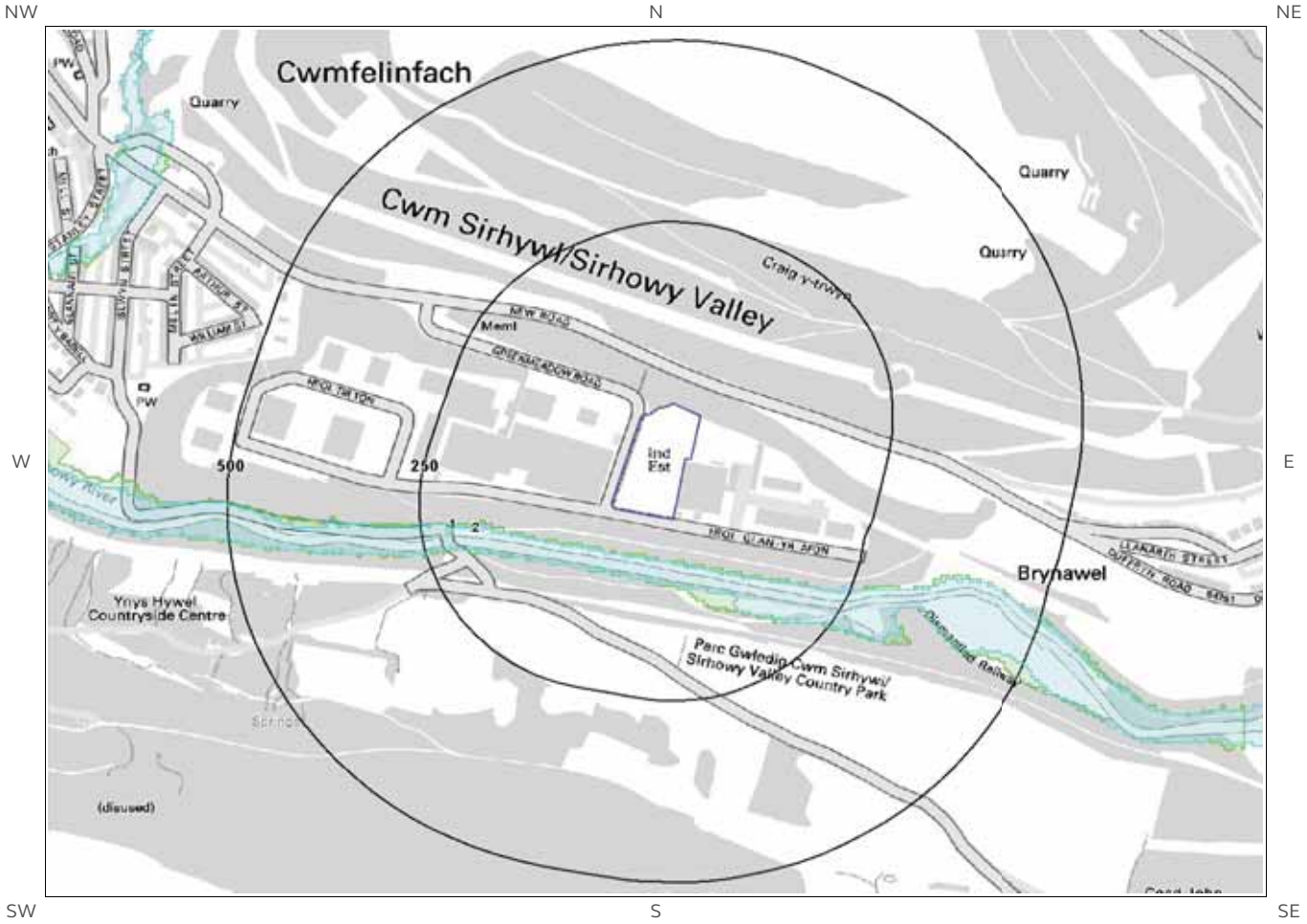
5.11 Surface Water Features

Are there any surface water features within 250m of the study site? Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
66.0	S
160.0	S
220.0	W

6. Environment Agency Flood Map for planning (from rivers and the sea)



Environment Agency Flood Map for planning (from rivers and the sea)

Mapping sourced from Ordnance Survey

- Site Outline
- Search Buffers (m): 250, 500
- Zone 2 Floodplain
- Zone 3 Floodplain
- Flood Storage Area
- Area Benefiting from Flood Defences
- Flood Defences

6. Flooding

6.1 Zone 2 Flooding

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning:

Is the site within 250m of an Environment Agency Zone 2 floodplain? Yes

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
1	52.0	S	10-Feb-2015	Zone 2 - (Fluvial / Tidal Models)

6.2 Zone 3 Flooding

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning.

Is the site within 250m of an Environment Agency Zone 3 floodplain? Yes

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
2	56.0	S	10-Feb-2015	Zone 3 - (Fluvial Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

6.5 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

---

6.6 Groundwater Flooding Susceptibility Areas

6.6.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site?

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

6.6.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Low

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

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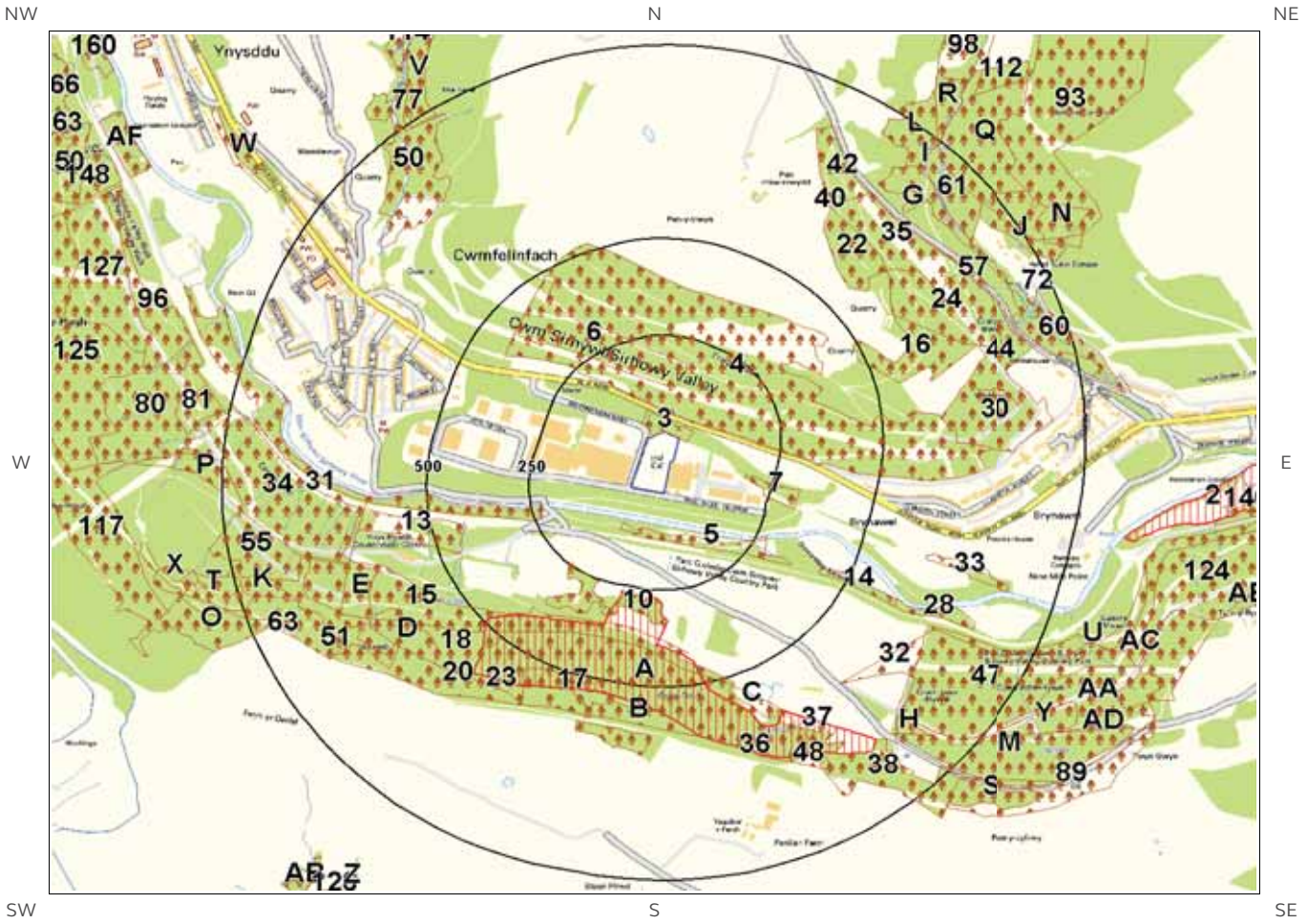
7. Designated Environmentally Sensitive Sites Map



Designated Environmentally Sensitive Sites Map

Mapping sourced from Ordnance Survey

Site Centre
Site Outline
100
250
Search Buffers (m)

AONB
National Park
SSSI
Special Protection Areas
Nitrate Vulnerable Zones
Green Belt
Environmentally Sensitive Areas
Special Areas of Conservation
World Heritage Sites
Nitrate Sensitive Areas
Ancient Woodland
National Nature Reserve
Local Nature Reserves
RAMSAR Sites

7. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?	Yes

7.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

7.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

7.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

7.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

7.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

7.6 Records of Ancient Woodland within 2000m of the study site:

200

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
3	0.0	On Site	Unknown	Ancient and Semi-Natural Woodland
4	49.0	NE	Unknown	Ancient Replanted Woodland
5	91.0	S	Unknown	Ancient and Semi-Natural Woodland
6	118.0	N	Unknown	Other Ancient Woodland
7	177.0	E	Unknown	Ancient and Semi-Natural Woodland
8	223.0	W	Unknown	Ancient and Semi-Natural Woodland
9	245.0	SW	Unknown	Ancient and Semi-Natural Woodland
10	264.0	S	Unknown	Ancient and Semi-Natural Woodland
11	351.0	S	Unknown	Ancient and Semi-Natural Woodland
12A	390.0	S	Unknown	Ancient and Semi-Natural Woodland
13	417.0	W	Unknown	Ancient and Semi-Natural Woodland
14	427.0	SE	Unknown	Ancient and Semi-Natural Woodland
15	473.0	SW	Unknown	Ancient Replanted Woodland
16	481.0	NE	Unknown	Ancient Replanted Woodland
17	503.0	S	Unknown	Restored Ancient Woodland Site
18	519.0	SW	Unknown	Ancient Replanted Woodland
19C	523.0	S	GRAIG-GOCH	Ancient Replanted Woodland
20	540.0	S	GRAIG-GOCH	Ancient Replanted Woodland
21B	549.0	S	GRAIG-GOCH	Ancient Replanted Woodland
22	570.0	NE	Unknown	Other Ancient Woodland
23	577.0	SW	Unknown	Ancient and Semi-Natural Woodland
24	612.0	NE	Unknown	Ancient Replanted Woodland
25B	616.0	S	Unknown	Ancient and Semi-Natural Woodland
26C	622.0	SE	GRAIG-GOCH	Ancient Replanted Woodland
27D	622.0	SW	Unknown	Ancient Replanted Woodland
28	629.0	SE	Unknown	Ancient and Semi-Natural Woodland
29E	640.0	SW	Unknown	Ancient Replanted Woodland
30	642.0	E	Unknown	Restored Ancient Woodland Site
31	648.0	W	COED CAE-HUGH	Ancient Replanted Woodland
32	652.0	SE	COED JOHN HYWEL	Ancient Replanted Woodland
33	659.0	E	Unknown	Ancient and Semi-Natural Woodland
34	664.0	W	Unknown	Ancient Replanted Woodland
35	669.0	NE	Unknown	Other Ancient Woodland
36	678.0	S	GRAIG-GOCH	Ancient Replanted Woodland
37	679.0	SE	Unknown	Restored Ancient Woodland Site
38	685.0	SE	Unknown	Ancient and Semi-Natural Woodland
39D	701.0	SW	Unknown	Ancient Replanted Woodland
40	701.0	NE	Unknown	Ancient Replanted Woodland
41D	707.0	SW	GRAIG-GOCH	Ancient Replanted Woodland
42	709.0	NE	Unknown	Other Ancient Woodland
43E	721.0	W	Unknown	Ancient Replanted Woodland
44	724.0	E	Unknown	Ancient Replanted Woodland
45F	724.0	SW	Unknown	Ancient Replanted Woodland
46	730.0	SE	Unknown	Ancient Replanted Woodland
47	734.0	SE	Unknown	Ancient Replanted Woodland
48	758.0	SE	GRAIG-GOCH	Ancient Replanted Woodland
49M	761.0	SE	Unknown	Ancient Replanted Woodland
50	780.0	NW	Unknown	Ancient and Semi-Natural Woodland
51	795.0	SW	Unknown	Ancient Replanted Woodland
52F	795.0	SW	Unknown	Ancient and Semi-Natural Woodland
53G	802.0	NE	Unknown	Ancient Replanted Woodland
54H	807.0	SE	Unknown	Ancient Replanted Woodland

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
55	807.0	W	Unknown	Ancient Replanted Woodland
56G	815.0	NE	Unknown	Restored Ancient Woodland Site
57	819.0	NE	Unknown	Ancient Replanted Woodland
58H	828.0	SE	COED JOHN HYWEL	Ancient Replanted Woodland
59K	869.0	W	Unknown	Ancient Replanted Woodland
60	873.0	E	Unknown	Ancient and Semi-Natural Woodland
61	875.0	NE	Unknown	Ancient Replanted Woodland
62L	895.0	NE	Unknown	Ancient and Semi-Natural Woodland
63	904.0	SW	GRAIG-GOCH	Ancient Replanted Woodland
64J	932.0	NE	Unknown	Restored Ancient Woodland Site
65I	934.0	NE	Unknown	Restored Ancient Woodland Site
66I	937.0	NE	Unknown	Restored Ancient Woodland Site
67I	937.0	NE	Unknown	Restored Ancient Woodland Site
68O	943.0	W	Unknown	Ancient and Semi-Natural Woodland
69P	950.0	W	COED CAE-HUGH	Ancient Replanted Woodland
70Q	952.0	NE	Unknown	Ancient Replanted Woodland
71J	961.0	NE	Unknown	Restored Ancient Woodland Site
72	963.0	NE	Unknown	Ancient Replanted Woodland
73K	966.0	W	Unknown	Ancient Replanted Woodland
74V	985.0	NW	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
75T	985.0	W	GRAIG-GOCH	Ancient Replanted Woodland
76R	988.0	NE	Unknown	Ancient and Semi-Natural Woodland
77	989.0	NW	Unknown	Ancient and Semi-Natural Woodland
78L	990.0	NE	Unknown	Restored Ancient Woodland Site
79M	992.0	SE	Unknown	Ancient Replanted Woodland
80	995.0	W	Unknown	Ancient Replanted Woodland
81	1015.0	W	COED CAE-HUGH	Ancient Replanted Woodland
82I	1016.0	NE	Unknown	Restored Ancient Woodland Site
83Y	1020.0	SE	Unknown	Ancient Replanted Woodland
84S	1029.0	SE	Unknown	Ancient and Semi-Natural Woodland
85N	1031.0	NE	Unknown	Ancient Replanted Woodland
86N	1032.0	NE	Unknown	Ancient Replanted Woodland
87O	1037.0	W	Unknown	Ancient Replanted Woodland
88P	1039.0	W	Unknown	Ancient Replanted Woodland
89	1042.0	SE	Unknown	Ancient and Semi-Natural Woodland
90Q	1046.0	NE	Unknown	Restored Ancient Woodland Site
91R	1048.0	NE	Unknown	Restored Ancient Woodland Site
92S	1050.0	SE	Unknown	Ancient Replanted Woodland
93	1053.0	NE	COED NANT HAFOD-TUDUR	Ancient Replanted Woodland
94AA	1068.0	SE	Unknown	Other Ancient Woodland
95T	1068.0	W	Unknown	Ancient Replanted Woodland
96	1095.0	W	COED CAE-HUGH	Ancient Replanted Woodland
97X	1099.0	W	GRAIG-GOCH	Ancient Replanted Woodland
98	1102.0	NE	COED NANT HAFOD-TUDUR	Ancient Replanted Woodland
99U	1111.0	E	COED JOHN HYWEL	Ancient Replanted Woodland
100R	1111.0	NE	Unknown	Restored Ancient Woodland Site
101U	1111.0	E	Unknown	Ancient and Semi-Natural Woodland
102R	1113.0	NE	Unknown	Restored Ancient Woodland Site
103R	1119.0	NE	Unknown	Restored Ancient Woodland Site
104V	1123.0	NW	Unknown	Ancient and Semi-Natural Woodland
105W	1124.0	NW	Unknown	Restored Ancient Woodland Site
106W	1126.0	NW	Unknown	Ancient and Semi-Natural Woodland

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
107R	1130.0	NE	Unknown	Restored Ancient Woodland Site
108T	1130.0	W	Unknown	Ancient Replanted Woodland
109X	1132.0	W	GRAIG-GOCH	Ancient Replanted Woodland
110	1141.0	E	Unknown	Ancient Replanted Woodland
111O	1143.0	W	Unknown	Ancient Replanted Woodland
112	1144.0	NE	Unknown	Ancient Replanted Woodland
113Y	1144.0	SE	Unknown	Ancient Replanted Woodland
114	1149.0	NW	Unknown	Ancient and Semi-Natural Woodland
115AD	1163.0	SE	Unknown	Ancient Replanted Woodland
116X	1172.0	W	Unknown	Ancient Replanted Woodland
117	1179.0	W	Unknown	Ancient Replanted Woodland
Not shown	1180.0	N	Unknown	Ancient and Semi-Natural Woodland
119AC	1198.0	E	COED JOHN HYWEL	Ancient Replanted Woodland
120Z	1205.0	SW	Unknown	Ancient and Semi-Natural Woodland
121Z	1220.0	SW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1223.0	NW	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
123AA	1223.0	SE	Unknown	Ancient Replanted Woodland
124	1224.0	E	Unknown	Ancient Replanted Woodland
125	1230.0	W	Unknown	Ancient Replanted Woodland
126	1231.0	SW	Unknown	Restored Ancient Woodland Site
127	1234.0	W	Unknown	Ancient Replanted Woodland
128AB	1235.0	SW	Unknown	Ancient and Semi-Natural Woodland
129AB	1240.0	SW	Unknown	Ancient and Semi-Natural Woodland
130AC	1253.0	E	COED JOHN HYWEL	Ancient Replanted Woodland
Not shown	1272.0	N	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
Not shown	1276.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1277.0	SW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1282.0	N	Unknown	Ancient and Semi-Natural Woodland
135AB	1289.0	SW	Unknown	Ancient and Semi-Natural Woodland
136AD	1291.0	SE	Unknown	Other Ancient Woodland
137AD	1317.0	SE	Unknown	Ancient Replanted Woodland
138AB	1320.0	SW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1327.0	N	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
140	1329.0	E	Unknown	Ancient and Semi-Natural Woodland
141AD	1332.0	SE	COED JOHN HYWEL	Ancient Replanted Woodland
Not shown	1359.0	NW	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
Not shown	1370.0	SW	Unknown	Ancient and Semi-Natural Woodland
144AE	1397.0	E	Unknown	Ancient Replanted Woodland
145AF	1400.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1439.0	SW	Unknown	Restored Ancient Woodland Site
Not shown	1442.0	SW	Unknown	Ancient and Semi-Natural Woodland
148	1447.0	NW	Unknown	Restored Ancient Woodland Site
149AE	1464.0	E	Unknown	Other Ancient Woodland

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
150	1518.0	NW	Unknown	Restored Ancient Woodland Site
Not shown	1542.0	N	Unknown	Ancient and Semi-Natural Woodland
Not shown	1549.0	S	Unknown	Ancient and Semi-Natural Woodland
153AF	1555.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1564.0	S	Unknown	Ancient and Semi-Natural Woodland
Not shown	1579.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1586.0	SW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1597.0	SE	Unknown	Restored Ancient Woodland Site
Not shown	1605.0	NW	Unknown	Restored Ancient Woodland Site
Not shown	1610.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
160	1613.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1615.0	W	Unknown	Ancient and Semi-Natural Woodland
Not shown	1618.0	NW	Unknown	Ancient and Semi-Natural Woodland
163	1621.0	NW	Unknown	Ancient Replanted Woodland
Not shown	1622.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1622.0	S	Unknown	Ancient and Semi-Natural Woodland
166	1625.0	NW	Unknown	Ancient Replanted Woodland
Not shown	1628.0	S	Unknown	Ancient and Semi-Natural Woodland
Not shown	1641.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1653.0	E	Unknown	Ancient and Semi-Natural Woodland
Not shown	1676.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1677.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1684.0	S	Unknown	Ancient and Semi-Natural Woodland
Not shown	1684.0	E	COED JOHN HYWEL	Ancient Replanted Woodland
Not shown	1728.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1739.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1753.0	N	Unknown	Ancient and Semi-Natural Woodland
Not shown	1753.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1755.0	E	Unknown	Ancient Replanted Woodland
Not shown	1757.0	S	Unknown	Ancient and Semi-Natural Woodland
Not shown	1759.0	NW	Unknown	Ancient Replanted Woodland

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
Not shown	1763.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1777.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1777.0	N	Unknown	Ancient and Semi-Natural Woodland
Not shown	1783.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1789.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1789.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1790.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1809.0	E	Unknown	Ancient Replanted Woodland
Not shown	1813.0	E	COED JOHN HYWEL	Ancient Replanted Woodland
Not shown	1825.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1826.0	SW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1830.0	N	COED NANT Y DRAENOG	Ancient and Semi-Natural Woodland
Not shown	1830.0	NW	Unknown	Ancient and Semi-Natural Woodland
Not shown	1842.0	E	Unknown	Ancient and Semi-Natural Woodland
Not shown	1861.0	NW	Unknown	Restored Ancient Woodland Site
Not shown	1865.0	S	WELL WOOD	Ancient and Semi-Natural Woodland
Not shown	1881.0	SW	TY-CANOL WOOD	Ancient and Semi-Natural Woodland
Not shown	1923.0	NW	Unknown	Restored Ancient Woodland Site
Not shown	1938.0	E	Unknown	Ancient and Semi-Natural Woodland
Not shown	1958.0	E	Unknown	Ancient Replanted Woodland
Not shown	1978.0	SE	Unknown	Restored Ancient Woodland Site
Not shown	1980.0	E	Unknown	Ancient and Semi-Natural Woodland

7.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

2

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
1A	264.0	S	GRAIG GOCH	Natural Resources Wales
2	1123.0	E	FLATWOOD MEADOW	Natural Resources Wales

7.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

7.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

7.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

7.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.

7.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure GeoInsight, available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell*[*] hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

* This indicates an automatically generated 50m buffer and site.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build - consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property - no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.

9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site? Yes

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? Low

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

Contact Details

EmapSite
Telephone: 0118 9736883
sales@emapsite.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web:www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries

Environment Agency

National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506
Web:**www.environment-agency.gov.uk**
Email:**enquiries@environment-agency.gov.uk**

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
Email:**enquiries@phe.gov.uk**
Main switchboard**: 020 7654 8000**

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Caerffili - Caerphilly County Borough Council
Phone: 01443 815 588
Web: http://www.caerphilly.gov.uk
Address: Ty Penallta, Tredomen Park, Ystrad Mynach, CF82 7PG

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444

Standard Terms and Conditions

1 Definitions

I**n these terms and conditions unless the context otherwise requires:**

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

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

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

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

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

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

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

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

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

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

"Fees" has the meaning set out in clause 5.1.

"Groundsure" means Groundsure Limited, a company registered in England and Wales under number 03421028.

"Groundsure Materials" means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3 The Client's obligations

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

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

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

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

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

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

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

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

4 Reliance

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

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

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

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

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

5 Fees and Disbursements

5.1Groundsure shall charge and the Client shall pay fees at the rate and

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

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

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

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

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

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

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

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

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

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

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

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

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

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

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

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

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

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

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

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

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

8 Groundsure's right to suspend or terminate

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

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

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

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

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

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

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

12 General

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

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

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

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

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

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

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

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond Groundsure's reasonable control.

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

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

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

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

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

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

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

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

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

EmapSite

Masdar House,
Eversley, RG27 0RP

Report Reference: EMS-299380_404632

Your Reference: EMS_299380_404632

Report Date 20 Apr 2015

Report Delivery Method: Email - pdf

Groundsure Geoinsight

Address: ,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geoinsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Geoinsight

Groundsure Geoinsight

Address:	,
Date:	20 Apr 2015
Reference:	EMS-299380_404632
Client:	EmapSite

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	23-May-2010
Grid Reference:	319235,191305
Site Size:	1.15ha

Contents Page

Overview of Findings

The Groundsure Geoinsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology		
1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	6	0	7	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	3	0	0	5	10
2.3 Current Ground Workings	0	1	1	2	10

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	3	0	0	5	10
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Very Low
4.2 Landslides	Low
4.3 Ground Dissolution of Soluble Rocks	Negligible
4.4 Compressible Deposits	Moderate-High
4.5 Collapsible Deposits	Very Low
4.6 Running Sand	Low

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	0	0	2

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	4	1	16

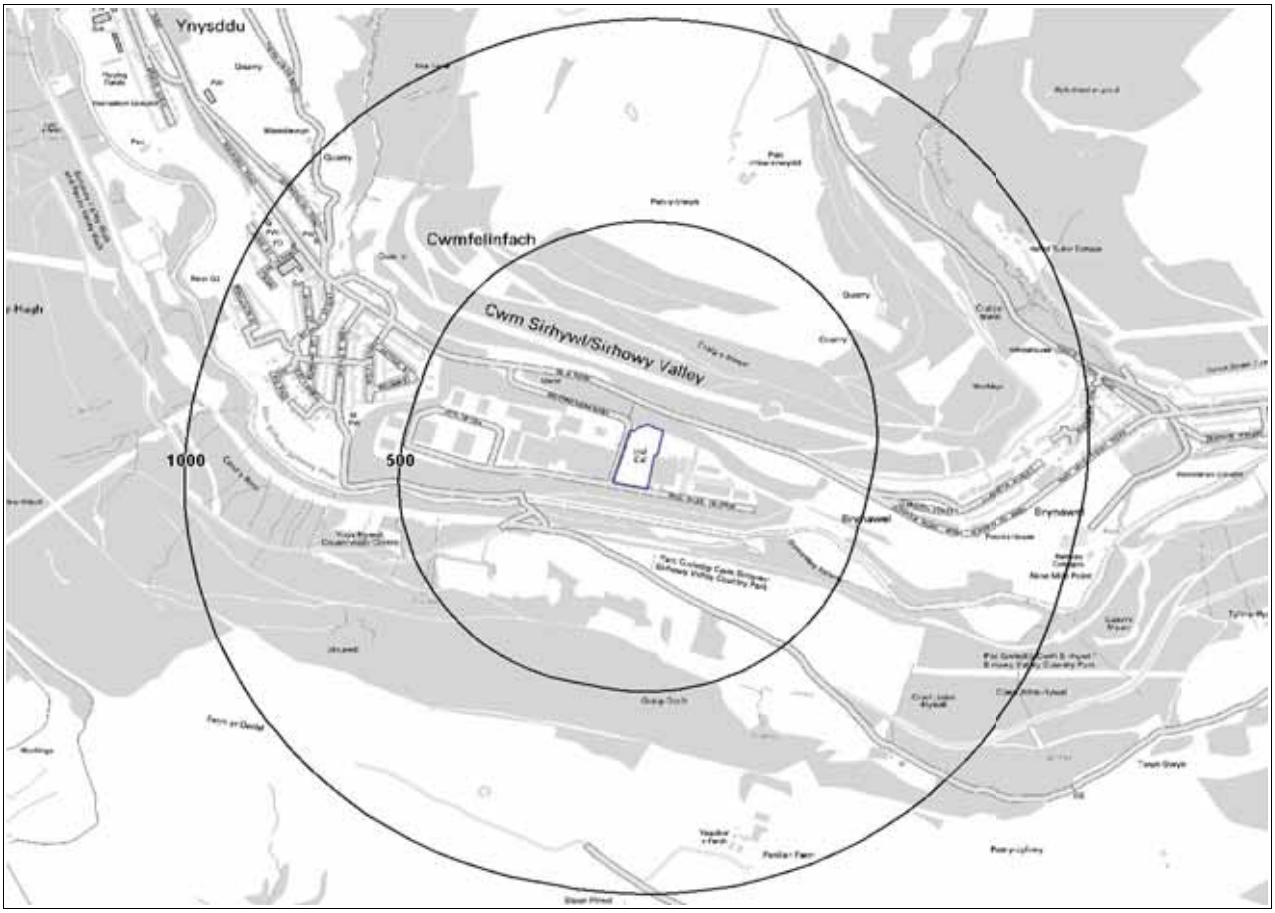
Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.1 Tunnels	0	0	0	Not Searched
7.2 Historical Railway and Tunnel Features	12	0	3	Not Searched
7.3 Historical Railways	1	0	3	Not Searched
7.4 Active Railways	0	0	0	Not Searched

Section 7:Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

1 Geology

1.1 Artificial Ground Map

NW N NE



W E

SW S SE

Artificial Ground Legend

Mapping sourced from Ordnance Survey®

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Worked Ground (undivided)

Infilled Ground

Disturbed Ground (undivided)

Landscaped Ground (undivided)

Reclaimed Ground

1 Geology

1.1 Artificial Ground

1.1.1Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:249

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

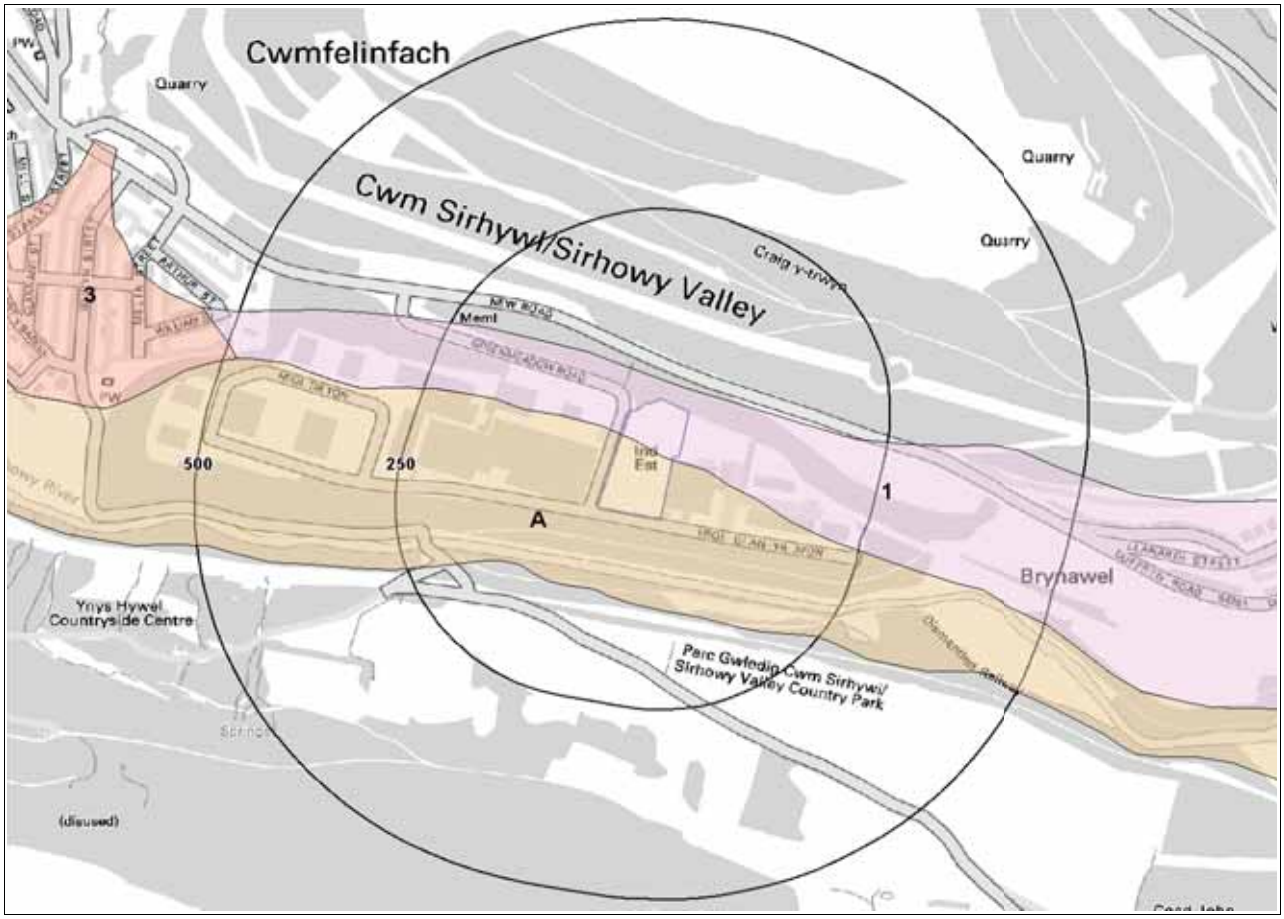
Database searched and no data found.

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

1.2 Superficial Deposits and Landslips Map



Superficial Deposits and Landslips Legend

Mapping sourced from Ordnance Survey®

Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	GFDUD	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
2A	0.0	On Site	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
3	484.0	W	ALF	ALLUVIAL FAN DEPOSITS	GRAVEL, SAND, SILT AND CLAY [UNLITHIFIED DEPOSITS CODING SCHEME]
4A	0.0	On Site	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	Very Low
0.0	On Site	Intergranular	Very High	High

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary? No

Database searched and no data found.

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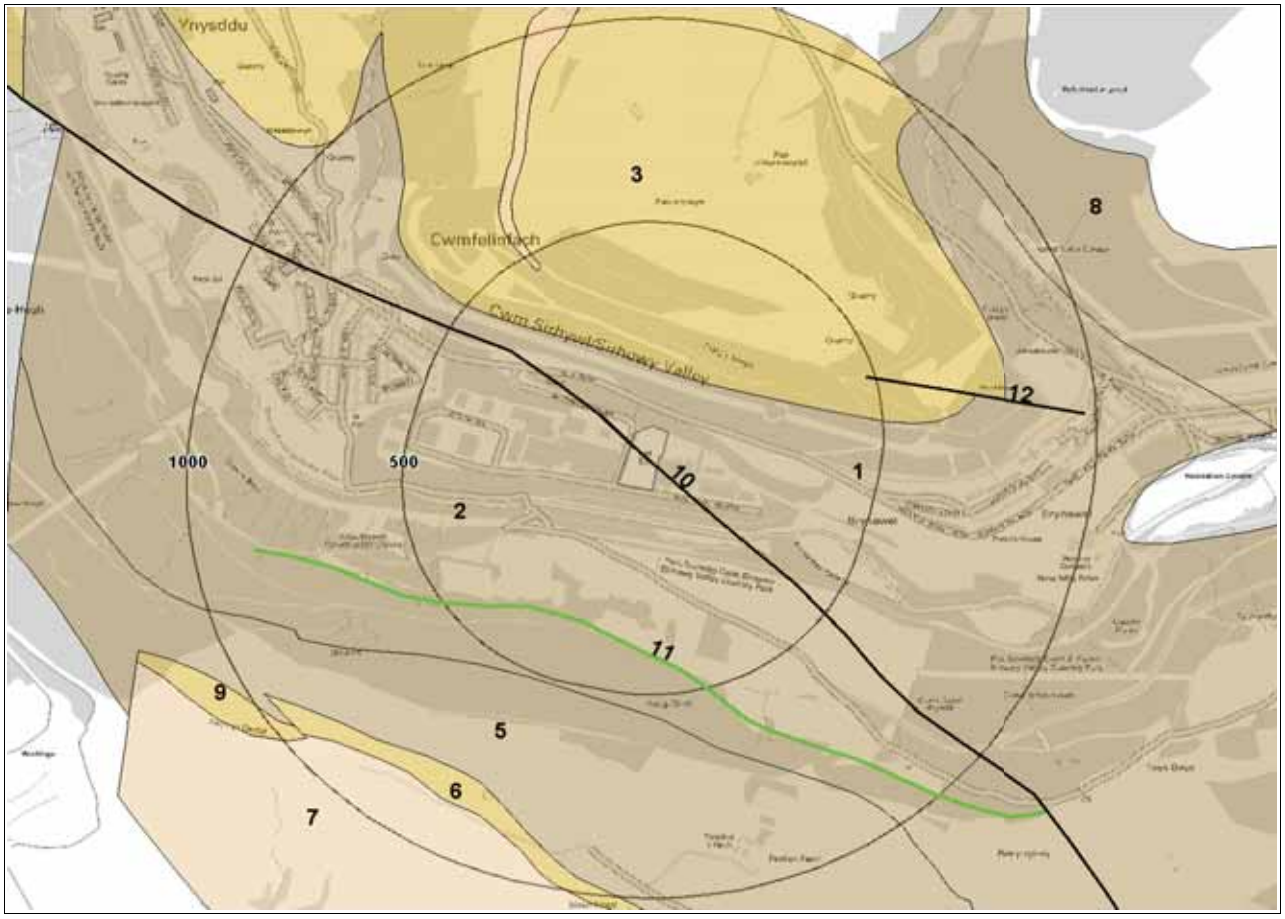
* This includes an automatically generated 50m buffer zone around the site

1.3 Bedrock and Faults Map

NW N NE

W E

SW S SE



Bedrock and Faults Legend

Mapping sourced from Ordnance Survey®

Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:249

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	BD-SDST	Brithdir Member - Sandstone	Westphalian D
2	0.0	On Site	BD-SDST	Brithdir Member - Sandstone	Westphalian D
3	137.0	N	H-SDST	Hughes Member - Sandstone	Westphalian D
4	457.0	NW	H-MDSS	Hughes Member - Mudstone, Siltstone And Sandstone	Westphalian D

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	High	Moderate

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	Category Description	Feature Description
10	0.0	On Site	FAULT	Fault, inferred, displacement unknown
11	345.0	S	ROCK	Coal seam, inferred
12	480.0	E	FAULT	Fault, inferred, displacement unknown

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

* This includes an automatically generated 50m buffer zone around the site

1.4 Radon Data

1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

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1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary

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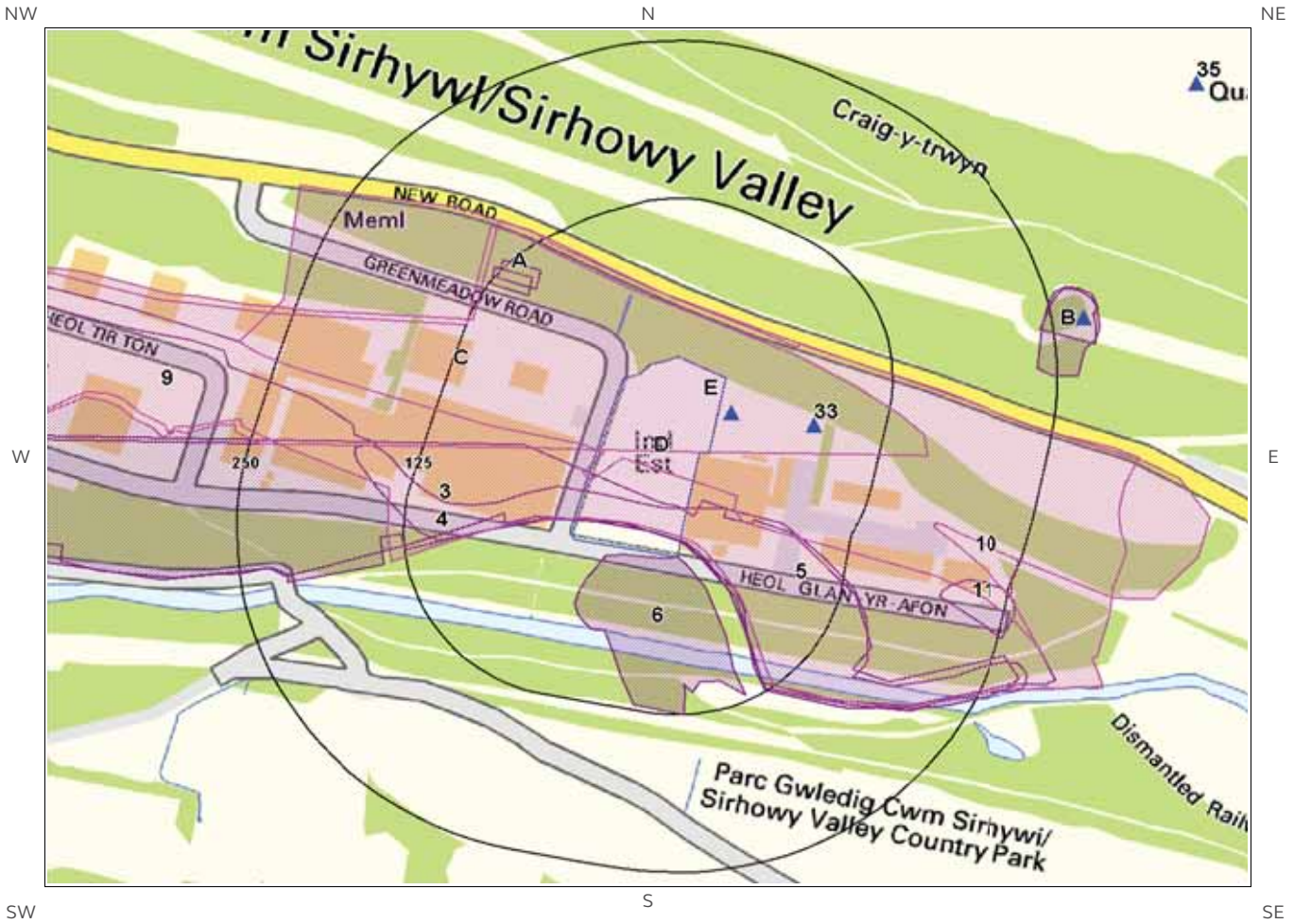
2 Ground Workings Map



Ground Workings Legend

Mapping sourced from Ordnance Survey®

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
1C	0.0	On Site	318985 191398	Colliery	1948
2D	0.0	On Site	319166 191301	Colliery	1922
3	0.0	On Site	319044 191278	Refuse Heap	1965
4	0.0	On Site	318881 191217	Refuse Heap	1948
5	0.0	On Site	319327 191211	Refuse Heap	1915
6	0.0	On Site	319243 191165	Refuse Heap	1965
7A	96.0	NW	319137 191451	Reservoir	1922
8A	96.0	NW	319130 191446	Reservoir	1948
9	159.0	W	318848 191375	Refuse Heap	1948
10	179.0	E	319481 191224	Refuse Heap	1965
11	199.0	E	319481 191186	Unspecified Heap	1982
12B	235.0	E	319550 191406	Unspecified Heap	1965
13B	240.0	E	319550 191417	Unspecified Disused Quarry	1982

2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
14C	0.0	On Site	318985 191398	Colliery	1948
15D	0.0	On Site	319166 191301	Colliery	1922
16E	0.0	On Site	319291 191338	Unspecified Mine	1965
Not shown	472.0	SW	318681 190874	Colliery	1898
Not shown	475.0	SW	318666 190888	Colliery	1922
Not shown	475.0	SW	318666 190888	Colliery	1915
Not shown	493.0	SW	318736 190989	Old Coal Level	1948
Not shown	493.0	SW	318736 190989	Old Coal Level	1898
Not shown	523.0	SW	318727 190964	Old Coal Level	1922
Not shown	523.0	SW	318727 190964	Old Coal Level	1915
Not shown	670.0	SW	318614 190852	Unspecified Level	1898
Not shown	670.0	SW	318614 190852	Unspecified Level	1948
Not shown	673.0	SW	318614 190848	Unspecified Level	1915
Not shown	673.0	SW	318614 190848	Unspecified Level	1922
Not shown	738.0	SW	318521 190878	Old Coal Level	1898
Not shown	944.0	NW	318788 192217	Old Trial Level	1948
Not shown	948.0	NW	318792 192222	Old Trial Level	1922
Not shown	954.0	NW	318783 192222	Old Trial Level	1899

2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
32E	10.0	E	319296 191341	Coal, Deep	Nine Mile Point Colliery West Shaft	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
33	73.0	E	319358 191331	Coal, Deep	Nine Mile Point Colliery East Shaft	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
34B	273.0	E	319561 191416	Sandstone	Craig y Trwyn	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
35	423.0	NE	319645 191602	Sandstone	Craig y Trwyn	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	511.0	SW	318734 190989	Coal, Deep	Wenloog Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	615.0	SW	318708 190846	Coal, Deep	Wentloog Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	615.0	NE	319794 191725	Sandstone	Pen y Trwyn	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	635.0	NE	319869 191633	Sandstone	Craig y Trwyn	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	686.0	SW	318614 190851	Coal, Deep	Wenloog Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	750.0	SW	318522 190878	Coal, Deep	Wenloog Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	753.0	NW	318576 191768	Sandstone	Tir-Frederick	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	809.0	E	320101 191390	Sandstone	Craig y Trwyn	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

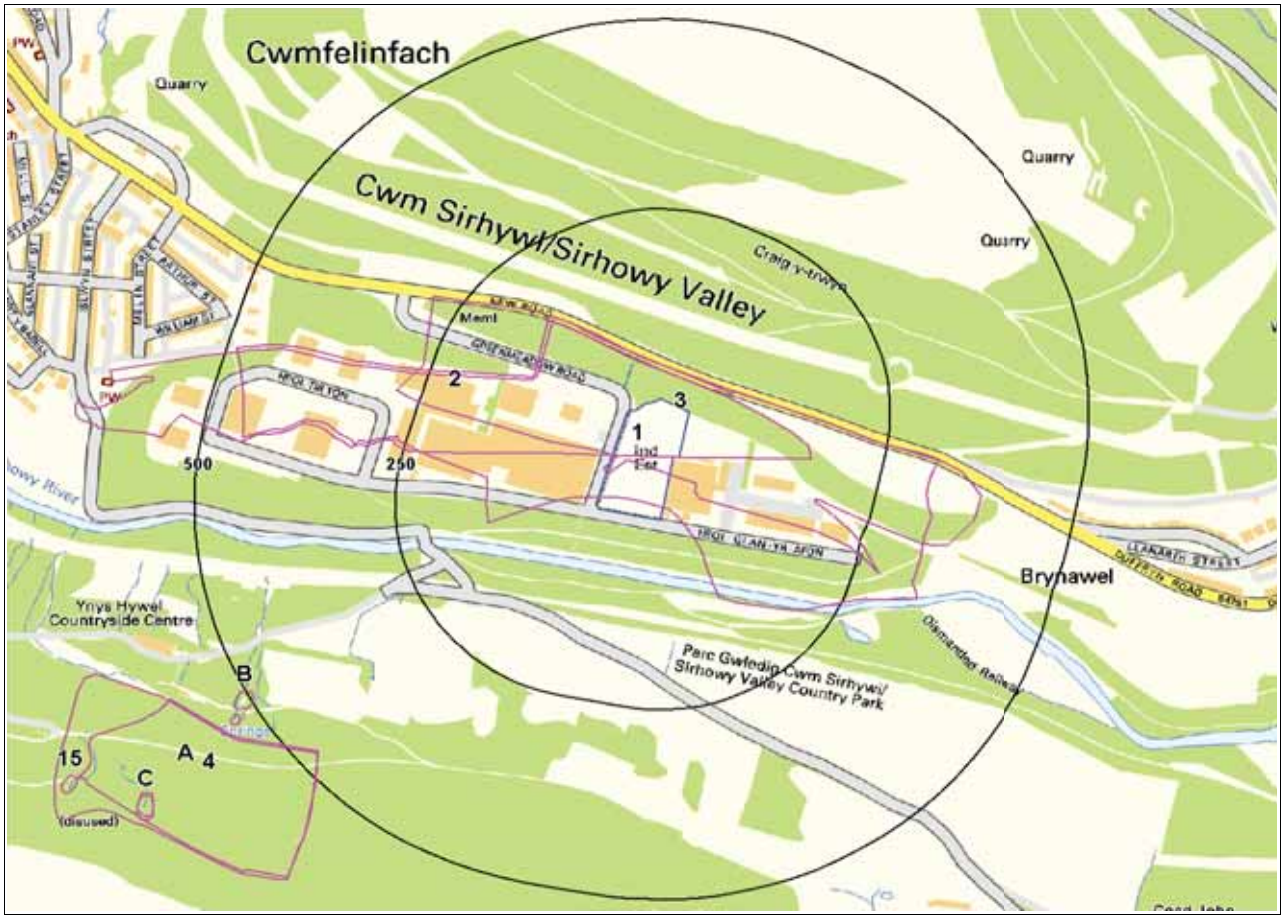
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	884.0	W	318331 190987	Sandstone	Coed y Bont	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	948.0	NW	318610 192099	Sandstone	Ton-teg	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

3 Mining, Extraction & Natural Cavities Map

NW N NE

W E

SW S SE



Mining, Extraction and Natural Cavities Legend

Mapping sourced from Ordnance Survey®

Site Outline

250 / 500 Search Buffers (m)

Historical Mining

Non-Coal Mining Cavities

Natural Cavities

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
1	0.0	On Site	319166 191301	Colliery	1922
2	0.0	On Site	318985 191398	Colliery	1948
3	0.0	On Site	319291 191338	Unspecified Mine	1965
4	472.0	SW	318681 190874	Colliery	1898
5A	475.0	SW	318666 190888	Colliery	1922
6A	475.0	SW	318666 190888	Colliery	1915
7B	493.0	SW	318736 190989	Old Coal Level	1898
8B	493.0	SW	318736 190989	Old Coal Level	1948
9B	523.0	SW	318727 190964	Old Coal Level	1922
10B	523.0	SW	318727 190964	Old Coal Level	1915
11C	670.0	SW	318614 190852	Unspecified Level	1898
12C	670.0	SW	318614 190852	Unspecified Level	1948
13C	673.0	SW	318614 190848	Unspecified Level	1922
14C	673.0	SW	318614 190848	Unspecified Level	1915
15	738.0	SW	318521 190878	Old Coal Level	1898
Not shown	944.0	NW	318788 192217	Old Trial Level	1948
Not shown	948.0	NW	318792 192222	Old Trial Level	1922
Not shown	954.0	NW	318783 192222	Old Trial Level	1899

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

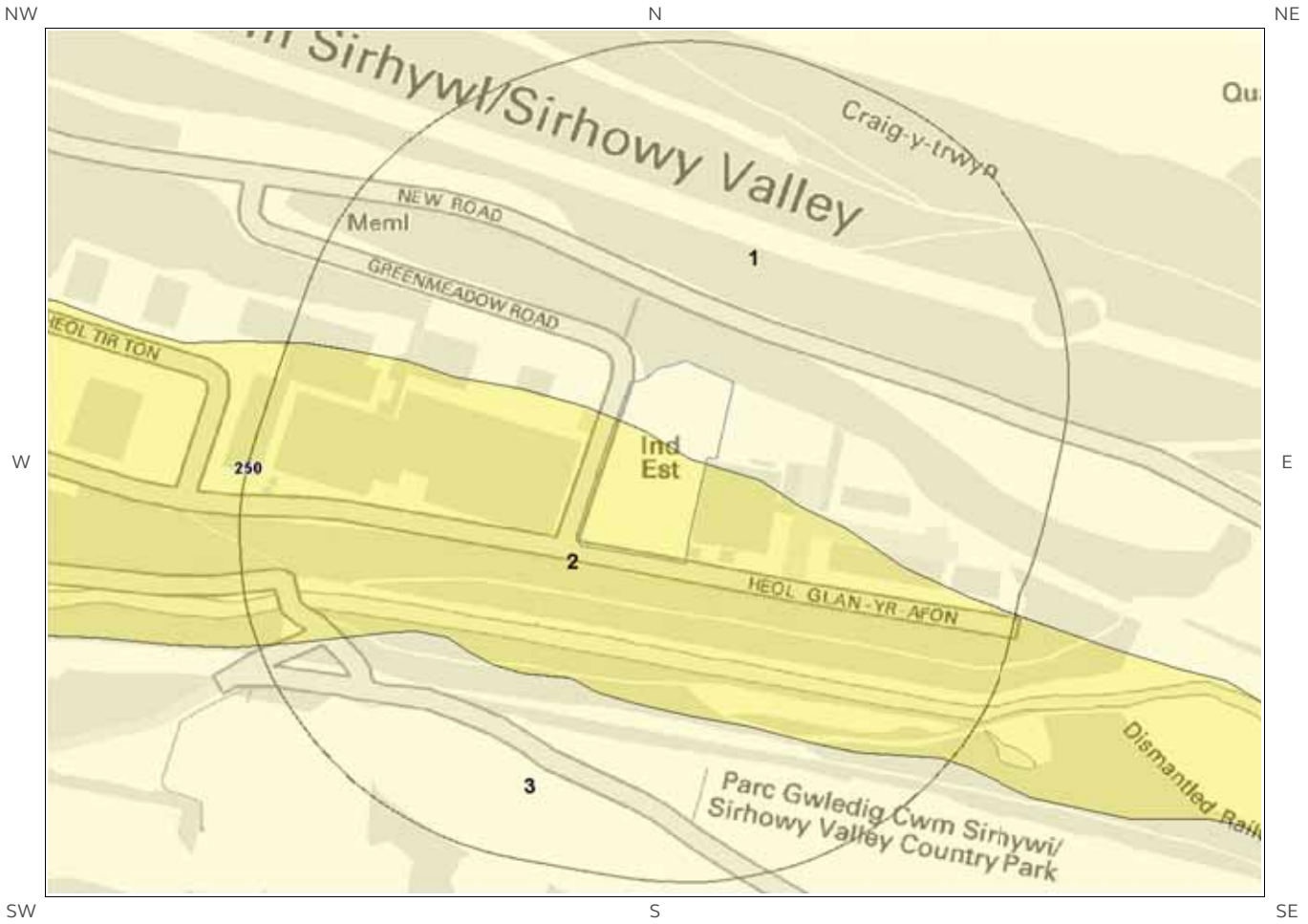
Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map



Shrink Swell Clay Legend

Mapping sourced from Ordnance Survey

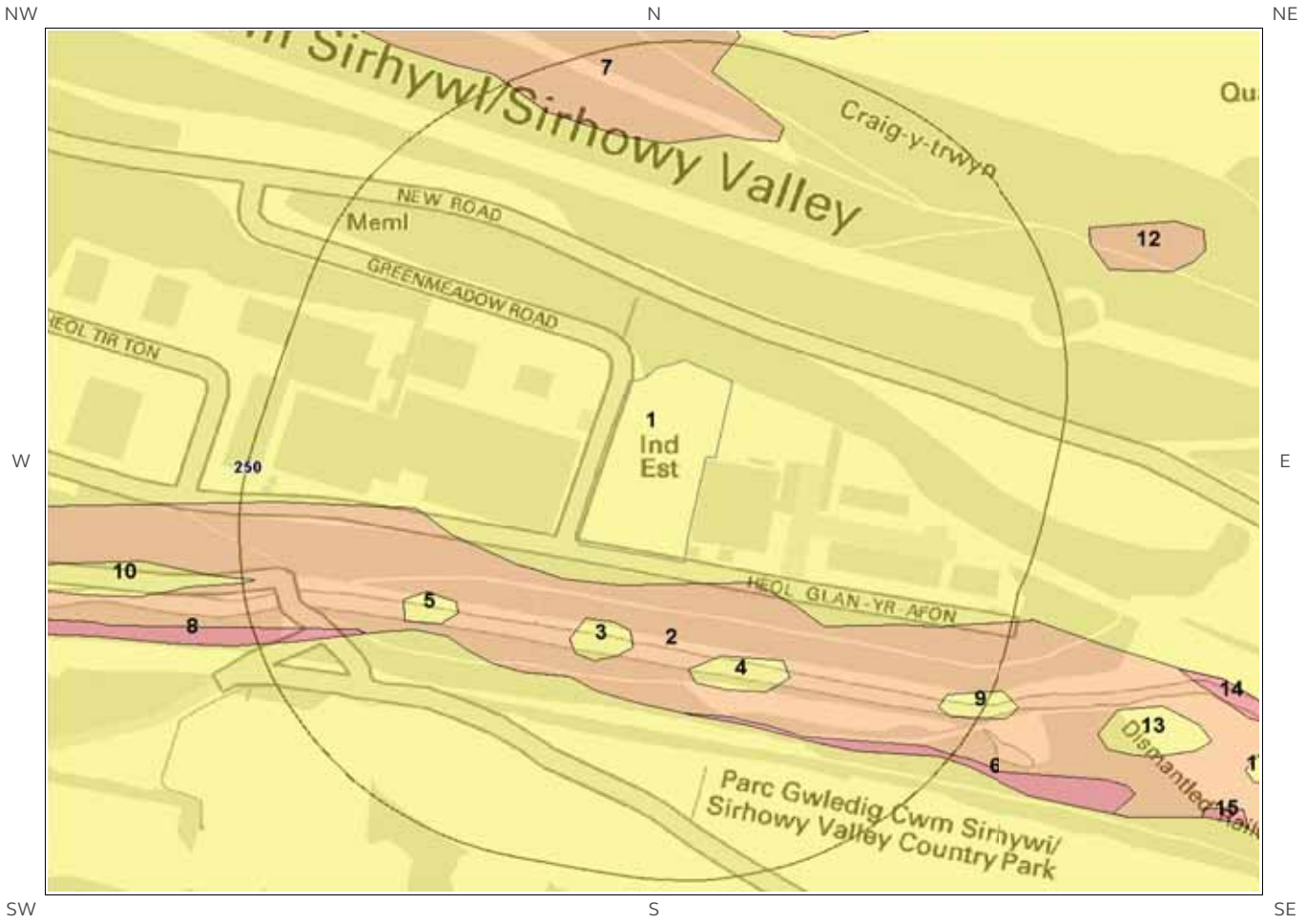
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.2 Landslides Map



Landslides Legend

Mapping sourced from Ordnance Survey

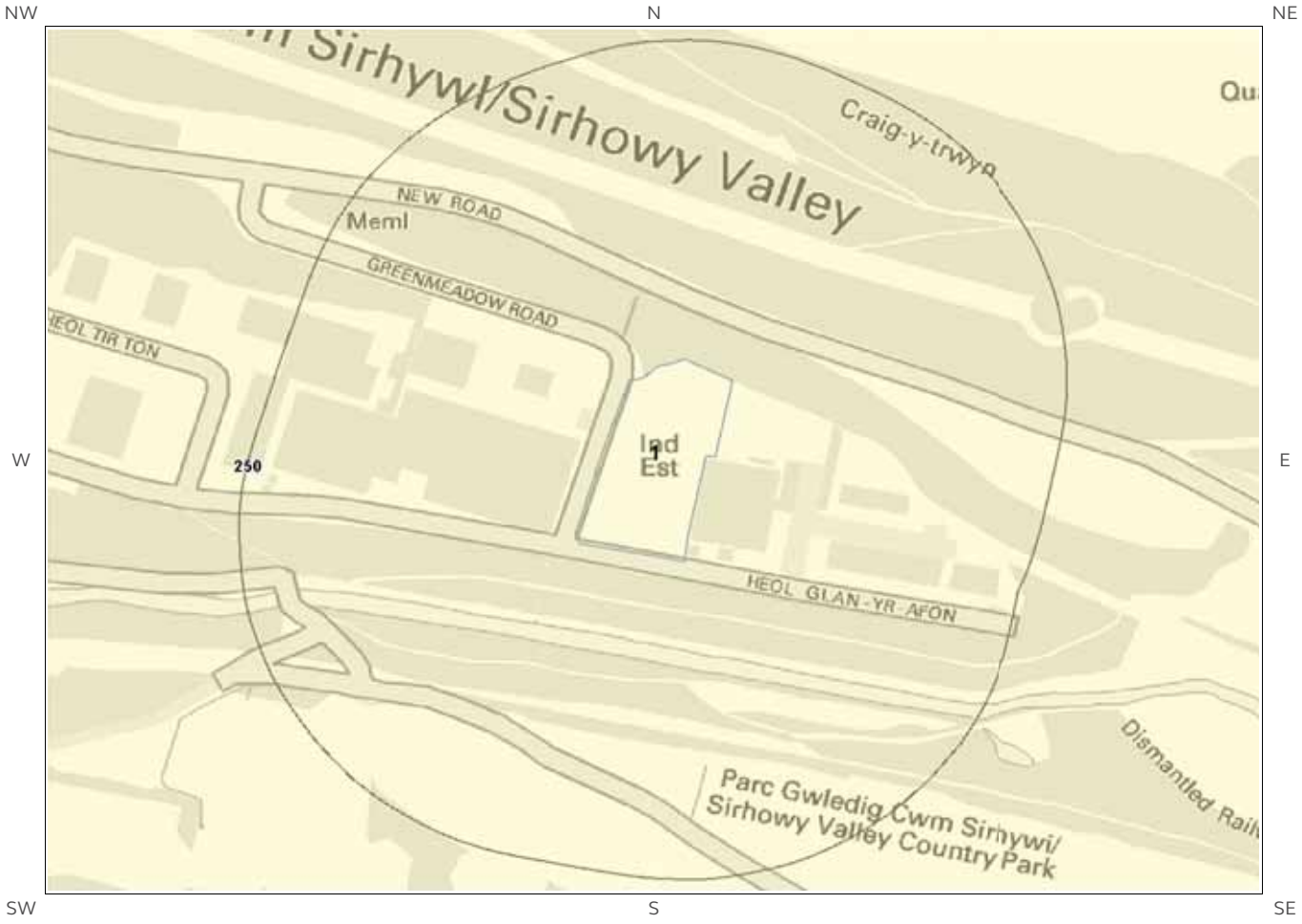
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.3 Ground Dissolution Soluble Rocks Map



Ground Dissolution Soluble Rocks Legend

Mapping sourced from Ordnance Survey®

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

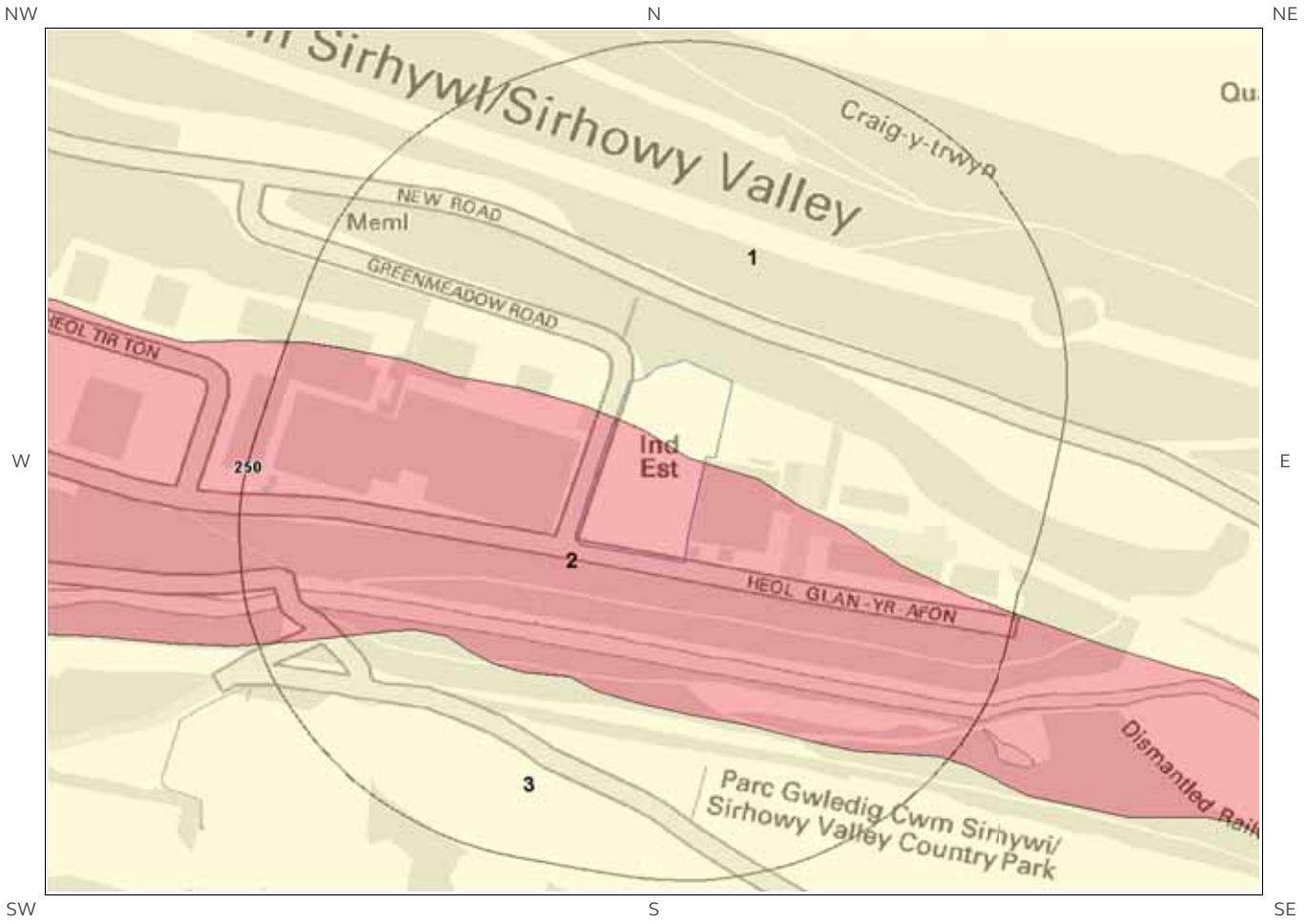
Very Low

Low

Moderate

High

4.4 Compressible Deposits Map



Compressible Deposits Legend

Mapping sourced from Ordnance Survey

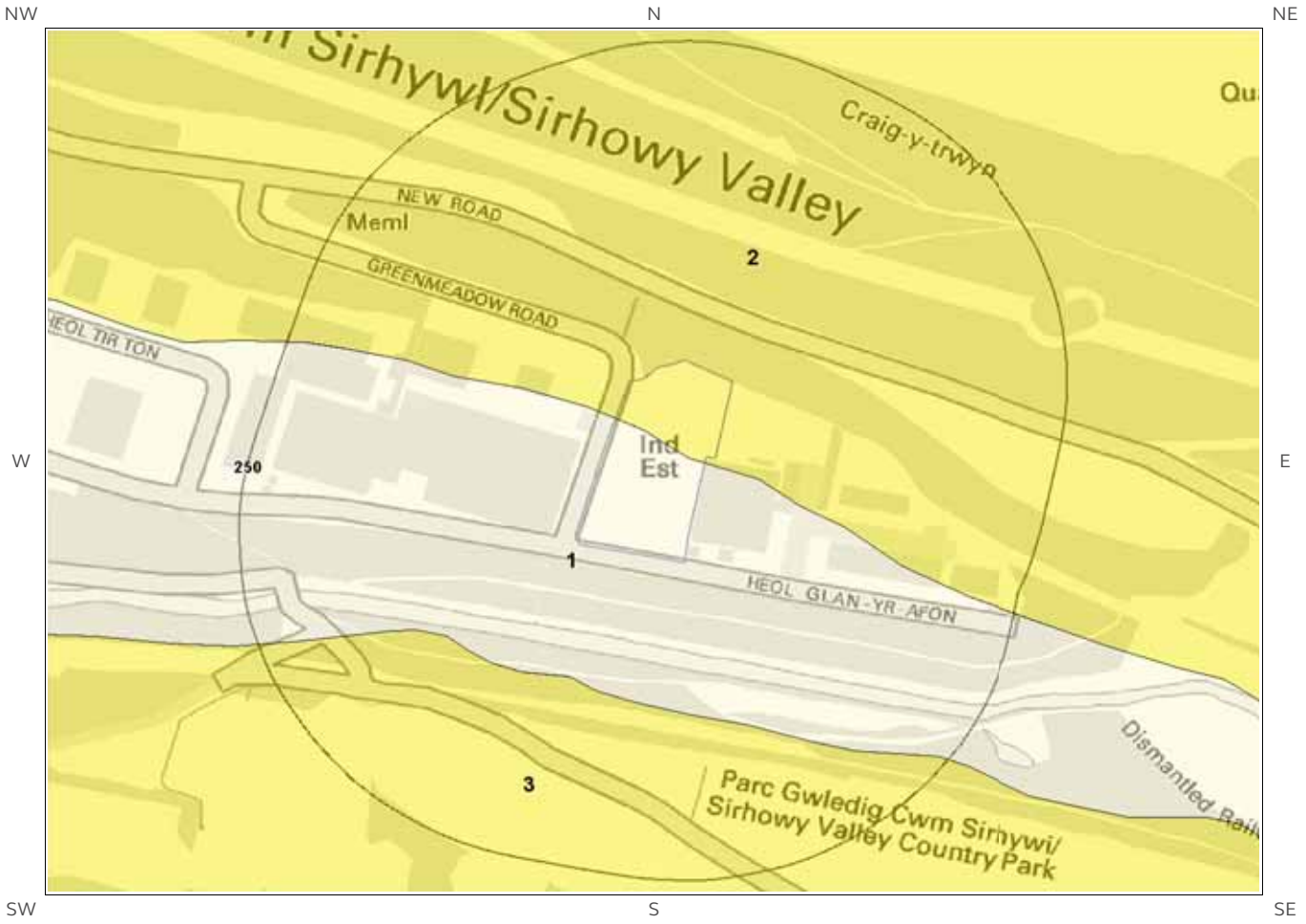
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.5 Collapsible Deposits Map



Collapsible Deposits Legend

Mapping sourced from Ordnance Survey

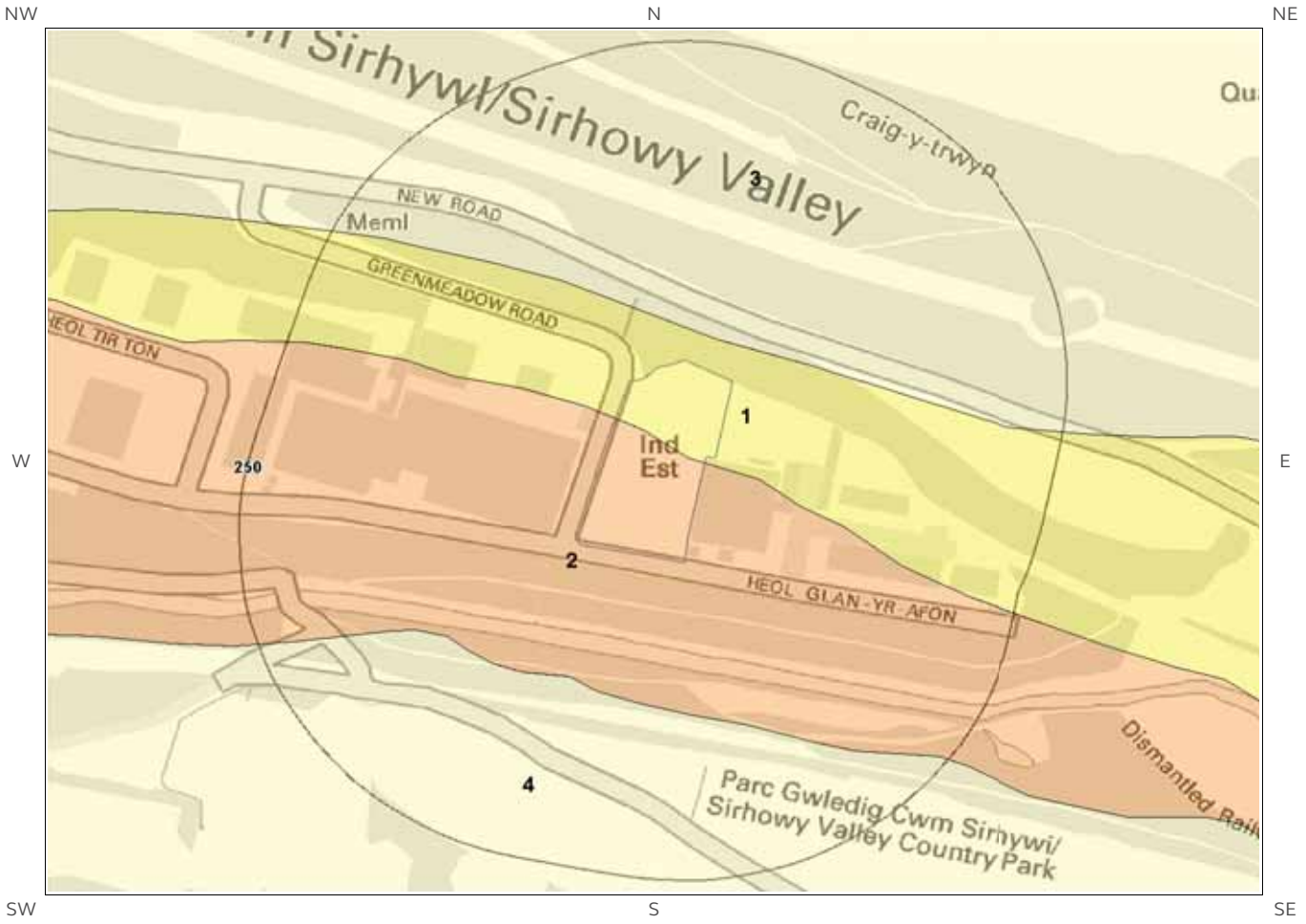
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.6 Running Sand Map



Running Sand Legend

Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site*[*] boundary? Moderate-High

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	17.0	S	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to the ground, such as drainage or excavations, take place. Possible increase in construction cost to reduce potential slope stability problems. For existing property, no significant increase in insurance risk due to natural slope instability problems.

* This includes an automatically generated 50m buffer zone around the site

4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.
2	0.0	On Site	Moderate-High	Significant potential for compressibility problems. Do not drain, load or de-water ground near the property without technical advice. For new build, consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property, possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

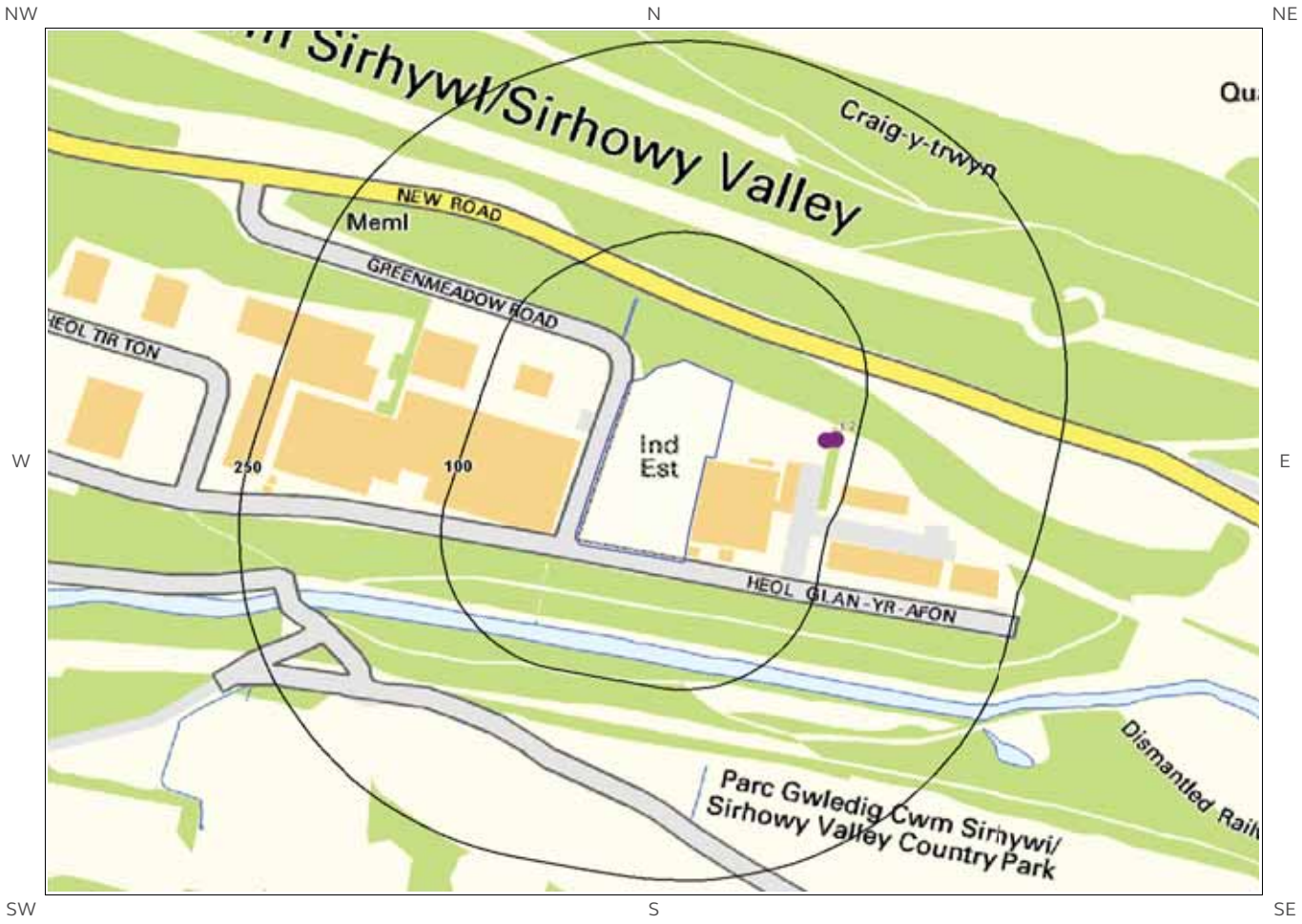
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.
3	24.0	N	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

5 Borehole Records Map



Borehole Records Legend

Mapping sourced from Ordnance Survey

Site Outline

Borehole Locations

125
250
Search Buffers (m)

5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	77.0	E	319361 191322	ST19SE8	360.58	NINE MILE POINT COLLIERY, EAST SHAFT
2	84.0	E	319368 191323	ST19SE9	360.43	NINE MILE POINT COLLIERY, WEST SHAFT

Additional online information is available for the following boreholes listed above:

#1: scans.bgs.ac.uk/sobi_scans/boreholes/381950
#2: scans.bgs.ac.uk/sobi_scans/boreholes/381951

6 Estimated Background Soil Chemistry

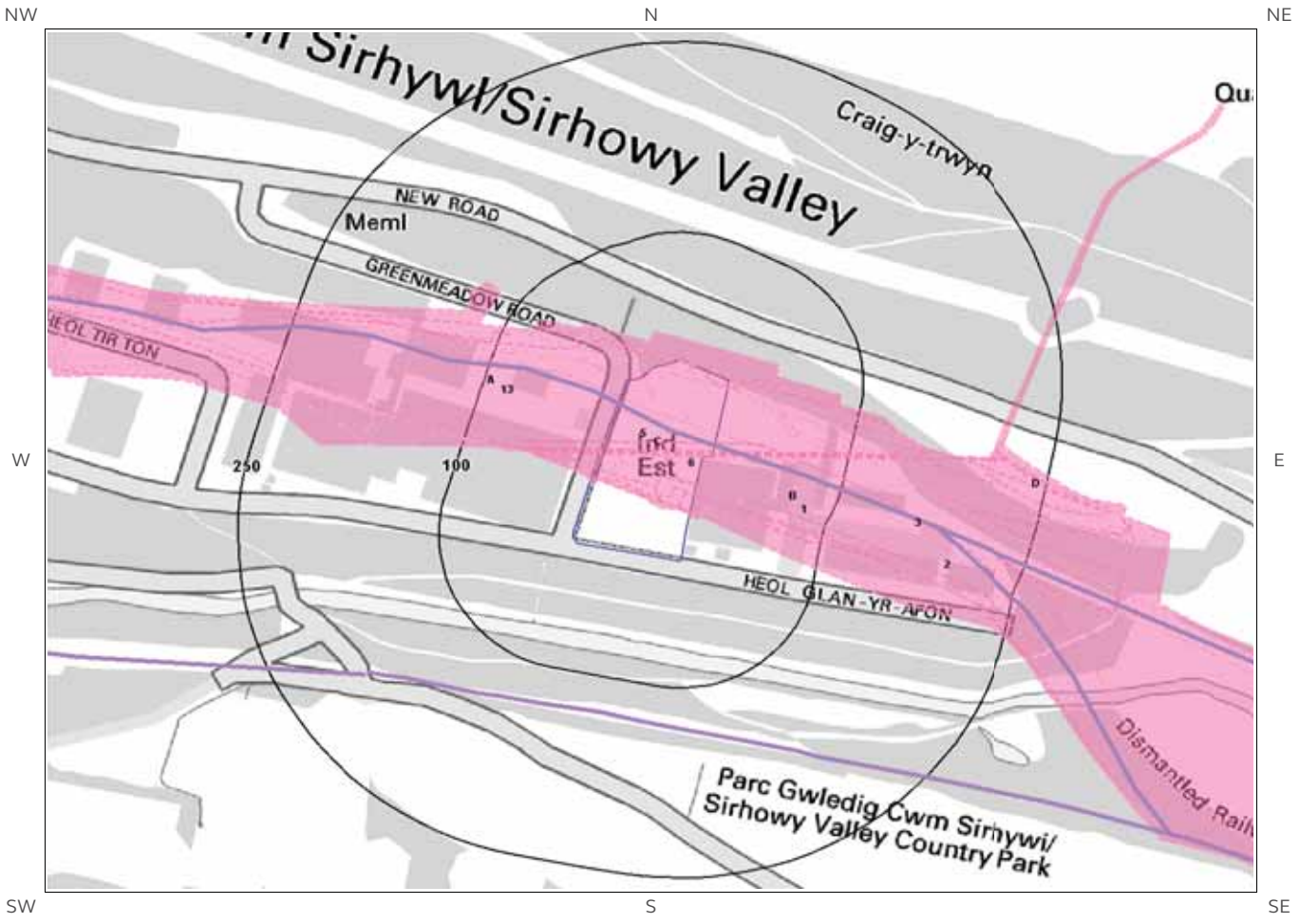
Records of background estimated soil chemistry within 250m of the study site boundary: 21

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geoinsight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
24.0	N	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
104.0	S	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
114.0	N	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
137.0	N	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
143.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
176.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
192.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
193.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
208.0	E	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
211.0	E	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
212.0	W	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
227.0	S	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
227.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
232.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
245.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
246.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
247.0	E	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

7 Railways and Tunnels Map



Railways and Tunnels Legend

Mapping sourced from Ordnance Survey

- Site Outline
- 250 / 500 Search Buffers (m)
- Underground or Partially Underground Railway / Subway System
- Railway Tunnel (OS Mapping)
- Abandoned or Dismantled Railway (OpenStreetMap)
- Railway Track (OS Mapping)
- Railway Track (OpenStreetMap)
- High Speed 2
- Crossrail
- Railway and/or Tunnel Feature from Historical Mapping

7 Railways and Tunnels

7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	0	On Site	319548 191182	Railway Sidings	1965
2	0	On Site	319430 191233	Railway Sidings	1948
3	0	On Site	319494 191232	Railway Sidings	1915
4B	0	On Site	319415 191248	Railway Sidings	1916
5	0	On Site	319192 191302	Railway Sidings	1922
6	0	On Site	319266 191298	Railway Sidings	1916

ID	Distance (m)	Direction	NGR	Details	Date
7A	0	On Site	319004 191378	Railway Sidings	1948
8A	0	On Site	319105 191382	Railway Sidings	1938
10C	0	On Site	319446 191226	Railway Sidings	1961
11B	0	On Site	319415 191248	Railway Sidings	1916
12C	0	On Site	319266 191298	Railway Sidings	1916
13	0	On Site	319071 191375	Railway Sidings	1920
9D	200	E	319528 191288	Railway Sidings	1916
14D	200	E	319528 191288	Railway Sidings	1916
15	205	E	319547 191446	Tramway Sidings	1920

Any records that have been identified are represented on the Railways and Tunnels Map.

7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? Yes

Have any historical railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Status
0	On Site	Abandoned
128	S	Abandoned
177	E	Abandoned
189	SW	Abandoned

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail.

Is the study site within 5km of the route of the High Speed 2 rail project?	No
Is the study site within 500m of the route of the Crossrail rail project?	No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail Report.

Contact Details

emapsite™

EmapSite

Telephone: 0118 9736883
sales@emapsite.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
Email: **enquiries@phe.gov.uk**
Main switchboard: 020 7654 8000

Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettel Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email:**enquiries.gs@jpb.co.uk**
Website: **www.jpb.co.uk**

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS

Tel: 08456 050505
Website: http://www.ordnancesurvey.co.uk/

Getmapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website:**http://www1.getmapping.com/**

Peter Brett Associates

Caversham Bridge House
Waterman Place
Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail:**reading@pba.co.uk**
Website:**http://www.peterbrett.com/home**

Contact Details

Standard Terms and Conditions

1 Definitions

I**n these terms and conditions unless the context otherwise requires:**
"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.
"Client" means the party or parties entering into a Contract with Groundsure.
"Commercial" means any building or property which is not Residential.
"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than
(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and
(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).
"Support Services" means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.
"Contract" means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.
"Third Party Data Provider" means any third party providing Third Party Content to Groundsure.
"Data Reports" means reports comprising factual data with no accompanying interpretation.
"Fees" has the meaning set out in clause 5.1.
"Groundsure" means Groundsure Limited, a company registered in England and Wales under number 03421028.
"Groundsure Materials" means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.
"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.
"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.
"Order" means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.
"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.
"Order Website" means the online platform through which Orders may be placed by the Client and accepted by Groundsure.
"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.
"Residential" means any building or property used as or intended to be used as a single dwelling.
"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.
"Services" means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.
"Site" means the area of land in respect of which the Client has requested Groundsure to provide the Services.
"Third Party Content" means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.
"User Guide" means the user guide, as amended from time to time, available upon request from Groundsure and on the website (www.Groundsure.com) and forming part of this Contract.

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

2.1 Groundsure agrees to provide the Services in accordance with the Contract.
2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.
2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.
2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.
2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.
2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1The Client shall comply with the terms of this Contract and
(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and
(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.
3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.
3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.
3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.
3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.
3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.
4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;
(i) the Beneficiary,
(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),
(iv) the first purchaser or first tenant of the Site, and
(v) the professional advisers and lenders of the first purchaser or tenant of the Site.
4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.
4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").
5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.
5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to
(i) full payment of all relevant Fees and
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.
6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure

acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.
6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.
6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

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

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

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.
6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

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

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

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.
7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.
7.4 Groundsure shall not be liable for

(i) loss of profits;
(ii) loss of business;
(iii) depletion of goodwill and/or similar losses;
(iv) loss of anticipated savings;
(v) loss of goods;
(vi) loss of contract;
(vii) loss of use;
(viii) loss or corruption of data or information;
(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.
7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

8 Groundsure's right to suspend or terminate

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

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.
9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event
(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

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

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.
12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.
12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.
12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.
12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

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

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

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

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

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

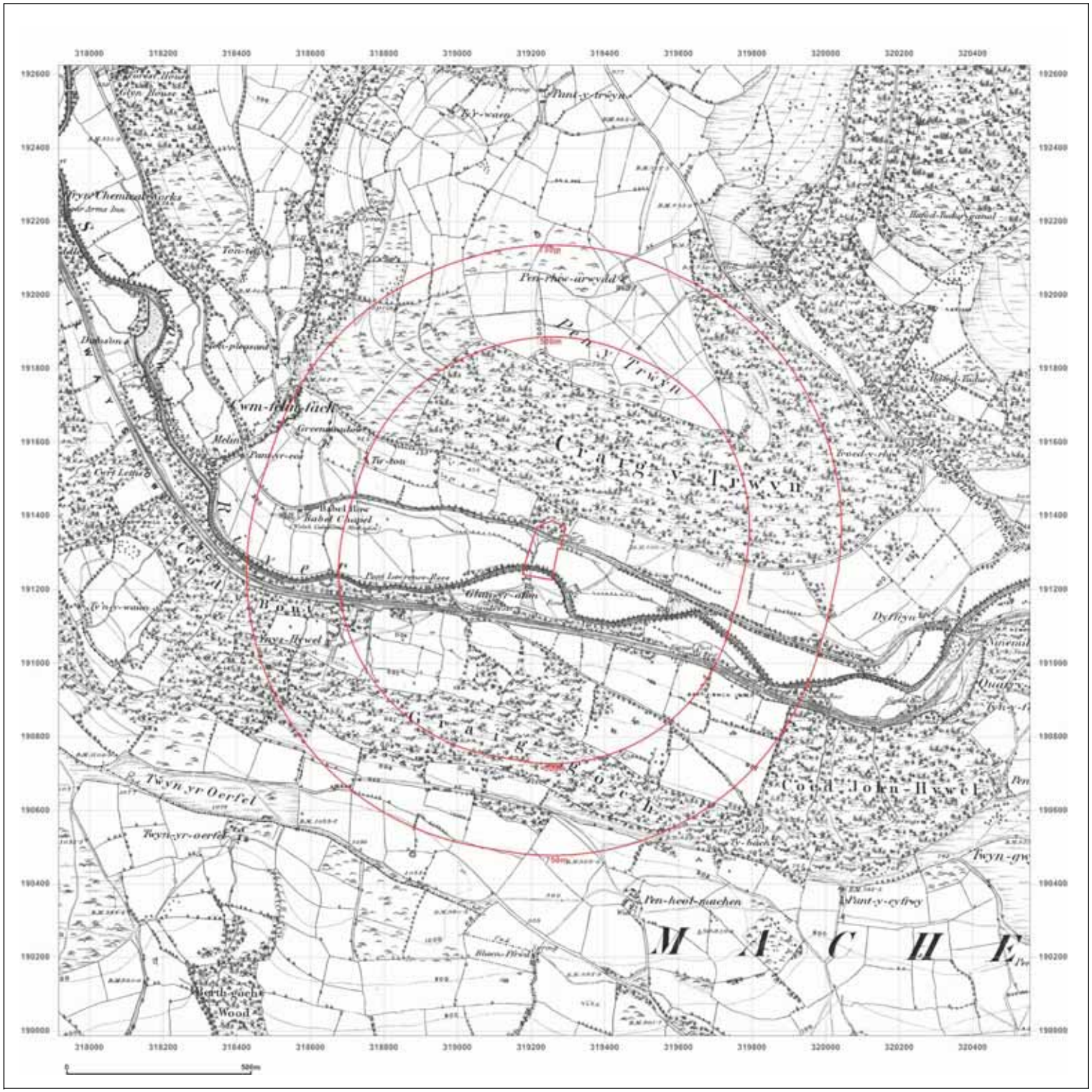
12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

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

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

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

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



emapsite™

Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1875**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

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www.groundsure.com

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Supplied by:
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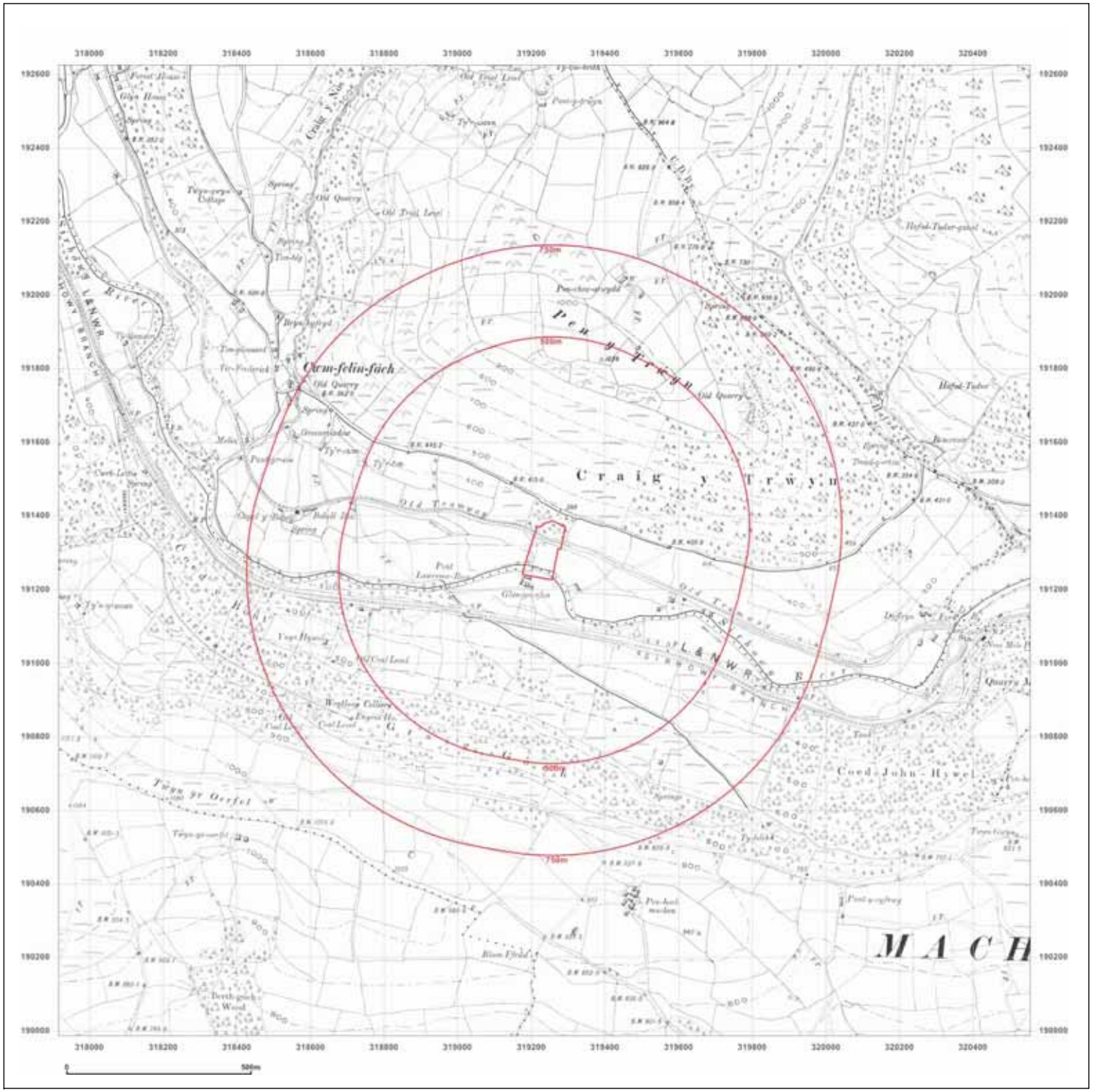
sales@emapsite.com

Production date: 20 April 2015

To view map legend click here *Legend*



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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1898-1899**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1877
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

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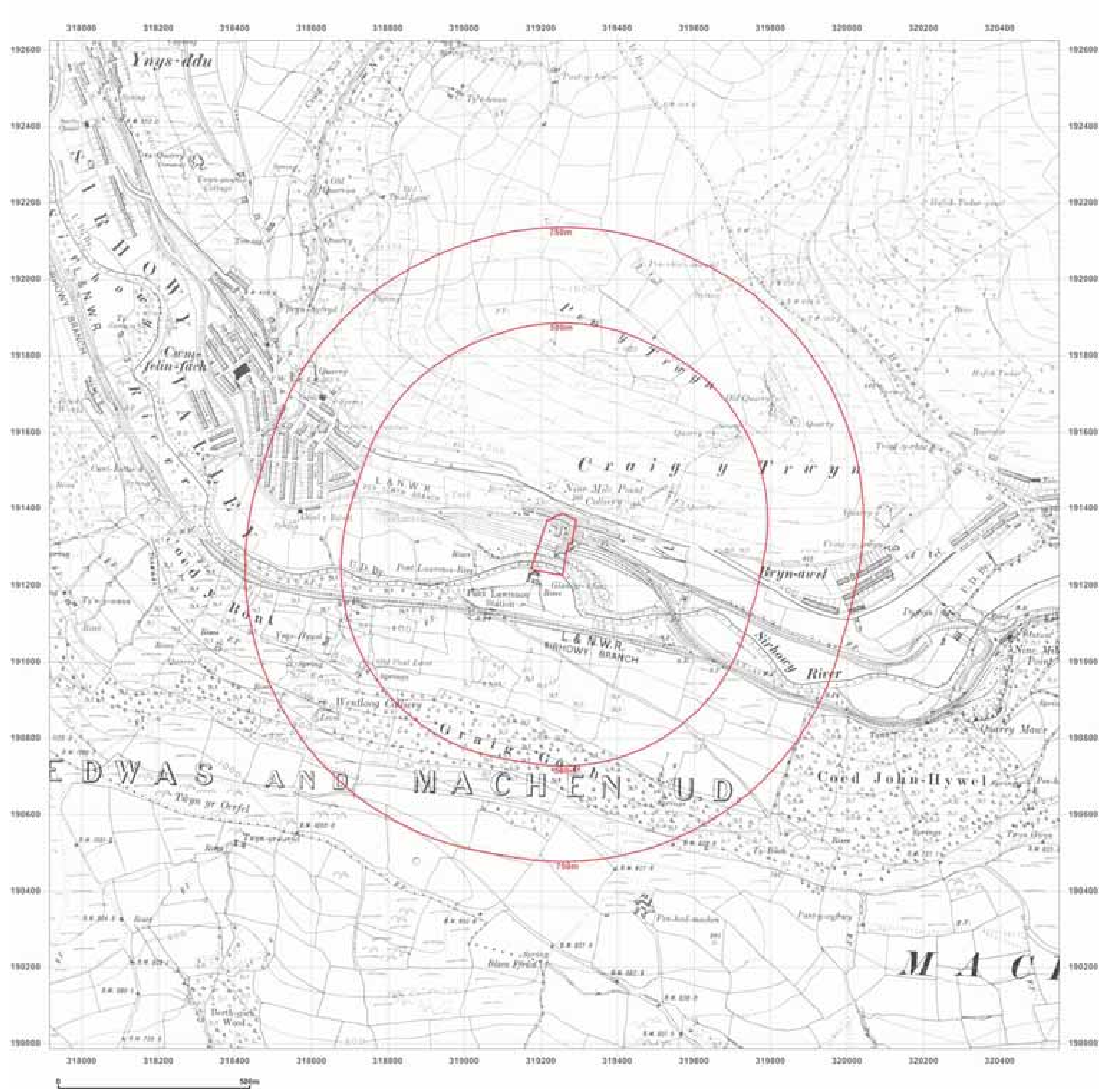

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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series

Map date: **1915-1916**

Scale: 1:10,560

Printed at: 1:10,560

Surveyed 1877
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A

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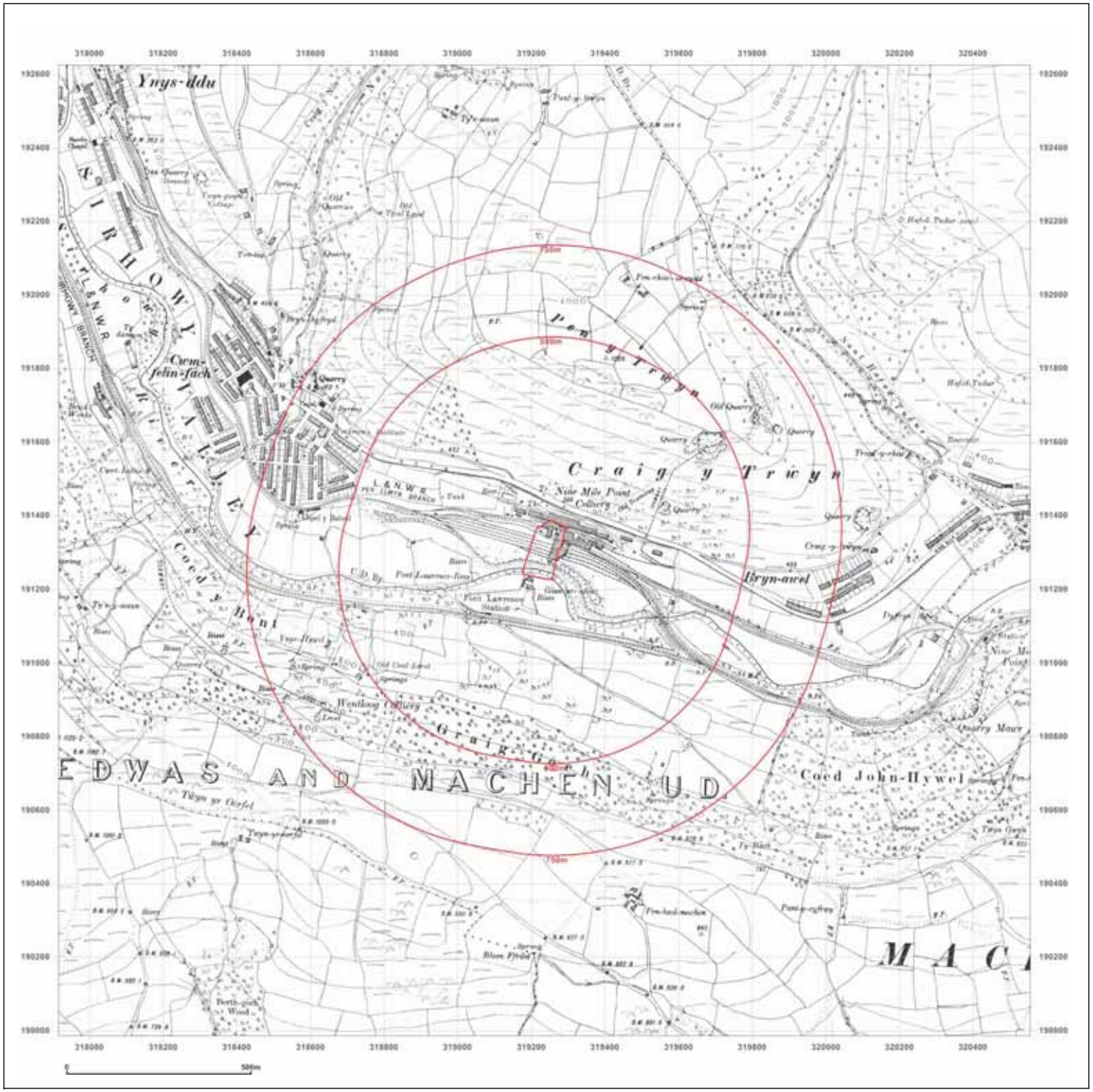

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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1922**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1874
Revised 1922
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 20 April 2015

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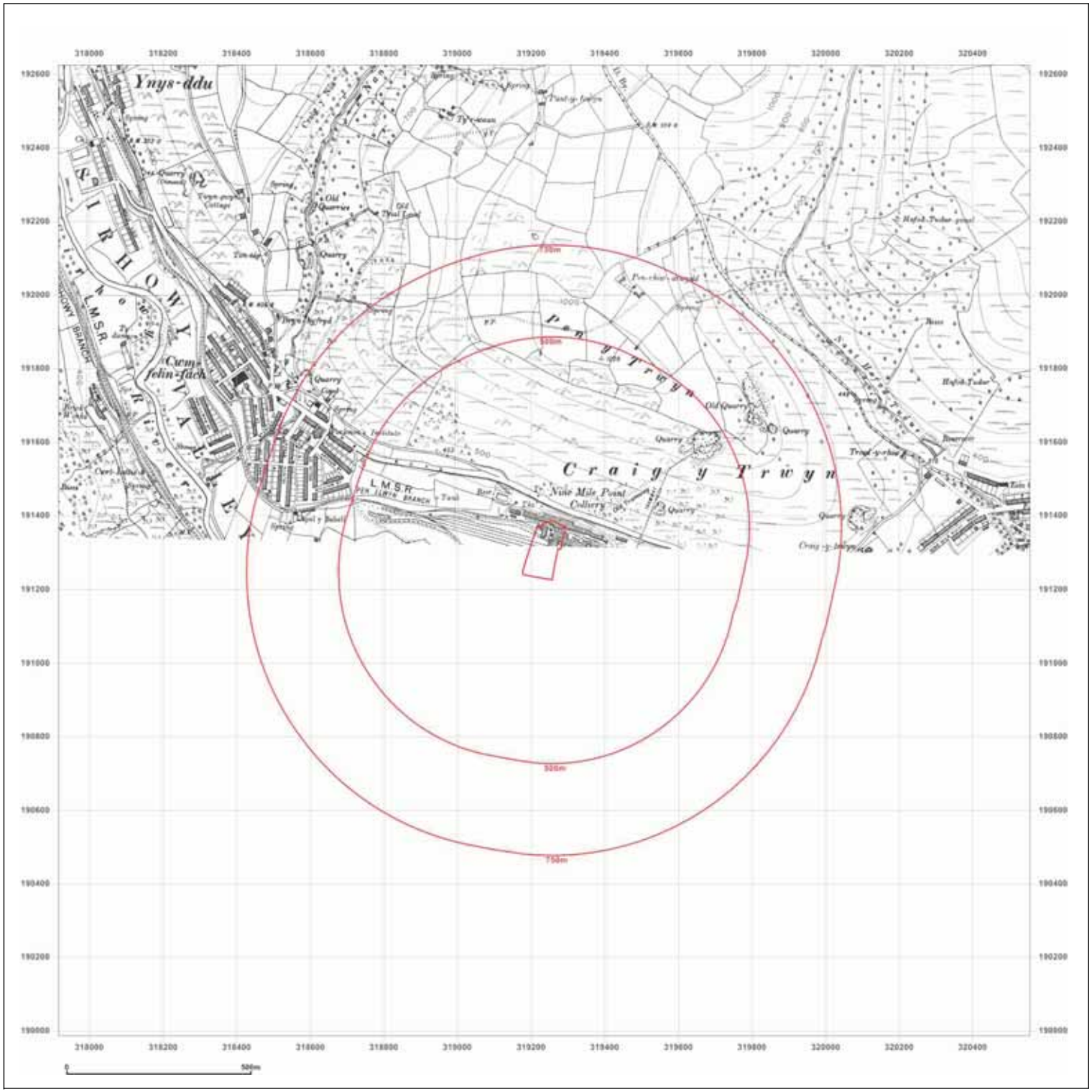

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Site Details:

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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1938**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1877
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

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Production date: 20 April 2015

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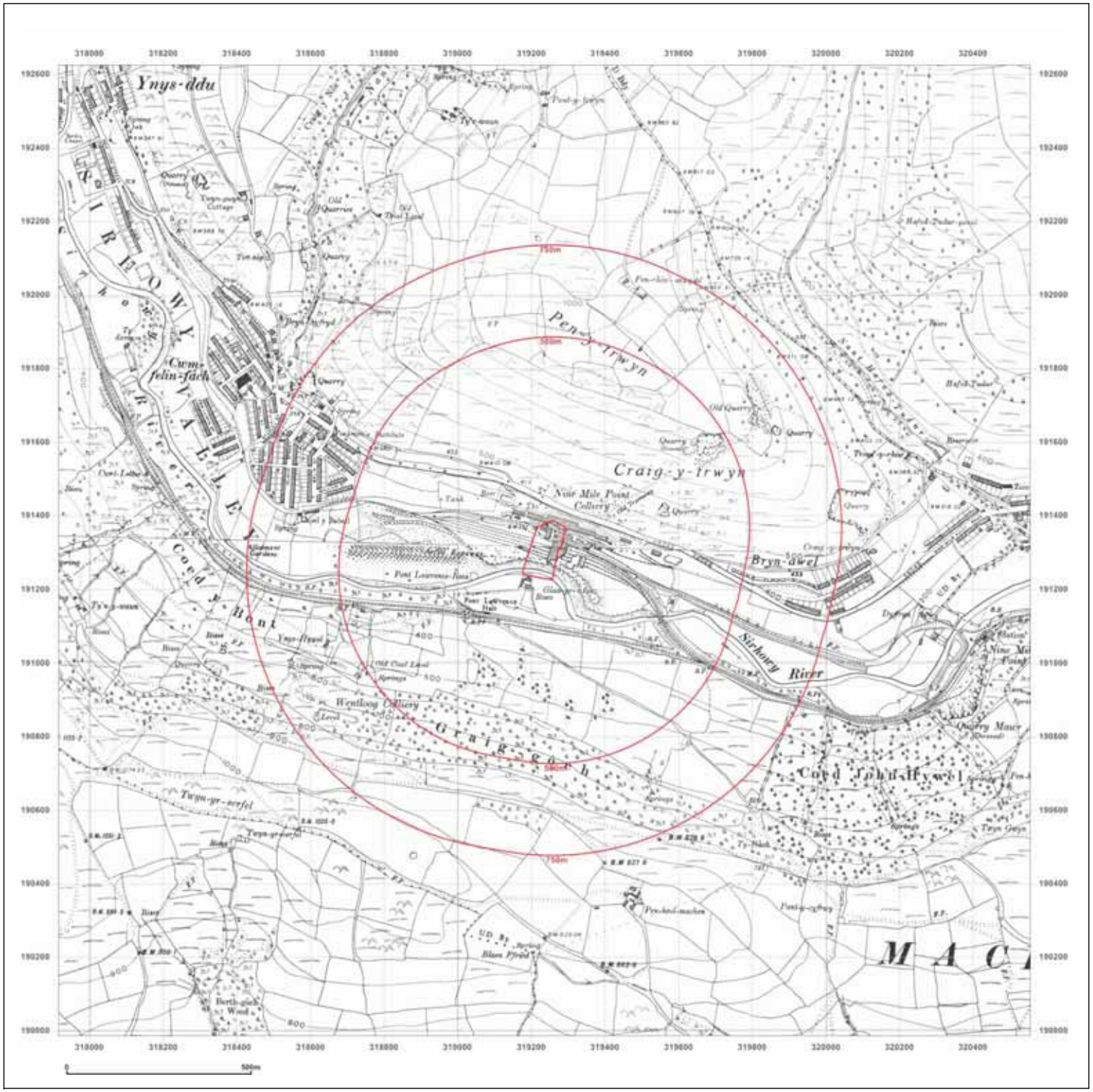

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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1948**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1877
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 20 April 2015

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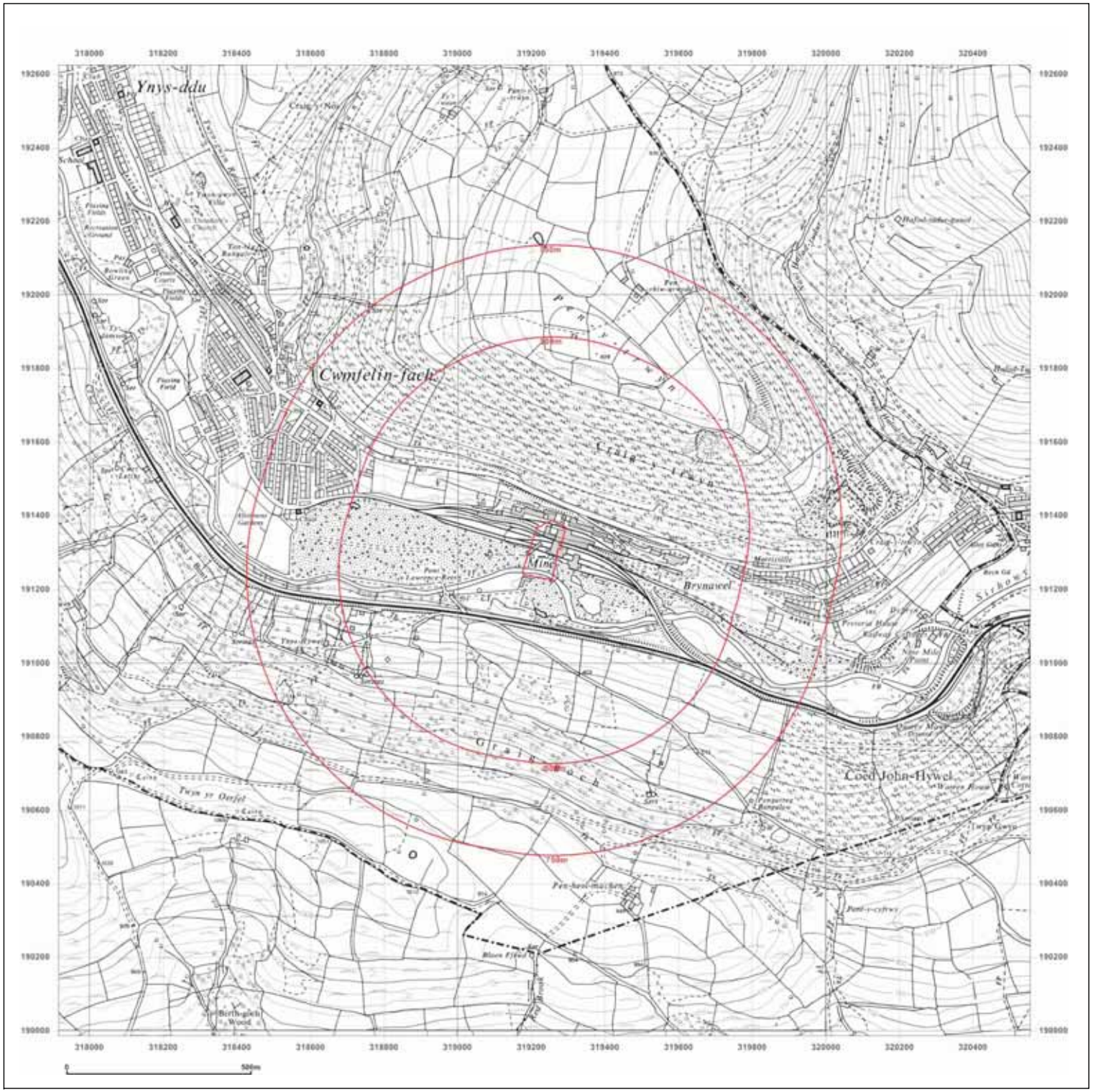

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Site Details:

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Grid Ref: 319235, 191305

Map Name: Provisional
Map date: **1960-1965**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised 1963
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised 1948
Edition N/A
Copyright 1960
Levelled N/A

Surveyed N/A
Revised 1963
Edition N/A
Copyright N/A
Levelled N/A

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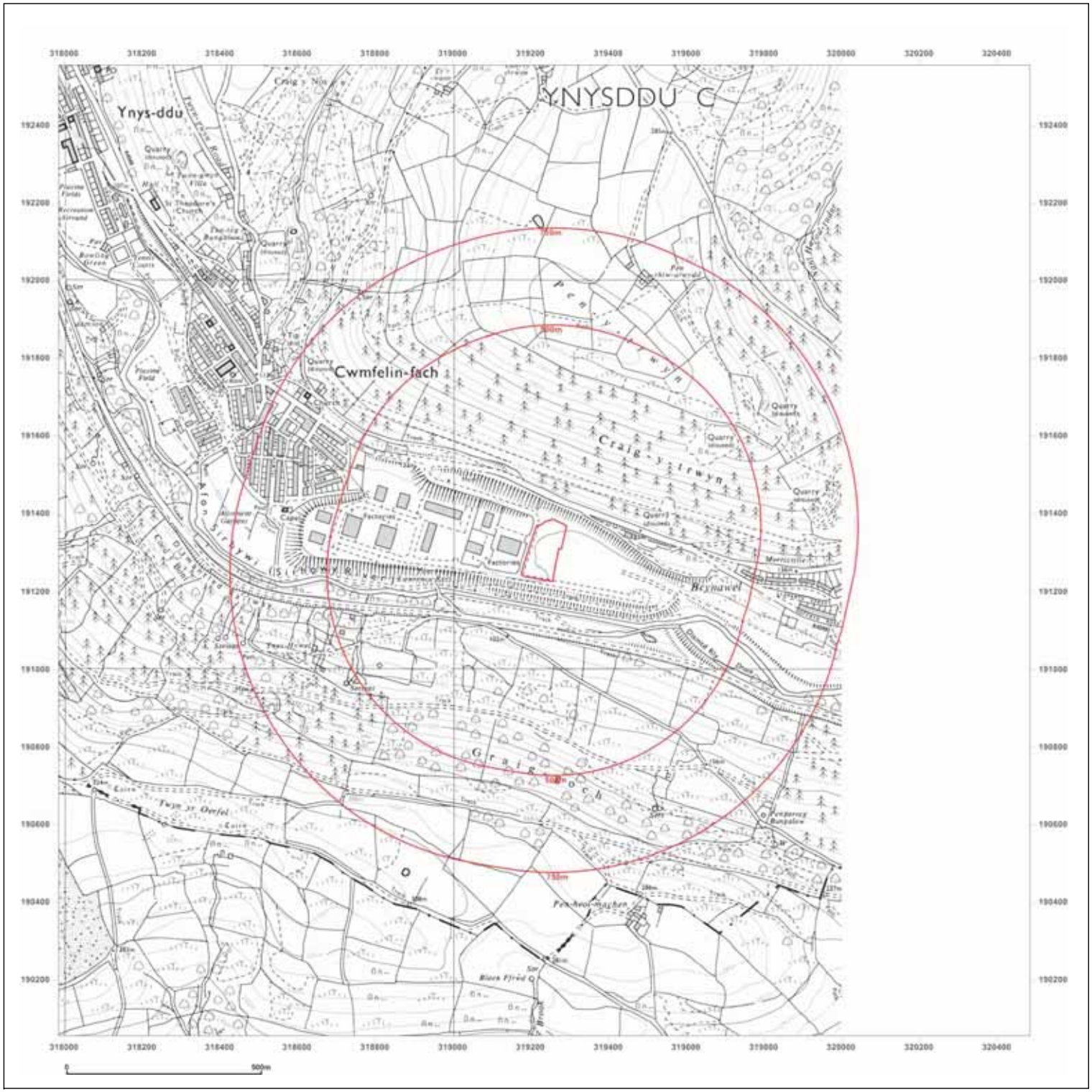
Production date: 20 April 2015

To view map legend click here *Legend*



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Site Details:

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Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: **1982**
Scale: 1:10,000
Printed at: 1:10,000

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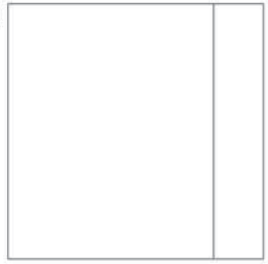
Surveyed 1978
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A



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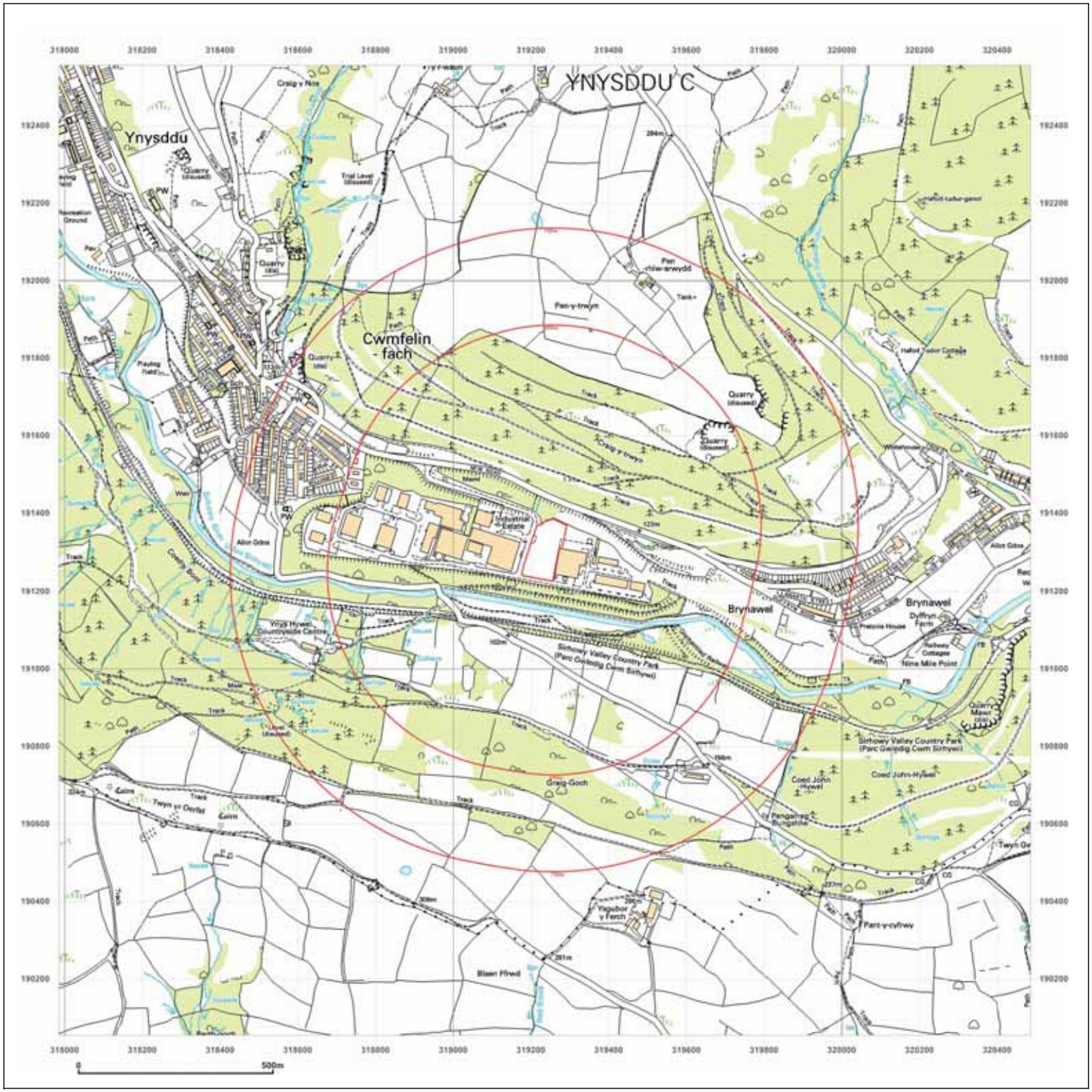

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: 1:10,000 Raster
Map date: **2002**
Scale: 1:10,000
Printed at: 1:10,000

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2002

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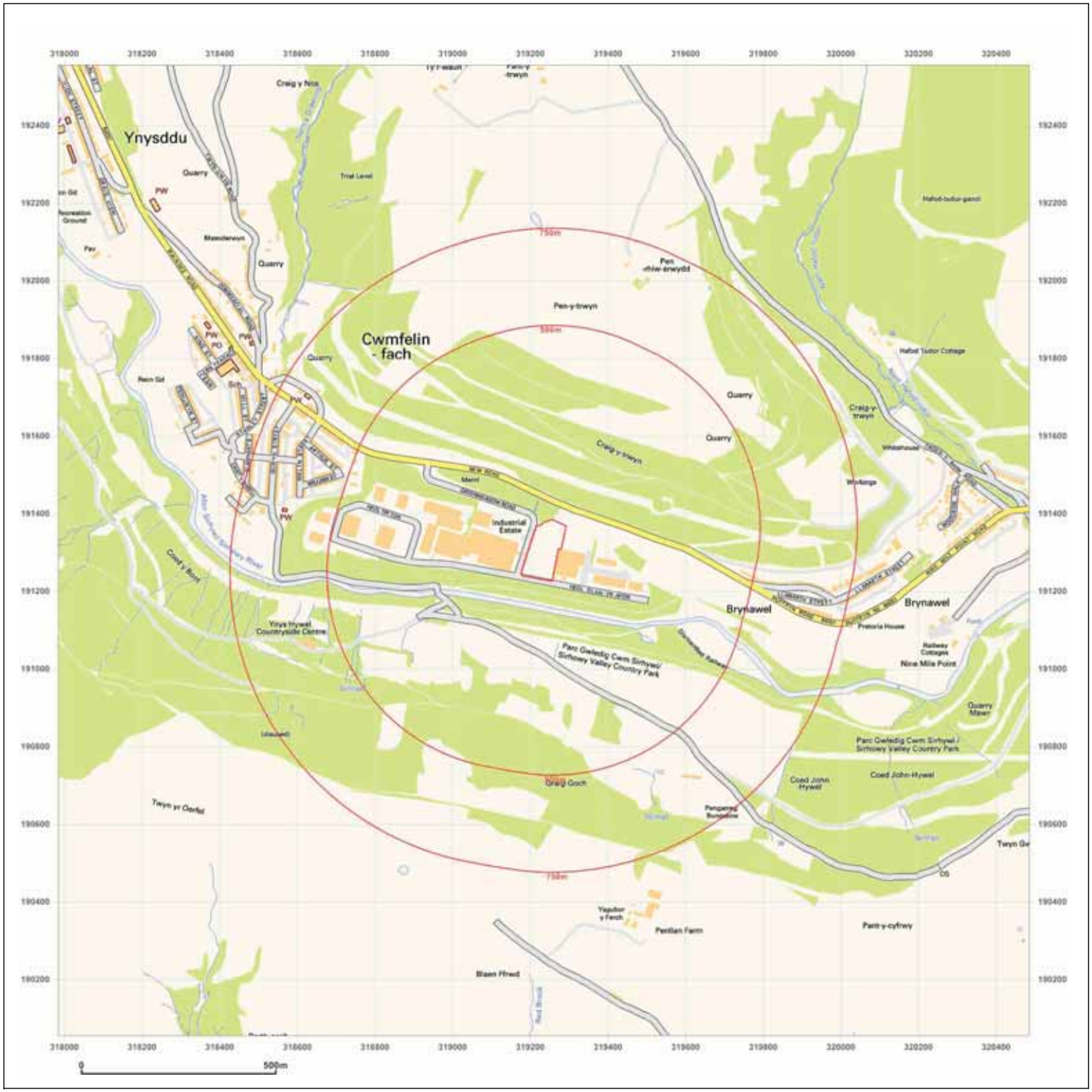

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: **2010**
Scale: 1:10,000
Printed at: 1:10,000

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2010

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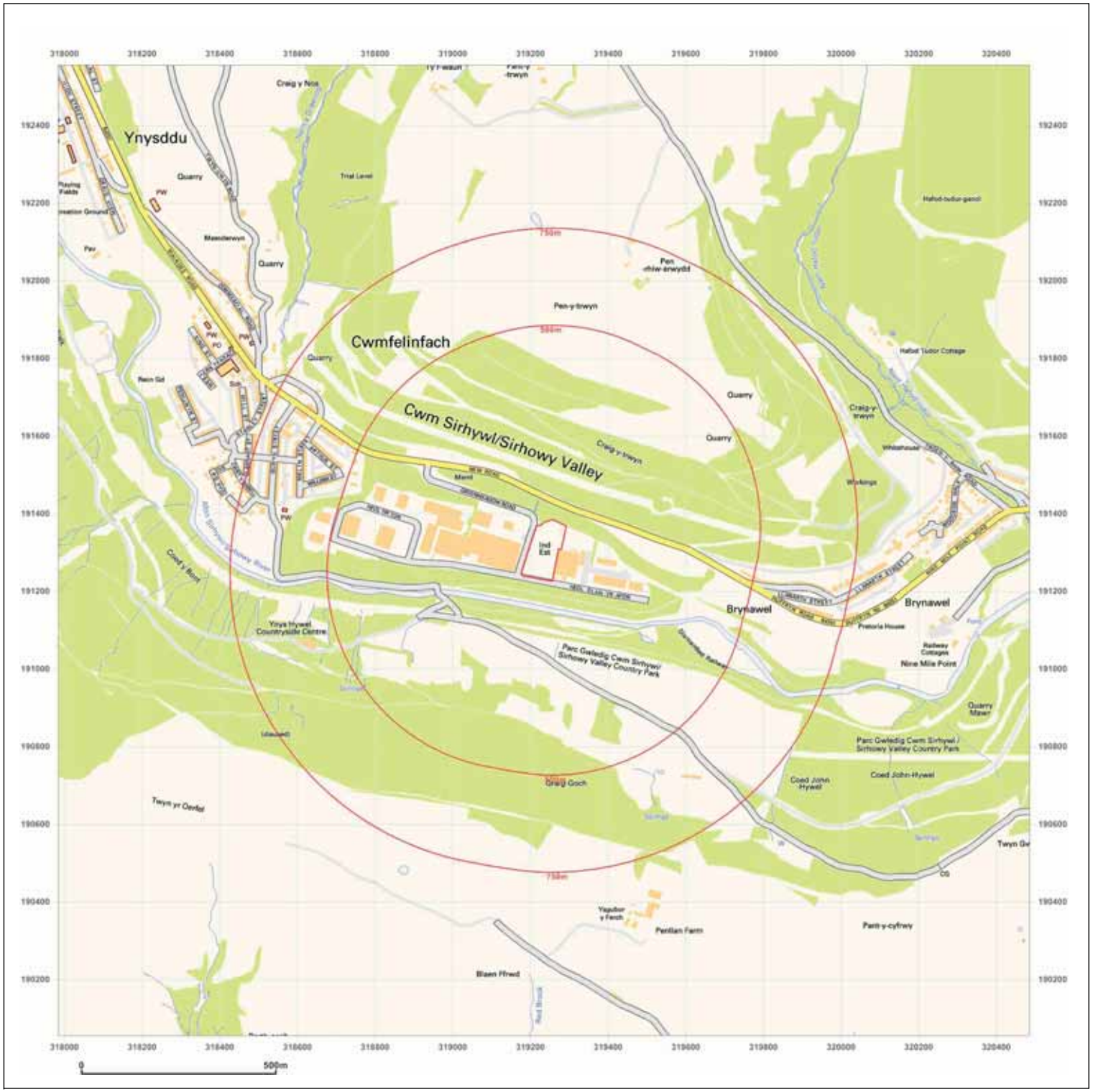

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: 2014
Scale: 1:10,000
Printed at: 1:10,000

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2014

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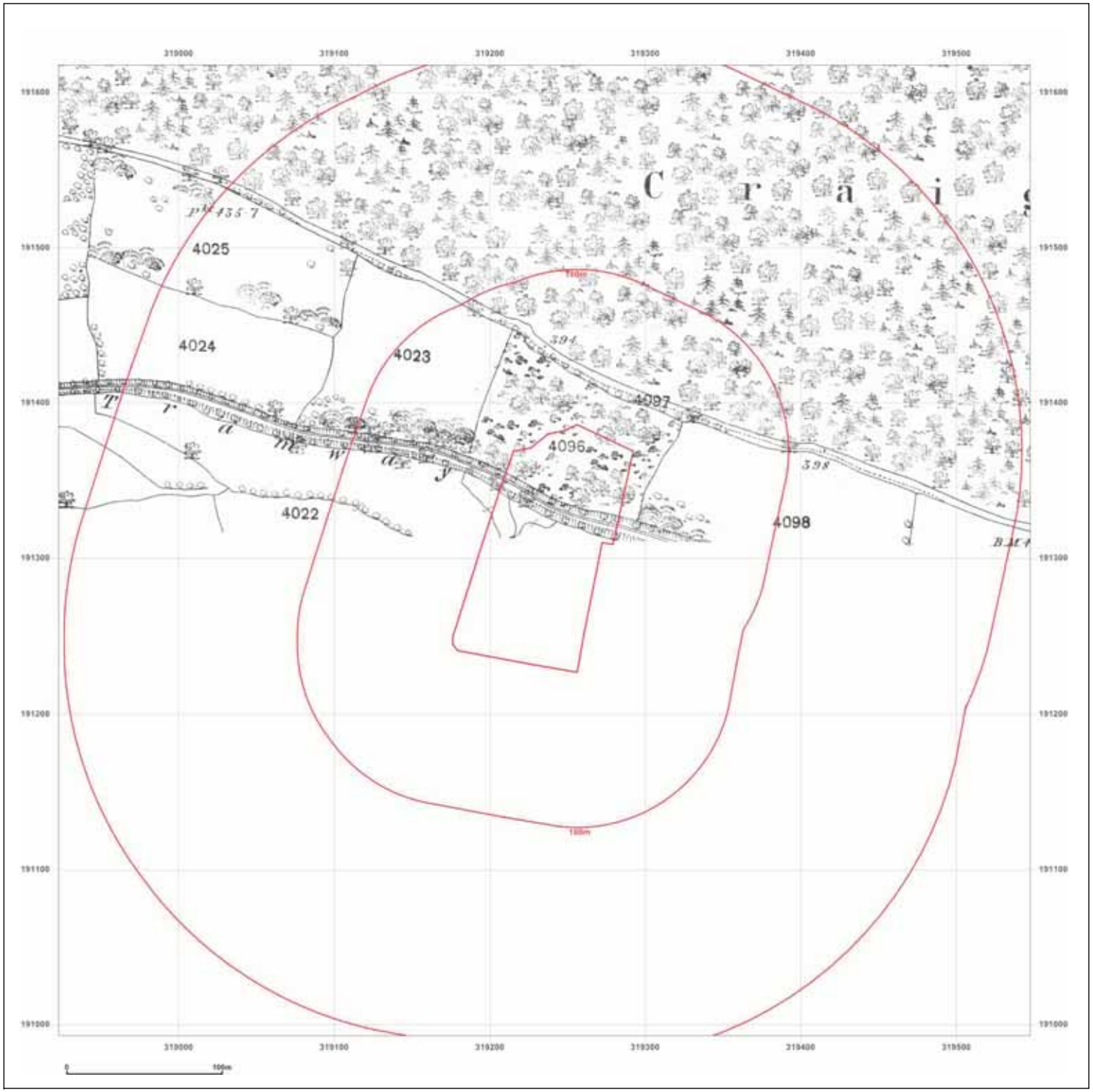

emapsite™

Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1879**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
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Production date: 20 April 2015

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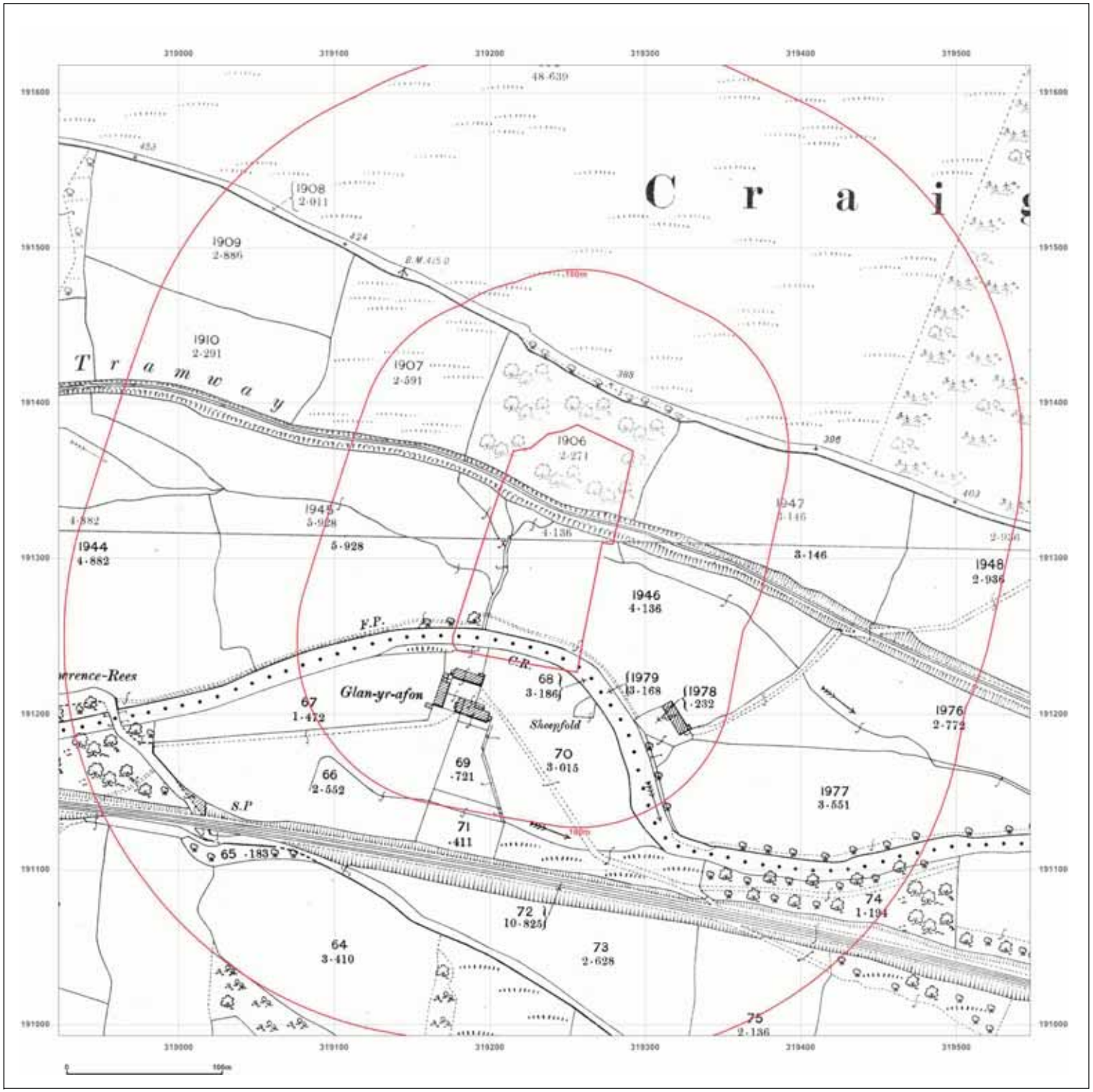

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: **1899-1901**
Scale: 1:2,500
Printed at: 1:2,500

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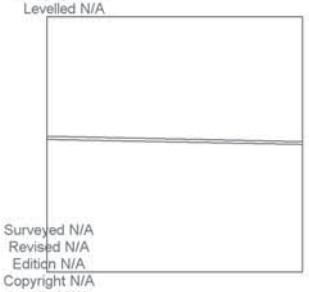
Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A



Surveyed N/A
Revised N/A
Edition N/A
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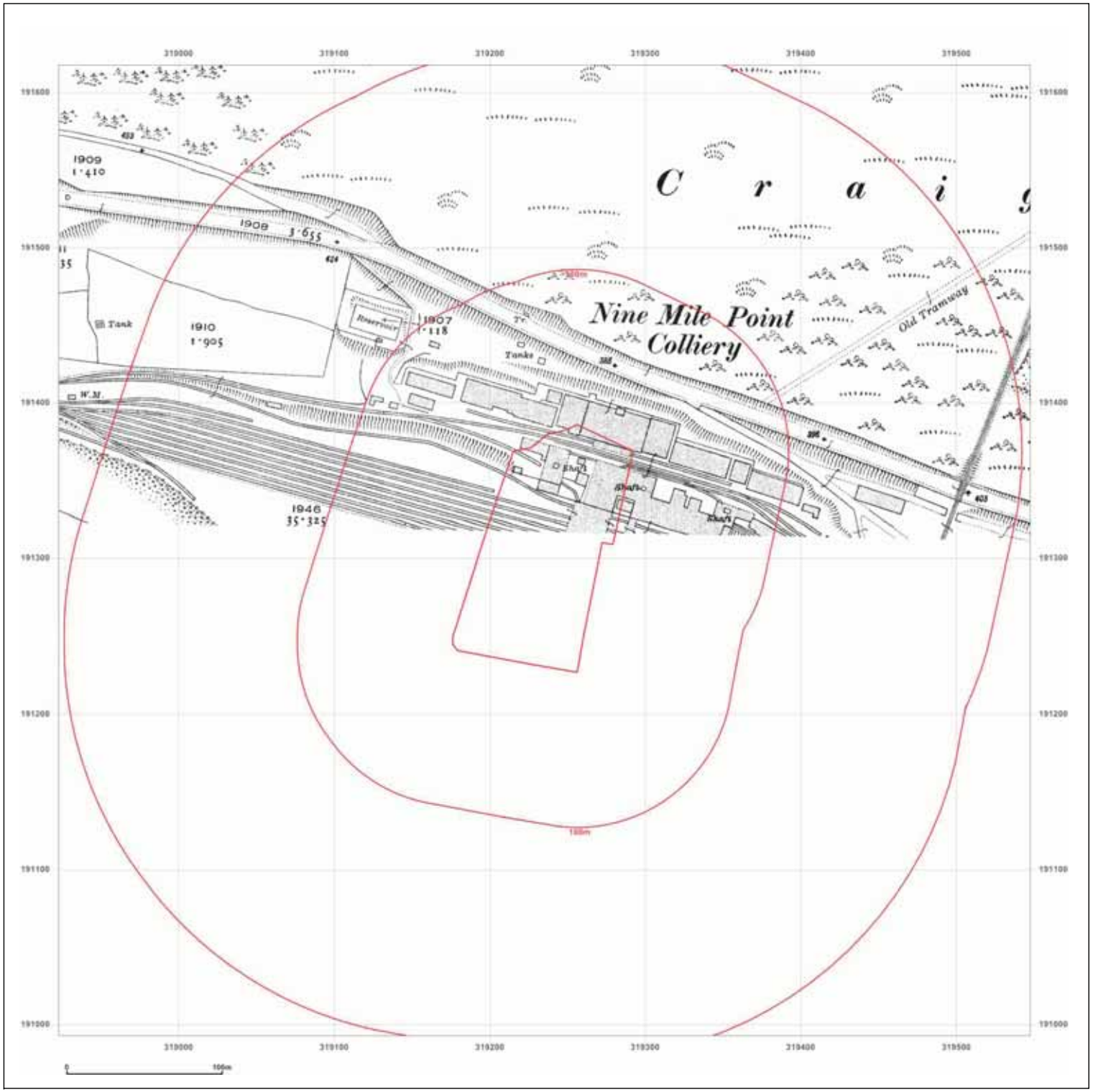

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: County Series
Map date: 1920
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
Levelled N/A

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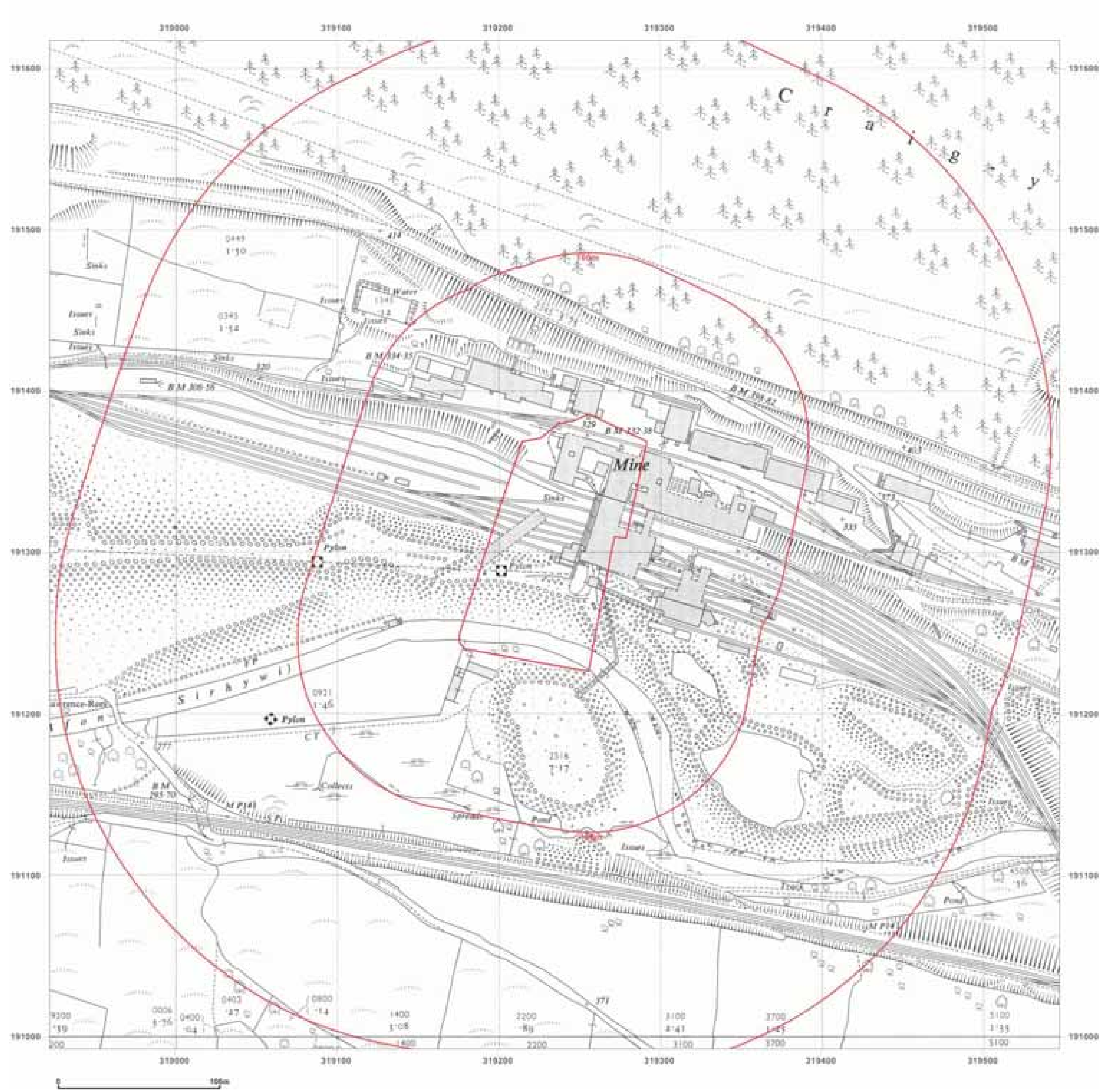

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid

Map date: **1960-1961**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1961
Revised 1961
Edition N/A
Copyright 1962
Levelled 1958

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1958

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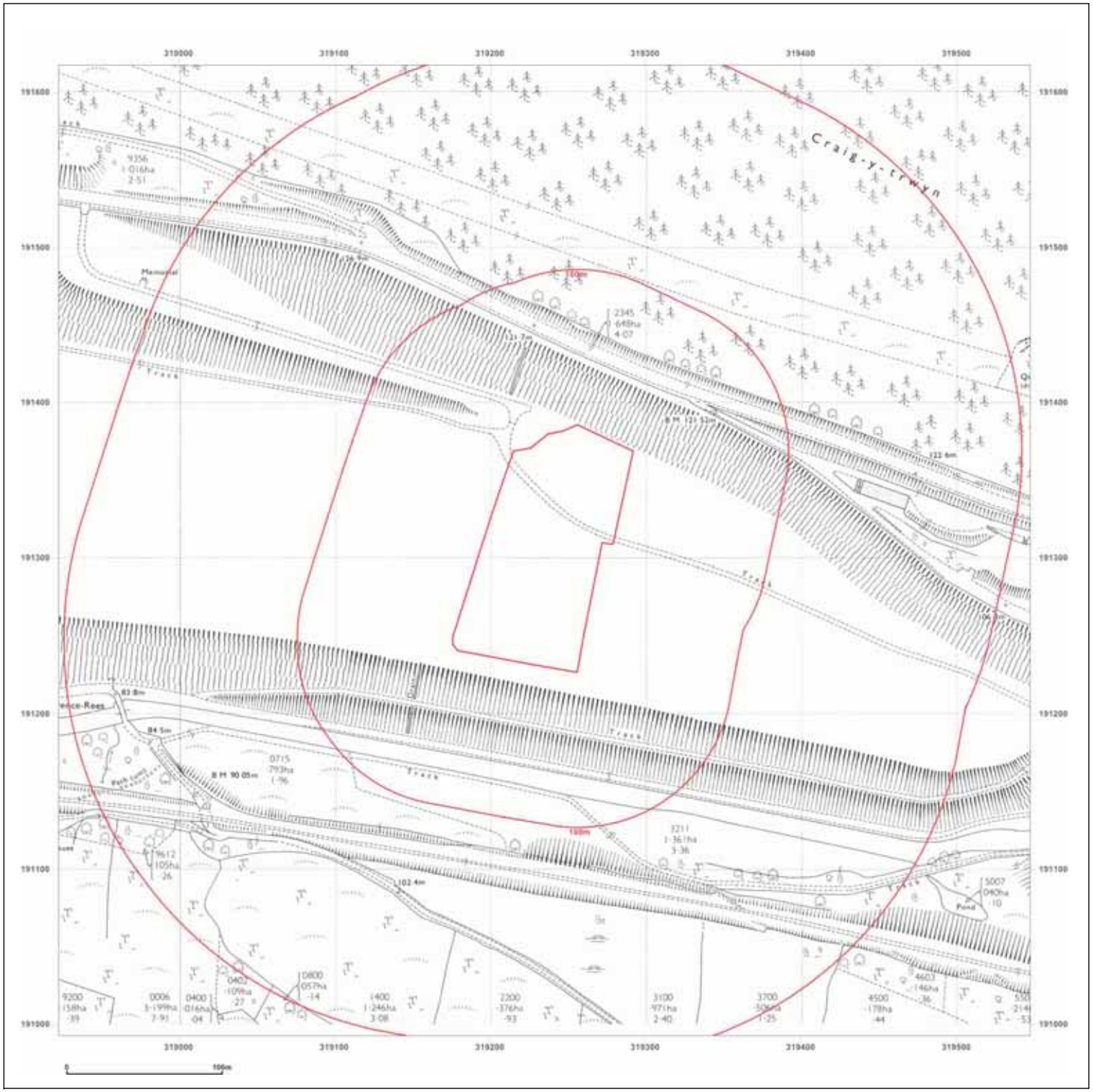

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: **1974**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1974
Revised 1974
Edition N/A
Copyright 1976
Levelled 1965

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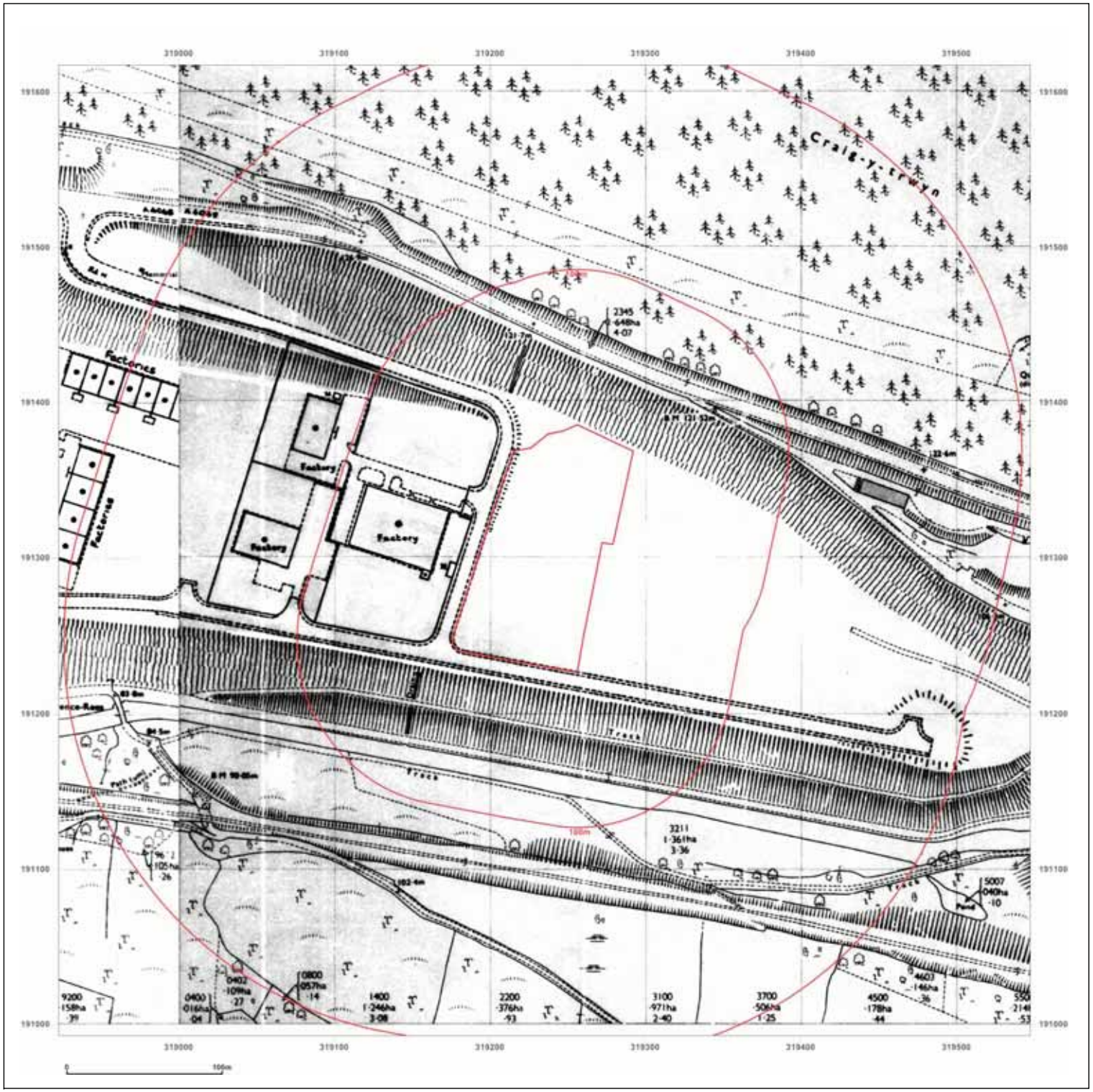

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: 1980-1982
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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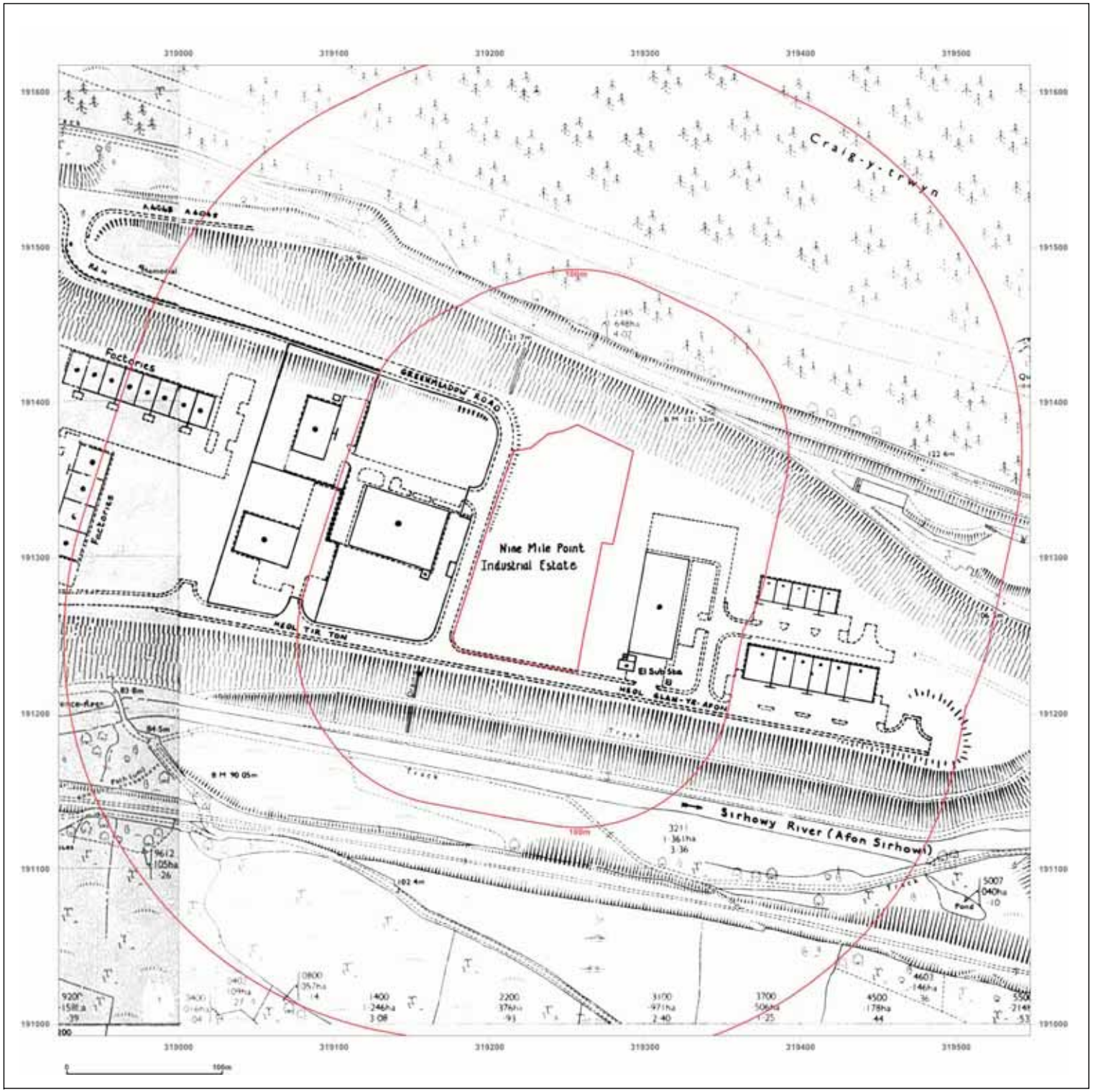

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: **1982-1988**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1955
Revised 1982
Edition N/A
Copyright 1982
Levelled 1955

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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Revised N/A
Edition N/A
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Levelled N/A

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Site Details:

Client Ref: EMS_299380_404631
Report Ref: EMS-299380_404631
Grid Ref: 319235, 191305

Map Name: National Grid
Map date: **1993**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1993
Revised 1993
Edition N/A
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Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 20 April 2015

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Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP1

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
	0.15	ES		0.25			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone and ash. Mine shaft cap encountered at 0.25mbgl (slab approximately 15.00mX15.00m).
				{4.00}			Trial Pit completed at 0.25m.

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x0.25
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical. Concrete mine cap encountered at 0.25mbgl.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M.W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP2

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to ,medium, angular to subangular sandstone.
	0.40	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles. Trial pit walls were partially collapsing.
	1.20	D					
▽							2.00 Frequent sandstone boulders.
				3.40			Trial Pit completed at 3.40m.
				{4.00}			

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x3.40
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides were collapsing preventing further advancement.
Groundwater was encountered at 2.40mbgl.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
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Enzygo Ltd
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Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP3

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 2

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
							Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.30	ES		0.40			
	0.50	D					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
				0.70			Light grey dark brown sandy gravel. Gravel is fine to coarse, angular to subangular brick, concrete, and sandstone cobbles.
	1.50	D					
				3.20			Light grey locally dark grey slightly sandy gravel with occasional ash staining. Gravel is fine to coarse, angular to subangular sandstone.
	3.50	D					
				3.85			
				{4.00}			Continued next sheet

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x5.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
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Site
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TP3

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
2 of 2

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
							Light grey locally dark grey slightly sandy clayey GRAVEL. Gravel is fine to coarse, rounded to subrounded sandstone.
	5.00	ES		5.00			Trial Pit completed at 5.00m.
				{8.00}			

4
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6
7
8

General Remarks

Dimensions: 3.00x0.60x5.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

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Site
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TP4

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
	0.15	ES		0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.70	D					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
	1.80	D					
				3.80			Trial Pit completed at 3.80m.
				{4.00}			

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
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Site
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TP5

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
							Light grey fine to coarse limestone, and limestone cobbles (probably imported quarry material). Trial pit wall were collapsing.
				1.90			Trial Pit completed at 1.90m.
				{4.00}			

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x1.90
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides were collapsing preventing further advancement.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
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Site
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TP6

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	1.10 1.30	ES D					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles
				3.80 {4.00}			Trial Pit completed at 3.80m.

0
1
2
3
4

General Remarks

Dimensions: 5.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
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Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP7

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.15			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.60	D					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
	0.90	ES					
	1.40	D					
	2.00	D					
				4.00 {4.00}			Trial Pit completed at 4.00m.

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x4.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

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Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP8

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 15-04-15 Finish 15-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone, and occasional rounded to subrounded cobbles of sandstone.
	0.30	D ES		0.40			Light grey brown sandy gravel. Gravel is fine to coarse, angular to subangular sandstone (probably quarry material).
							Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
				3.80			Trial Pit completed at 3.80m.
				{4.00}			

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

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Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP9

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
							Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone, and occasional rounded to subrounded cobbles of sandstone. 0.15 Band of fine ash, and fine to coarse angular to subangular sandstone.
	0.45	D		0.40			Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
	0.75	ES					
	2.80	D		2.70			Dark red light brown fine to cobbles SANDSTONE.
				4.00 {4.00}			Trial Pit completed at 4.00m.

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x4.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP10

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
	0.10	ES		0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	1.30	D					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and sandstone cobbles.
	2.30	D					
				3.80			Trial Pit completed at 3.80m.
				{4.00}			

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP11

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to ,medium, angular to subangular sandstone, and occasional cobbles of sandstone.
	0.80	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
	1.20	D					
	2.90	D					
				3.90 {4.00}			Trial Pit completed at 3.90m.

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x3.90
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP12

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.15			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.35	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
	0.90	ES					
	1.35	D					
	4.00	D		4.00 {4.00}			Trial Pit completed at 4.00m.

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x4.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP13

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.15			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.70	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
	1.20	D					
				4.00 {4.00}			Trial Pit completed at 4.00m.

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x4.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP14

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
							Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone, and occasional cobbles of sandstone.
				0.30			Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
	1.30	D					
				3.80			Trial Pit completed at 3.80m.
				{4.00}			

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP15

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	1.00	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
	1.50	D					
	3.80	D		3.80			Trial Pit completed at 3.80m.
				{4.00}			

0
1
2
3
4

General Remarks

Dimensions: 3.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP16

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
				0.40			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone, and occasional cobbles of sandstone.
	1.00	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular ash, brick, coal slag, concrete, and cobbles of sandstone.
							2.40 - 3.40 Several wooden mine props (1.50mX0.20m) encountered.
	3.10	D					
				4.00 {4.00}			Trial Pit completed at 4.00m.

0 1 2 3 4

General Remarks

Dimensions: 3.00x0.60x4.00
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Nine Mile Industrial Estate, Newport, Gwent NP11 7HZ

TP17

Job No	Dates	Ground Level (m)	Co-Ordinates
CRM.414.002	Start 16-04-15 Finish 16-04-15		

Client
Hazrem Environmental Ltd.

Sheet
1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
	Depth (m)	No/Type	Results				
	0.10	ES		0.20			Grass over (soft) black occasionally slightly gravelly sandy clay with frequent rootlets. Gravel is fine to medium, angular to subangular sandstone.
	0.60	ES					Black locally dark brown sandy gravel with frequent tiles, occasional wood (mine support props) and metal fragments. Gravel is fine to coarse, angular to subangular brick, coal slag, concrete, and cobbles of sandstone.
	1.00	D					
	1.80	D					
							2.70 Several wooden mine props (1.50mX0.20m) encountered.
				3.80			Trial Pit completed at 3.80m.
				{4.00}			

0 1 2 3 4

General Remarks

Dimensions: 5.00x0.60x3.80
Trial pit excavated by JCB 3CX Excavator.
Trial pit sides remained stable and vertical.
Groundwater was not encountered.
On completion, the trial pit was backfilled with material arisings.

All dimensions in metres
Scale 1:25

Logged By
M. W-D

enzygo

Site..... Nine Mile Point
Job Number..... CRM.414.002
Date of Test..... 14.05.15

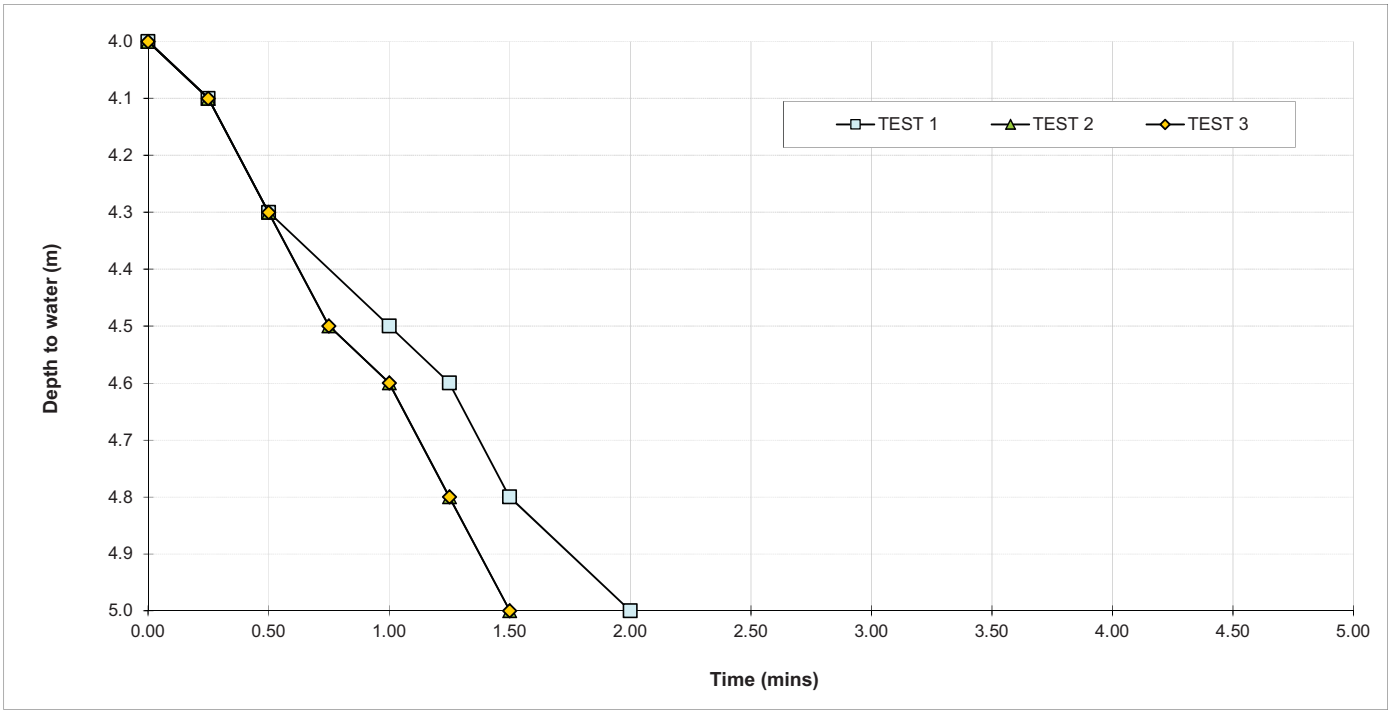
SOIL INFILTRATION RATE TEST
See B.R.E. Digest 365, 1991, Soakaway Design.

Soakaway Number.....	TP3	
Length.....	1.18	m
Width.....	0.60	m
Depth.....	5.00	m
Groundwater Level.....	Dry	m

Remarks -	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
0-3.85m: Made Ground Colliery Waste	0.0	4.00	0.0	4.00	0.0	4.00
3.85-5.00m: sandy gravel	0.3	4.10	0.3	4.10	0.3	4.10
	0.5	4.30	0.5	4.30	0.5	4.30
	1.0	4.50	0.8	4.50	0.8	4.50
	1.3	4.60	1.0	4.60	1.0	4.60
	1.5	4.80	1.3	4.80	1.3	4.80
	2.0	5.00	1.5	5.00	1.5	5.00

Effective Storage Depth	m	1.00	1.00	1.00
75% Effective Storage Depth	m	0.75	0.75	0.75
(i.e. depth below GL)	m	**4.25**	**4.25**	**4.25**
25% Effective Storage Depth	m	0.25	0.25	0.25
(i.e. depth below GL)	m	**4.75**	**4.75**	**4.75**
Effective Storage Depth 75%-25%	m	0.50	0.50	0.50
Time to fall to 75% effective depth	mins	0.25	0.25	0.25
Time to fall to 25% effective depth	mins	1.50	1.25	1.25
V (75%-25%)	m3	0.35	0.35	0.35
a (50%)	m2	2.49	2.49	2.49
t (75%-25%)	mins	1.25	1.00	1.00
SOIL INFILTRATION RATE	m/s	**1.90E-03**	**2.37E-03**	**2.37E-03**

DESIGN SOIL INFILTRATION RATE, f **1.90E-03** **m/s**



Compiled By:	Date:	Checked By:	Date:	Approved By:	Date:
M. Ward	14.05.15	R.Hamilton	14.05.15	S.Rhodes	14.05.15

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618
Facsimile: (01424) 729911
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-01696
Issue:	1
Date of Issue:	08/05/2015
Contact:	Richard Hamilton
Customer Details:	Enzygo - Cromhall The Granary Woodend Lane Cromhall Gloucestershire
Quotation No:	Q14-00007
Order No:	CRM1276
Customer Reference:	CRM.414.002
Date Received:	21/04/2015
Date Approved:	08/05/2015
Details:	Nine Mile Point Industrial Estate / CRM.414.002
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 15-01696

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
25096	TP01 0.15	15/04/2015	24/04/2015		
25097	TP02 0.40	15/04/2015	24/04/2015		
25098	TP02 1.20	15/04/2015	24/04/2015		
25099	TP03 0.30	15/04/2015	24/04/2015		
25100	TP03 0.50	15/04/2015	24/04/2015		
25101	TP03 1.50	15/04/2015	24/04/2015		
25102	TP03 3.50	15/04/2015	24/04/2015		
25103	TP03 5.00	15/04/2015	24/04/2015		
25104	TP04 0.15	15/04/2015	24/04/2015		
25105	TP06 1.10	15/04/2015	24/04/2015		
25106	TP07 0.60	15/04/2015	24/04/2015		
25107	TP07 0.90	15/04/2015	24/04/2015		
25108	TP08 0.30	16/04/2015	24/04/2015	Sandy silty loam	g
25109	TP09 0.75	16/04/2015	24/04/2015	Silty loam	g
25110	TP10 0.10	16/04/2015	24/04/2015		
25111	TP11 0.80	16/04/2015	24/04/2015		
25112	TP11 2.90	16/04/2015	24/04/2015		
25113	TP12 0.35	16/04/2015	24/04/2015		
25114	TP12 0.90	16/04/2015	24/04/2015		
25115	TP13 0.70	15/04/2015	24/04/2015		
25116	TP14 0.10	15/04/2015	24/04/2015		
25117	TP15 1.00	16/04/2015	24/04/2015		
25118	TP15 1.50	16/04/2015	24/04/2015		
25119	TP16 1.00	16/04/2015	24/04/2015		
25120	TP17 0.10	15/04/2015	24/04/2015		
25121	TP17 0.60	15/04/2015	24/04/2015		
25122	1@0.15, TP3@0.30, TP4@0	15/04/2015	24/04/2015	Silty loam	g
25123	ned TP10, TP14, TP17@0.1	15/04/2015	24/04/2015	Silty loam	g
25124	2@0.40@1.20, TP3@0.50@1	15/04/2015	24/04/2015	Sandy silty loam	g
25125	6@1.10, TP7@0.60, TP7@0	15/04/2015	24/04/2015	Silty loam	g
25126	0 TP11@0.80@2.90, TP12@	15/04/2015	24/04/2015	Silty loam	g
25127	0.60 TP15@1.00@1.50, TP1	15/04/2015	24/04/2015	Silty loam	g

Results Summary

Report No.: 15-01696

			ELAB Reference	25108	25109	25122
			Customer Reference			TP1@0.15, TP3@0.30, TP4@0.15
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP08	TP09	Combined
			Sample Depth (m)	0.30	0.75	0.15 - 0.30
			Sampling Date	16/04/2015	16/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic	M	mg/kg	1	22.9	16.5	17.4
Cadmium	M	mg/kg	0.5	7.4	< 0.5	< 0.5
Chromium	M	mg/kg	5	9.0	6.7	22.8
Copper	M	mg/kg	5	26.7	40.9	27.3
Lead	M	mg/kg	5	296	27.0	38.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	7.9	22.3	24.6
Selenium	M	mg/kg	1	< 1.0	1.9	1.4
Zinc	M	mg/kg	45	398	61.7	100
Anions						
Water Soluble Sulphate	M	g/l	0.02	< 0.02	n/t	< 0.02
Inorganics						
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Miscellaneous						
Moisture Content	N	%	0.1	6.1	11.2	37.2
pH	M	units	0.1	8.2	8.0	6.9
Stones Content	N	%	0.1	46.0	31.3	9.7
Total Organic Carbon	N	%	0.01	0.98	8.9	4.2

Results Summary

Report No.: 15-01696

		ELAB Reference	25108	25109	25122
		Customer Reference			TP1@0.15, TP3@0.30, TP4@0.15
		Sample ID			
		Sample Type	SOIL	SOIL	SOIL
		Sample Location	TP08	TP09	Combined
		Sample Depth (m)	0.30	0.75	0.15 - 0.30
		Sampling Date	16/04/2015	16/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**		
Organics					
>C8-C10 BCB	N	mg/kg	1	g < 1.0	g < 1.0	g < 1.0
>C10-C12 BCB	N	mg/kg	1	g < 1.0	g < 1.0	g < 1.0
>C12-C16 BCB	N	mg/kg	1	g < 1.0	g < 1.0	g < 1.0
>C16-C21 BCB	N	mg/kg	1	g < 1.0	g < 1.0	g < 1.0
>C21-C35 BCB	N	mg/kg	1	g 6.0	g < 1.0	g < 1.0
>C35-C40 BCB	N	mg/kg	1	g 2.5	g < 1.0	g < 1.0
Total (>C8-C40) BCB	N	mg/kg	1	g 8.5	g < 1.0	g < 1.0
Phenols					
Phenol	M	mg/kg	1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	0.5	0.6
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	1.3
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	0.9
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	0.8
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	1.1
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	1.3
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	0.8
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	0.6	0.7
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	0.7	0.5
Total PAH(16)	M	mg/kg	2	< 2	3	9

Results Summary

Report No.: 15-01696

			ELAB Reference	25123	25124
			Customer Reference	TP10, TP14, TP17@0.10	TP2@0.40@1.20, TP3@0.50@1.50
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	Combined	Combined
			Sample Depth (m)	0.10	0.40 - 1.50
			Sampling Date	15/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	19.2	11.1
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	44.9	11.5
Copper	M	mg/kg	5	36.2	33.7
Lead	M	mg/kg	5	61.3	20.7
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	36.4	30.1
Selenium	M	mg/kg	1	1.8	1.3
Zinc	M	mg/kg	45	149	69.7
Anions					
Water Soluble Sulphate	M	g/l	0.02	n/t	< 0.02
Inorganics					
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Miscellaneous					
Moisture Content	N	%	0.1	37.8	8.7
pH	M	units	0.1	7.1	7.8
Stones Content	N	%	0.1	< 0.1	27.1
Total Organic Carbon	N	%	0.01	3.7	7.3

Results Summary

Report No.: 15-01696

			ELAB Reference	25123	25124
			Customer Reference	TP10, TP14, TP17@0.10	TP2@0.40@1.20, TP3@0.50@1.50
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	Combined	Combined
			Sample Depth (m)	0.10	0.40 - 1.50
			Sampling Date	15/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**		
Organics					
>C8-C10 BCB	N	mg/kg	1	g < 1.0	g < 1.0
>C10-C12 BCB	N	mg/kg	1	g < 1.0	g < 1.0
>C12-C16 BCB	N	mg/kg	1	g < 1.0	g < 1.0
>C16-C21 BCB	N	mg/kg	1	g < 1.0	g 1.2
>C21-C35 BCB	N	mg/kg	1	g < 1.0	g 4.3
>C35-C40 BCB	N	mg/kg	1	g < 1.0	g < 1.0
Total (>C8-C40) BCB	N	mg/kg	1	g < 1.0	g 5.4
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	0.6	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	0.7	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	3	2

Results Summary

Report No.: 15-01696

			ELAB Reference	25125	25126
			Customer Reference	TP6@1.10, TP7@0.60, TP7@0.90	TP11@0.80@2.90, TP12@0.30@0.90
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	Combined	Combined - TP13@0.70
			Sample Depth (m)	0.60 - 1.10	0.30 - 2.90
			Sampling Date	15/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	4.8	5.7
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	6.6	9.0
Copper	M	mg/kg	5	31.8	40.7
Lead	M	mg/kg	5	14.9	41.4
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	20.9	17.9
Selenium	M	mg/kg	1	1.7	2.2
Zinc	M	mg/kg	45	< 45.0	60.4
Anions					
Water Soluble Sulphate	M	g/l	0.02	n/t	0.04
Inorganics					
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Miscellaneous					
Moisture Content	N	%	0.1	6.6	10.8
pH	M	units	0.1	7.8	7.7
Stones Content	N	%	0.1	39.4	28.3
Total Organic Carbon	N	%	0.01	7.1	8.7

Results Summary

Report No.: 15-01696

			ELAB Reference	25125	25126
			Customer Reference	TP6@1.10, TP7@0.60, TP7@0.90	TP11@0.80@2.90, TP12@0.30@0.90
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	Combined	Combined - TP13@0.70
			Sample Depth (m)	0.60 - 1.10	0.30 - 2.90
			Sampling Date	15/04/2015	15/04/2015
Determinand	**Codes**	**Units**	**LOD**		
Organics					
>C8-C10 BCB	N	mg/kg	1	g 1.2	g < 1.0
>C10-C12 BCB	N	mg/kg	1	g 3.6	g < 1.0
>C12-C16 BCB	N	mg/kg	1	g 15.6	g < 1.0
>C16-C21 BCB	N	mg/kg	1	g 19.8	g < 1.0
>C21-C35 BCB	N	mg/kg	1	g 15.2	g < 1.0
>C35-C40 BCB	N	mg/kg	1	g 5.7	g < 1.0
Total (>C8-C40) BCB	N	mg/kg	1	g 61.1	g < 1.0
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	< 0.5	0.6
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	0.9
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	< 2	4

Results Summary

Report No.: 15-01696

ELAB Reference	25127
Customer Reference	TP15@1.00@1.50, TP16@1.00
Sample ID	
Sample Type	SOIL
Sample Location	Combined - TP17@0.60
Sample Depth (m)	0.60 - 1.50
Sampling Date	15/04/2015

Determinand	Codes	Units	LOD	
Metals				
Arsenic	M	mg/kg	1	7.2
Cadmium	M	mg/kg	0.5	< 0.5
Chromium	M	mg/kg	5	10.2
Copper	M	mg/kg	5	31.3
Lead	M	mg/kg	5	19.5
Mercury	M	mg/kg	0.5	< 0.5
Nickel	M	mg/kg	5	20.9
Selenium	M	mg/kg	1	1.6
Zinc	M	mg/kg	45	46.3
Anions				
Water Soluble Sulphate	M	g/l	0.02	n/t
Inorganics				
Hexavalent Chromium	N	mg/kg	0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0
Miscellaneous				
Moisture Content	N	%	0.1	12.0
pH	M	units	0.1	9.4
Stones Content	N	%	0.1	28.2
Total Organic Carbon	N	%	0.01	7.8

Results Summary

Report No.: 15-01696

ELAB Reference	25127
Customer Reference	TP15@1.00@1.50, TP16@1.00
Sample ID	
Sample Type	SOIL
Sample Location	Combined - TP17@0.60
Sample Depth (m)	0.60 - 1.50
Sampling Date	15/04/2015

Determinand	Codes	Units	LOD	
Organics				
>C8-C10 BCB	N	mg/kg	1	g < 1.0
>C10-C12 BCB	N	mg/kg	1	g < 1.0
>C12-C16 BCB	N	mg/kg	1	g < 1.0
>C16-C21 BCB	N	mg/kg	1	g < 1.0
>C21-C35 BCB	N	mg/kg	1	g < 1.0
>C35-C40 BCB	N	mg/kg	1	g < 1.0
Total (>C8-C40) BCB	N	mg/kg	1	g < 1.0
Phenols				
Phenol	M	mg/kg	1	< 1
M,P-Cresol	N	mg/kg	1	< 1
O-Cresol	N	mg/kg	1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1
Trimethylphenol	M	mg/kg	1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5
Polyaromatic hydrocarbons				
Naphthalene	M	mg/kg	0.5	0.6
Acenaphthylene	M	mg/kg	0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	1.6
Anthracene	M	mg/kg	0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5
Total PAH(16)	M	mg/kg	2	4

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 15-01696

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
25108	0.30	TP08	Sandy silty loam	No asbestos detected
25109	0.75	TP09	Silty loam	No asbestos detected
25122	0.15 - 0.30	Combined TP1@0.1	Silty loam	No asbestos detected
25123	0.10	Combined TP10, TP	Silty loam	No asbestos detected
25124	0.40 - 1.50	Combined TP2@0.4	Sandy silty loam	No asbestos detected
25125	0.60 - 1.10	Combined TP6@1.1	Silty loam	No asbestos detected
25126	0.30 - 2.90	Combined - TP13@0	Silty loam	No asbestos detected
25127	0.60 - 1.50	Combined - TP17@0	Silty loam	No asbestos detected

Method Summary

Report No.: 15-01696

Parameter	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil				
Hexavalent chromium	As submitted sample	05/05/2015	110	Colorimetry
pH	Air dried sample	08/05/2015	113	Electromeric
Aqua regia extractable metals	Air dried sample	06/05/2015	118	ICPMS
Phenols in solids	As submitted sample	05/05/2015	121	HPLC
Polyaromatic hydrocarbons (GC-FID)	As submitted sample	05/05/2015	133	GC-FID
Water soluble anions	Air dried sample	05/05/2015	172	Ion Chromatography
Total cyanide	As submitted sample	08/05/2015	204	Colorimetry
Total organic carbon/Total sulphur	Air dried sample	06/05/2015	210	IR
Basic carbon banding in soil	As submitted sample	05/05/2015	218	GC-FID
Asbestos identification	As submitted sample	07/05/2015	PMAN	Microscopy

Report Information

Report No.: 15-01696

Key	
U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

Determinant	Units	GAC Value Residential					
		With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40		
Cadmium	mg/kg	11			85		
Chromium	mg/kg	910			910		
Chromium VI	mg/kg	6			6		
Lead	mg/kg	200			310		
Mercury	mg/kg	40			56		
Nickel	mg/kg	180			180		
Selenium	mg/kg	250			430		
Copper	mg/kg	2400			7100		
Zinc	mg/kg	3700			40000		
Cyanide	mg/kg	791			800		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	120	200	380	440	690	1200
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000
Flourene	mg/kg	170	400	860	2800	3800	4500
Phenanthrene	mg/kg	95	220	440	1300	1500	1500
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000
Fluoranthene	mg/kg	280	560	890	1500	1600	1600
Pyrene	mg/kg	620	1200	2000	3700	3800	3800
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15
Chrysene	mg/kg	15	22	27	30	31	32
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360
TPH C_5-C_6 Aliphatic	mg/kg	**42**	**78**	**160**	**42**	**78**	**160**
TPH C_6-C_8 Aliphatic	mg/kg	**100**	**230**	**530**	**100**	**230**	**530**
TPH C_8-C_{10} Aliphatic	mg/kg	**27**	**65**	**150**	**27**	**65**	**150**
TPH C_{10}-C_{12} Aliphatic	mg/kg	130	330	760	**130**	**330**	**770**
TPH C_{12}-C_{16} Aliphatic	mg/kg	1100	2400	4300	**1100**	2400	4400
TPH C_{16}-C_{35} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_{35}-C_{44} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_5-C_7 Aromatic	mg/kg	70	140	300	370	690	1400
TPH C_7-C_8 Aromatic	mg/kg	130	290	660	860	1800	3900
TPH C_8-C_{10} Aromatic	mg/kg	34	83	190	47	110	270
TPH C_{10}-C_{12} Aromatic	mg/kg	**74**	**180**	**380**	250	590	1200
TPH C_{12}-C_{16} Aromatic	mg/kg	**140**	**330**	**660**	1800	**2300**	**2500**
TPH C_{16}-C_{21} Aromatic	mg/kg	**260**	**540**	**930**	**1900**	**1900**	**1900**
TPH C_{21}-C_{35} Aromatic	mg/kg	**1100**	**1500**	**1700**	**1900**	**1900**	**1900**
TPH C_{35}-C_{44} Aromatic	mg/kg	**1100**	**1500**	**1700**	**1900**	**1900**	**1900**
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.70	1.4
Toluene	mg/kg	130	290	660	880	1900	3900
Ethylebenzene	mg/kg	47	110	260	83	190	440
Xylene	mg/kg	56	130	310	79	180	430

Determinant	Units	GAC Value					
		Residential POS			Commercial		
Arsenic	mg/kg	79			640		
Cadmium	mg/kg	120			190		
Chromium	mg/kg	1500			8600		
Chromium VI	mg/kg	7.7			33		
Lead	mg/kg	630			2330		
Mercury	mg/kg	120			1100		
Nickel	mg/kg	230			980		
Selenium	mg/kg	1100			12000		
Copper	mg/kg	12000			68000		
Zinc	mg/kg	81000			730000		
Cyanide	mg/kg	N/A			16200		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	440	690	1300	440	690	1300
Napthalene	mg/kg	4900	4900	4900	190	460	1100
Acenaphtylene	mg/kg	15000	15000	15000	83000	97000	100000
Acenaphthene	mg/kg	15000	15000	15000	84000	97000	100000
Flourene	mg/kg	9900	9900	9900	63000	68000	71000
Phenanthrene	mg/kg	3100	3100	3100	22000	22000	23000
Anthracene	mg/kg	74000	74000	74000	520000	540000	540000
Fluoranthene	mg/kg	3100	3100	3100	23000	23000	23000
Pyrene	mg/kg	7400	7400	7400	54000	54000	54000
Benzo(a)Anthracene	mg/kg	29	29	29	170	170	180
Chrysene	mg/kg	57	57	57	350	350	350
Benzo(b)Flouranthene	mg/kg	7.1	7.2	7.2	44	44	45
Benzo(k)Flouranthene	mg/kg	190	190	190	1200	1200	1200
Benzo(a)Pyrene	mg/kg	5.7	5.7	5.7	35	35	36
Indeno(123-cd)Pyrene	mg/kg	82	82	82	500	510	510
Dibenzo(a,h)Anthracene	mg/kg	0.57	0.57	0.58	3.5	3.6	3.6
Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C_5-C_6 Aliphatic	mg/kg	570000	590000	600000	**3200**	**5900**	**12000**
TPH C_6-C_8 Aliphatic	mg/kg	600000	610000	620000	**7800**	**17000**	**40000**
TPH C_8-C_{10} Aliphatic	mg/kg	13000	13000	13000	**2000**	**4800**	**11000**
TPH C_{10}-C_{12} Aliphatic	mg/kg	13000	13000	13000	**9700**	**23000**	47000
TPH C_{12}-C_{16} Aliphatic	mg/kg	13000	13000	13000	59000	82000	90000
TPH C_{16}-C_{35} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_{35}-C_{44} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_5-C_7 Aromatic	mg/kg	**56000**	**56000**	**56000**	26000	46000	86000
TPH C_7-C_8 Aromatic	mg/kg	**56000**	**56000**	**56000**	56000	110000	180000
TPH C_8-C_{10} Aromatic	mg/kg	**5000**	**5000**	**5000**	3500	8100	17000
TPH C_{10}-C_{12} Aromatic	mg/kg	**5000**	**5000**	**5000**	16000	28000	**34000**
TPH C_{12}-C_{16} Aromatic	mg/kg	**5100**	**5100**	**5000**	**36000**	**37000**	**38000**
TPH C_{16}-C_{21} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
TPH C_{21}-C_{35} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
TPH C_{35}-C_{44} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
Benzene	mg/kg	72	72	73	27	47	90
Toluene	mg/kg	56000	56000	56000	56000	110000	180000
Ethylebenzene	mg/kg	24000	24000	25000	5700	13000	27000
Xylene	mg/kg	41000	42000	43000	5900	14000	30000

Determinant	Units	GAC Value					
		Park POS			Allotments		
Arsenic	mg/kg	170			43		
Cadmium	mg/kg	532			1.9		
Chromium	mg/kg	33000			18000		
Chromium VI	mg/kg	220			1.8		
Lead	mg/kg	1300			80		
Mercury	mg/kg	240			19		
Nickel	mg/kg	3400			230		
Selenium	mg/kg	1800			88		
Copper	mg/kg	44000			520		
Zinc	mg/kg	170000			620		
Cyanide	mg/kg						
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	440	690	1300	23	42	83
Napthalene	mg/kg	1200	1900	3000	4.1	10	24
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160
Acenaphthene	mg/kg	29000	30000	30000	34	85	200
Flourene	mg/kg	20000	20000	20000	27	67	160
Phenanthrene	mg/kg	6200	6200	6300	15	38	90
Anthracene	mg/kg	150000	150000	150000	380	950	2200
Fluoranthene	mg/kg	6300	6300	6400	52	130	290
Pyrene	mg/kg	15000	15000	15000	110	270	620
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13
Chrysene	mg/kg	93	110	120	4.1	9.4	19
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640
TPH C_5-C_6 Aliphatic	mg/kg	95000	130000	180000	730	1700	3900
TPH C_6-C_8 Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000
TPH C_8-C_{10} Aliphatic	mg/kg	14000	18000	21000	320	770	1700
TPH C_{10}-C_{12} Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300
TPH C_{12}-C_{16} Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000
TPH C_{16}-C_{35} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_{35}-C_{44} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_5-C_7 Aromatic	mg/kg	**76000**	**84000**	**92000**	**13**	**27**	**57**
TPH C_7-C_8 Aromatic	mg/kg	**87000**	**95000**	**100000**	**22**	**51**	**120**
TPH C_8-C_{10} Aromatic	mg/kg	**7200**	**8500**	**9300**	**8.6**	**21**	**51**
TPH C_{10}-C_{12} Aromatic	mg/kg	**9200**	**9700**	**10000**	**13**	**31**	**74**
TPH C_{12}-C_{16} Aromatic	mg/kg	**10000**	**10000**	**10000**	**23**	**57**	**130**
TPH C_{16}-C_{21} Aromatic	mg/kg	**7600**	**7700**	**7800**	**46**	**110**	**260**
TPH C_{21}-C_{35} Aromatic	mg/kg	**7800**	**7800**	**7900**	**370**	**820**	**1600**
TPH C_{35}-C_{44} Aromatic	mg/kg	**7800**	**7800**	**7900**	**370**	**820**	**1600**
Benzene	mg/kg	90	100	110	0.017	0.034	0.075
Toluene	mg/kg	87000	95000	100000	22	51	120
Ethylebenzene	mg/kg	17000	22000	27000	16	39	91
Xylene	mg/kg	17000	23000	31000	28	67	160

Controlled Waters Assessment Reference Values

Determinant	Unit	EQS Freshwater						Uk DWS	WHO
Hardness	mg/l	0-50	50-100	100-150	150-200	200-250	>250		
Arsenic	ug/l	50						10	10
Boron	ug/l	2000						1000	0.3
Cadmium	ug/l	5						5	3
Chromium	ug/l	2	10	10	20	20	20	50	50
Lead	ug/l	4	10	10	20	20	20	10	10
Mercury	ug/l	1						1	1
Selenium	ug/l							10	10
Copper	ug/l	0.5	3	3	3	8	12	20000	2000
Nickel	ug/l	8	20	20	40	40	40	20	70
Zinc	ug/l	8	15	15	50	50	50	5000	3000
Sulphate	mg/l	400						250	250
PAH	ug/l							0.1	
Anthracene	ug/l	0.02							
Napthalene	ug/l	10							
Benzo(a)Pyrene	ug/l	0.03							0.01
Fluoranthene	ug/l	0.02							
Benzene	ug/l	30						1	10
Toluene	ug/l	50							
Ethylebenzene	ug/l	20							
Xylene	ug/l	30							
$C_5 – C_6$ Aliphatic	ug/l								15000
$C_6 – C_8$ Aliphatic	ug/l								15000
$C_8 – C_{10}$ Aliphatic	ug/l								300
$C_{10} – C_{12}$ Aliphatic	ug/l								300
$C_{12} – C_{16}$ Aliphatic	ug/l								300
$C_{16} – C_{36}$ Aliphatic	ug/l								N/A
$C_6 – C_7$ Aromatic	ug/l								10
$C_7 – C_8$ Aromatic	ug/l	50							10
$C_8 – C_{10}$ Aromatic	ug/l	20							300
$C_{10} – C_{12}$ Aromatic	ug/l								1000
$C_{12} – C_{16}$ Aromatic	ug/l								1000
$C_{16} – C_{21}$ Aromatic	ug/l								90
$C_{21} – C_{35}$ Aromatic	ug/l								90

Geosynthetics Soil & Steel Laboratories Ltd
Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
T: +44 (0)1484 454100 F: +44 (0)1484 454101
E: info@geosynthetics-lab.com W: www.geosynthetics-lab.com

CONFIDENTIAL SOILS TEST REPORT

12 May 2015

FAO Mr Richard Hamilton
Enzygo Ltd
The Granary
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

Tel/Fax: +44 (0) 1454 269237

Dear Richard,

Thank you for consulting GSSL Ltd for your Geotechnical testing needs. GSSL Ltd is pleased to submit this **final interim** test report for laboratory testing.

Client Ref/Order No: CRM.1277

Test Report Number: GS-CRM.002

Contract Reference: Nine Point Mile

Client ID, Visual Sample Descriptions: **Page 2**

Results: Page 3-7

Test(s) Requested;

Determination of Chemical properties of Soil

Determination of Moisture Content Oven Drying Method	{BS 1377-2:1990 Cl.3.2}
Determination of the Liquid Limit – Cone Penetrometer (Definitive Method)	{BS 1377-2:1990 Cl. 4.3}
Determination of the Plastic Limit, Plasticity Index	{BS 1377-2:1990 Cl. 5}
Determination of Particle Size Distribution by Dry sieving method	{BS 1377-2:1990 Cl. 9.3}
Determination of the California Bearing Ratio (Lab CBR Un-soaked / Top & Bottom ends)	{BS 1377-4: 1990 Cl.7}

If you have any questions or require additional information, then please do not hesitate to contact us.
Yours Sincerely

Tony Dixon
Managing Director

Any opinions and interpretations expressed within this report are outside the scope of our UKAS Accreditation.

Company Registration Number: 4832910 Registered in England and Wales

Geosynthetics Soil & Steel Laboratories Ltd
Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
T: +44 (0)1484 454100 F: +44 (0)1484 454101
E: info@geosynthetics-lab.com W: www.geosynthetics-lab.com

Summary of laboratory soil descriptions

Contract Ref: Nine Point Mile **Report Ref. No:** GS-CRM.002

Client ID	Depth (m)	Description of Sample
TP8	0.35	Very gravelly SAND
TP9	0.45	Clayey very gravelly SAND
TP12	4.00	Stiff gravelly very sandy silty CLAY
TP3	3.50 & 5.00	Slightly silty sandy GRAVEL

Certification:-
Test results reported herein do not apply to samples other than those supplied. GSSL Ltd neither accepts responsibility for nor makes claim as to the final use & purpose of the materials(s).

Approved Signatory:

Date Reported: 12/05/15

Company Registration Number: 4832910 Registered in England and Wales

Geosynthetics Soil & Steel Laboratories Ltd
Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
T: +44 (0)1484 454100 F: +44 (0)1484 454101
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Chemical properties of Soil
Water Soluble Sulphate & Ph Value.
BS 1377:1990: Part 3 cl.3-9.

Contract Ref: Nine Point Mile **Report Ref. No:** GS-CRM.002

CLIENT ID	DEPTH (m)	*Material passing 2mm BS Test Sieve (% dry mass of original sample)*	*Water Soluble Sulphate 2:1*		*pH Value*
			Sulphate content as SO_3 of 2:1 soil/water extract (g/l)	*Sulphate content as SO_4 of 2:1 soil/water extract (g/l)*	
TP12	4.00	100	0.1	0.2	8.5
TP3	3.50 & 5.00	100	<0.1	0.1	8.3

Certification:-
Test results reported herein do not apply to samples other than those supplied. GSSL Ltd neither accepts responsibility for nor makes claim as to the final use & purpose of the materials(s).

Approved Signatory:

Date Reported: 12/05/15

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Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
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Determination of Moisture Content & Atterberg Limits

Contract Ref: Nine Point Mile **Report Ref. No:** GS-CRM.002
Sample Preparation: Specimens taken from their Wet State

Client ID	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	% Passing 425µm test sieve	Remarks
TP3	3.00 & 5.00	7.0	20	NON-PLASTIC			-

Certification:-
Test results reported herein do not apply to samples other than those supplied. GSSL Ltd neither accepts responsibility for nor makes claim as to the final use & purpose of the materials(s).

Approved Signatory:

Date Reported: 12/05/15

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Geosynthetics Soil & Steel Laboratories Ltd
Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
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E: info@geosynthetics-lab.com W: www.geosynthetics-lab.com

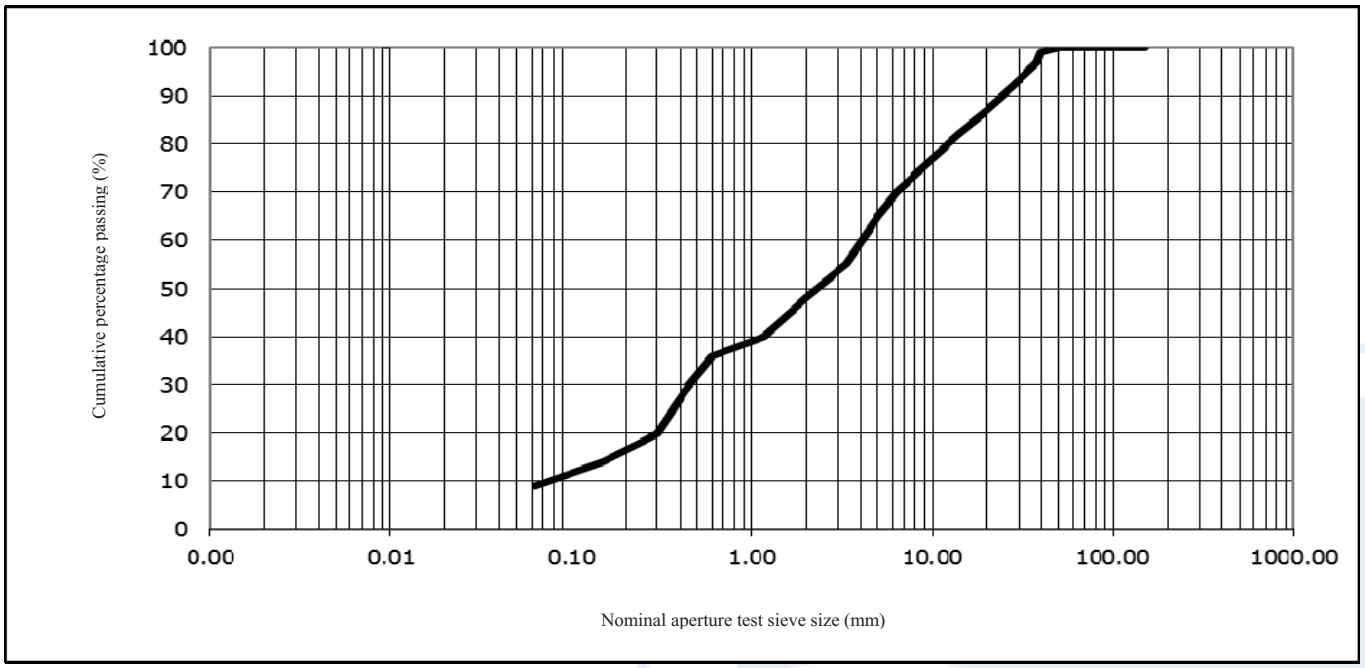
Determination of Particle Size Distribution (Dry Sieving)

Report Ref. No: GS-CRM.002

GSSL Sample ID	A1
Client ID	TP3 @ 3.50 & 5.00m
Client:	Enzygo Ltd
Site:	Nine Point Mile
Date Sampled:	N/A
Sampled from:	-
Material Specification:	N/A
Sample Description:	Slightly silty sandy GRAVEL
Sample Type:	Disturbed
Sampled by:	Client
Date Sampled:	N/A
Remarks:	-

Soil Fraction	*Total Percentage*
COBBLES	-
GRAVEL	52
SAND	39
SILT / CLAY	9

BS Test Sieve (mm)	*% Material Passing*
125	100
90	100
75	100
63	100
50	100
40	99
37.5	97
28	92
20	87
14	82
10	77
6.3	70
5	65
3.35	55
2	48
1.18	40
0.6	36
0.425	29
0.3	20
0.15	14
0.063	9



Sample Preparation: In accordance with BS 1377-1 & 2:1990

Certification:-

Test results reported herein do not apply to samples other than those supplied. GSSL Ltd neither accepts responsibility for nor makes claim as to the final use & purpose of the materials(s)

Approved Signatory:

Date Reported: 12/05/15

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Geosynthetics Soil & Steel Laboratories Ltd
Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
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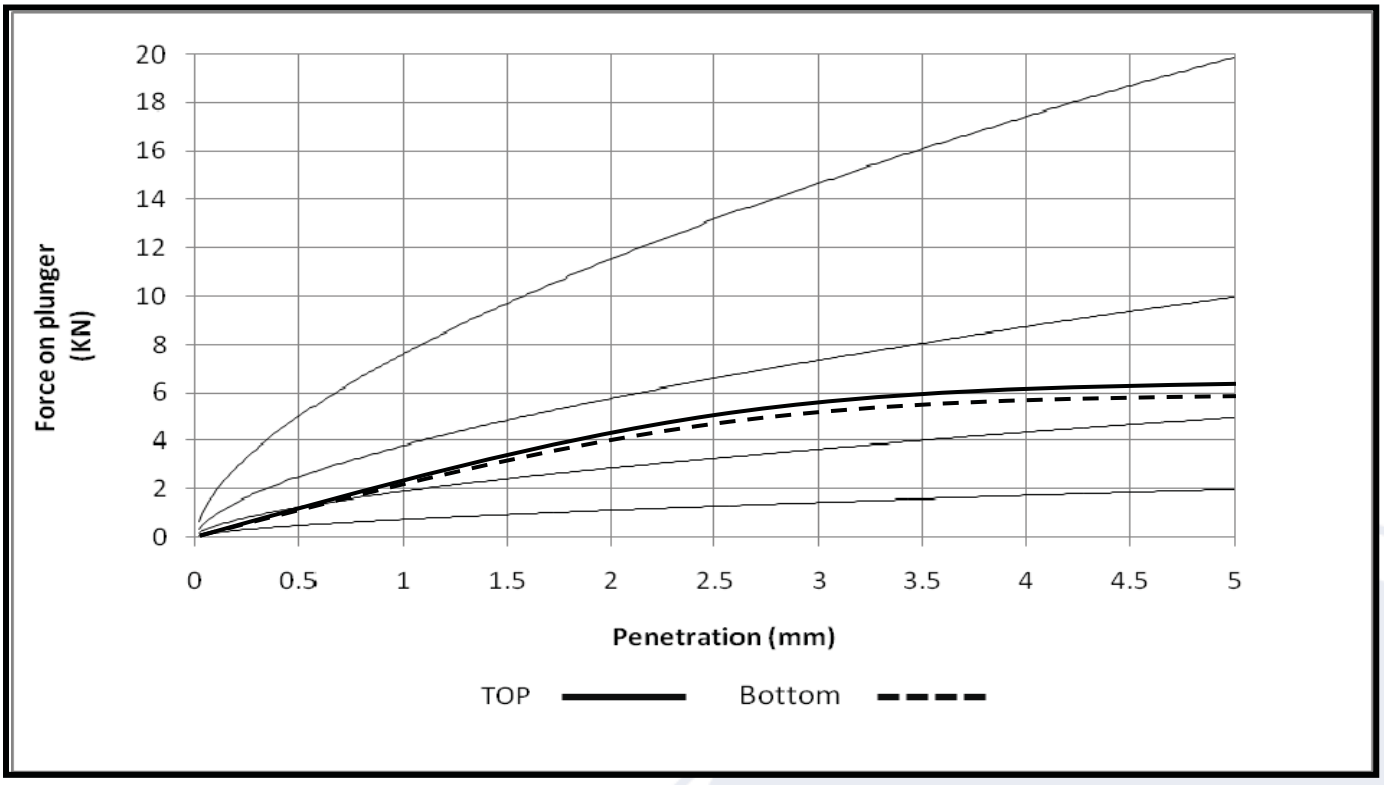
Determination of California Bearing Ratio BS 1377: Part 4:1990

Contract Ref: Nine Point Mile **Report Ref. No:** GS-CRM.002
Sample description: Very gravelly SAND
Client Sample ID: TP8 @ 0.35m

INITIAL SAMPLE CONDITIONS		*TEST CONDITIONS*		**Method of compaction:**		2.5kg rammer
Moisture Content %:	10.5	**Surcharge Kg:**	13	**Final Moisture Content %**		**Calculated CBR Value %**
Bulk Density (measured) Mg/m³:	2.09	**Soaking Time hrs:**	-	**Sample Top**	10.5	CBR @ 2.5mm = 38.5 CBR @ 5.0mm = 31.1
Dry Density (measured) Mg/m³:	1.81	**Swelling mm:**	-	**Sample Bottom**	10.5	CBR @ 2.5mm = 35.0 CBR @ 5.0mm = 28.4
Percentage retained on 20mm BS test sieve:	12	**Remarks:** Tested in accordance with BS1377: 1990 Part 4 Sample preparation method 2.5kg rammer				



Certification:-
Sample Preparation: In accordance with BS 1377-4: 1990 : Clause 7.2.4.4. Moisture Content determined in accordance with BS 1377-2: 1990 Clause 3.2.
CBR Tested in accordance with BS 1377-4: 1990 Clause 7

Approved Signatory:

Date Reported: 12/05/15

Company Registration Number: 4832910 Registered in England and Wales

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Calder Trading Estate, Leeds Road, Bradley, Huddersfield, West Yorkshire HD5 0RS
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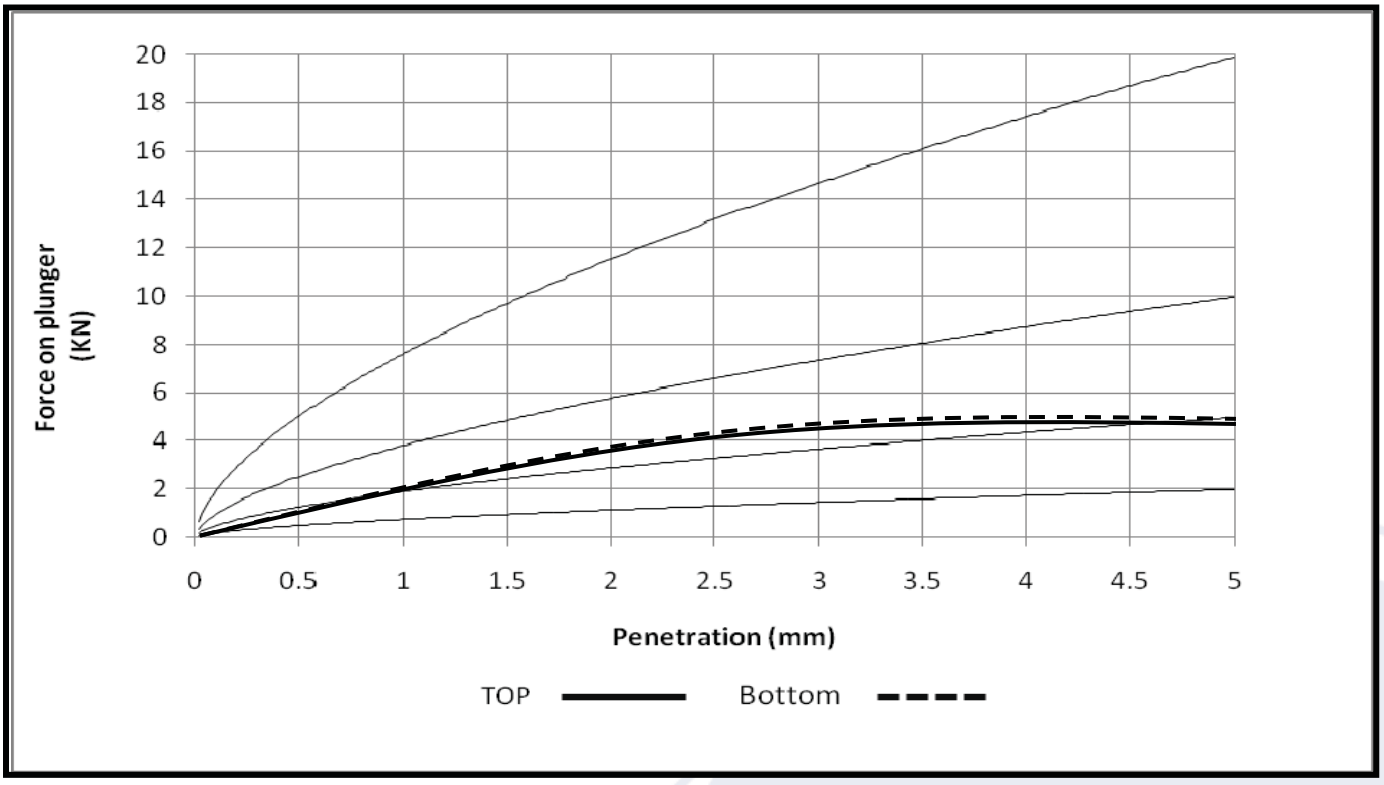
E: info@geosynthetics-lab.com W: www.geosynthetics-lab.com

Determination of California Bearing Ratio BS 1377: Part 4:1990

Contract Ref: Nine Point Mile **Report Ref. No:** GS-CRM.002
Sample description: Clayey very gravelly SAND
Client Sample ID: TP9 @ 0.45m

INITIAL SAMPLE CONDITIONS		*TEST CONDITIONS*		**Method of compaction:**		2.5kg rammer
Moisture Content %:	14.2	**Surcharge Kg:**	13	**Final Moisture Content %**		**Calculated CBR Value %**
Bulk Density (measured) Mg/m³:	1.98	**Soaking Time hrs:**	-	**Sample Top**	14.2	CBR @ 2.5mm = 30.4 CBR @ 5.0mm = 24.8
Dry Density (measured) Mg/m³:	1.76	**Swelling mm:**	-	**Sample Bottom**	14.2	CBR @ 2.5mm = 31.2 CBR @ 5.0mm = 26.0
Percentage retained on 20mm BS test sieve:	8	**Remarks:** Tested in accordance with BS1377: 1990 Part 4 Sample preparation method 2.5kg rammer				



Certification:-
Sample Preparation: In accordance with BS 1377-4: 1990 : Clause 7.2.4.4. Moisture Content determined in accordance with BS 1377-2: 1990 Clause 3.2.
CBR Tested in accordance with BS 1377-4: 1990 Clause 7

Approved Signatory:

Date Reported: 12/05/15

Company Registration Number: 4832910 Registered in England and Wales

Enzygo specialise in a wide range of technical services:

Property and Sites
Waste Planning
Waste Technologies and Renewables
Waste Technologies
Landscape Architecture
Environmental Co-ordination
Hydrology and Flood Risk
Waste Contract Procurement
Minerals Planning
Noise and Vibration
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Environmental Planning
Ecology Services
Contaminated Land and Geotechnical

BRISTOL OFFICE
The Granary
Woodend Lane
Cromhall
Bristol GL12 8AA
Tel: 01454 269237
Fax: 01454 269760

kevin.parr@enzygo.com

SHEFFIELD OFFICE
STEP Business Centre
Wortley Road
Deepcar
Sheffield S36 2UH
Tel: 0114 2903677
Fax: 0114 2903688

matt.travis@enzygo.com

MONMOUTH OFFICE, WALES
Singleton Court Business Park
Wonastow Road
Monmouth
Monmouthshire NP25 5JA
Tel: 01600 714611
Fax: 01600 716744

chris.formaggia@enzygo.com

Please visit our website for more information.

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Appendix B – Updated Operational Techniques and Monitoring Plan

enzygo
environmental consultants

Operational Techniques and Monitoring Plan - EPR/AB3695CH

Nine Mile Point Waste Processing Facility

Hazrem Environmental Ltd

CRM 083 002 PE R 006 B

'Experience and expertise working in union'

enzygo.com

Contact Details:

Enzygo Ltd.
The Byre
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

tel: 01454 269237
email: peter.cumberlidge@enzygo.com
www: enzygo.com

Operational Techniques and Monitoring Plan CRM 083 002 PE R 006 B

Project:	Nine Mile Point Waste Processing Facility
For:	Hazrem Environmental Ltd
Status:	FINAL
Date:	October 2019
Author:	Steph Charnaud, Director of Permitting
Reviewer:	Peter Cumberlidge, Director

Contents

Tables & Figures

1.0 INTRODUCTION

1.1. Overview

1.1.1. This document provides information to support Environmental Permit **EPR/AB3695CH**, to provide details of the operational techniques that will be used to minimise and control emissions from the proposed Nine Mile Point waste processing facility.

1.1.1. The Facility is to occupy an area of 1.09 hectares within the approximately 16 hectare Nine Mile Point industrial estate. The site is bordered by an industrial unit to the east, a road to the west (beyond which are further industrial units), a road to the south (beyond which is woodland and the Sirhowy River), and to the north by woodland.

1.1.2. The nearest residential properties are on New Road, approximately 470m northeast of the eastern site boundary, and on William Street - approximately 478m west of the western edge of the site boundary.

1.1.2. The Operator of the Facility will be Hazrem Environmental Ltd, hereby referred to as "the Operator".

1.2. Site Location

1.2.1. The Facility is located at:

Nine Mile Point Industrial Estate,

Ynysddu,

Cwmfelinfach,

Caerphilly,

NP11 7HZ

1.2.2. The site boundary is illustrated in green on the 'Installation Boundary' drawing referenced CRM 083 002 PE D 001. The site is centred at National Grid Reference (NGR) **ST 19235 91305.**

1.2.3. The location is shown on Site Location' drawing referenced CRM 082 002 PE D 001 in the drawings section of this application.

1.3. Regulated Activities

1.3.1. The Operator is permitted to operate a Bespoke Part A Installation Environmental Permit for a Waste Processing facility. The facility produces Solid Recovered Fuel (SRF) and Refuse Derived Fuel (RDF), accepting up to 100,000 tonnes per annum of waste. As such, a Bespoke application was prepared to fully assess the risks posed by the activity and to fully assess the proposed activity against Best Available Techniques (BAT).

1.3.2. Permitted wastes will be limited to the waste codes included in Appendix A and will generically comprise non-hazardous commercial, industrial and household waste.

1.3.3. The scope of all proposed regulated activities is summarised in Table 1.3.3 below. The site layout is shown on 'Installation Boundary' drawing referenced CRM 083 002 PE D 001.

Table 1.3.1: Regulated Activities

<table>
<tr><th>Schedule 1 Activity</th><th>Description of the Waste operation</th><th colspan="2">Annex I (D Codes) and Annex II (R Codes() and Descriptions</th></tr>
<tr><td rowspan="8">Part A(1) Section 5.4 Part A(1)(b) ii)</td><td rowspan="8">Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving pre-treatment of waste for incineration or co-incineration.
Bulking of recyclable wastes recovered as an incidental part of production of SRF/RDF</td><td colspan="2">Annex II Codes and Descriptions</td></tr>
<tr><td colspan="2">R3: Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).</td></tr>
<tr><td colspan="2">R4: Recycling/reclamation of metals and metal compounds.</td></tr>
<tr><td colspan="2">R5: Recycling/reclamation of other inorganic materials.</td></tr>
<tr><td colspan="2">R13: Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced).</td></tr>
<tr><td><u>Total waste Storage Capacity</u></td><td>828 tonnes</td></tr>
<tr><td><u>Non Hazardous Waste Treatment Capacity</u></td><td>100,000 tonnes per annum which equates to 360 tonnes per day based on 278 operational days per year</td></tr>
</table>

1.4. Relevant Legislation and Guidance

1.4.1. The proposed activities are subject to a number of National, European and International legislation and statutory and non-statutory guidance documents. Operators are required through the Environmental Permit application process, to demonstrate how they will comply with the relevant requirements of this legislation and guidance.

1.4.2. In relation to the proposed waste operations the following pieces of legislation and guidance are considered relevant:

- Waste Framework Directive;
- Environmental Permitting (England & Wales) Regulations 2016 (as Amended 2019);
- Natural Resource Wales: How to comply with your environmental permit, Version 8, October 2014;
- Environment Agency: Risk assessments for your environmental permit, updated May 2018;
- Environmental Permitting Core Guidance, Defra; March 2013;
- Environmental Permitting Guidance: The Waste Framework Directive, Defra 2011;

- Sector Guidance Note S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste, Environment Agency 2013;
- Establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council, 10th August 2018;
- Best Available Techniques (BAT) Reference Document for Waste Treatment 2018;
- Waste duty of care: code of practice, updated November 2018;
- Natural Resources Wales and Environment Agency, Horizontal Guidance Series; and
- Natural Resources Wales Regulatory Guidance Series.

1.5. Scope of Report

1.5.1. This Report considers the operating procedures of the proposed facility and how they meet relevant guidance and best industry practice. The report also describes how the emissions from the facility will be controlled and monitored, and how the site will be managed to mitigate the environmental impact of the operations and remain in accordance with the Environmental Permit.

2.0 OPERATING TECHNIQUES AND BAT

2.1. Pre-Acceptance Procedures for Incoming Waste

2.1.1. Pre- acceptance procedures will be in place prior to commencement of operations at the Nine Mile Point Waste Processing Facility. The Operator will ensure that the requirements detailed in Section 2.1.1 Pre-acceptance procedures to assess waste of Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013 are incorporated into on-site procedures.

2.1.2. The Nine Mile Point Waste Processing Facility will have capacity to process up to 100,000 tonnes of waste per annum.

2.1.3. A complete list of waste types to be accepted at the facility is provided within Appendix A to this report.

2.1.4. All waste will be delivered by road to site and will be weighed using the on-site weighbridge. This will be the only access route into the site for waste delivery vehicles.

2.1.5. All deliveries to the site will be subject to pre-acceptance evaluation and delivery schedule as agreed with customers prior to arrival on site.

2.1.6. There will be no ad-hoc waste deliveries. In the event that a vehicle arrives on site and it is verified that there has been no prior agreement made to receive that vehicle, the delivery will be refused and vehicle turned away, and the incident recorded in the site diary.

2.1.7. The following information will be requested from all customers prior to waste being accepted on site:

- Producer details;
- Details of current holder of the waste, if this is not the producer;
- Waste EWC Code (where appropriate);
- Process generating SIC Code (where appropriate);
- Delivery container type (where appropriate);
- Written description of the material, including composition of the waste; handling requirements and hazards; and quantity and form of the waste; and
- Anticipated date and time of delivery.

2.1.8. Waste delivery contracts will not be entered into until the operator is confident that the facility is able to receive the waste, and that the nature of material can also be processed without impacting on operations and impacting on any nearby sensitive receptors.

2.2. Acceptance Procedures

2.2.1. The Operator will ensure that the requirements detailed in Section 2.1.2 '*Acceptance procedures when waste arrives at the installation'* of Sector Guidance *Note 'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste*', Environment Agency 2013 are incorporated into on-site procedures.

2.2.2. Waste will be delivered to the site during the following operational hours:

- Monday – Friday 07:30 – 18:30

- Saturday 07:30 – 13:00
- No deliveries will take place on Sundays or Public/Bank Holidays.

2.2.3. All delivery vehicles entering the site will park at the cabin by the weighbridge to undertake Duty of Care paperwork checks.

2.2.4. Where possible, the Weighbridge Operative Clerk will carry out a visual inspection of the incoming wastes before they are off-loaded in the waste reception hall. The Machine Operator within the tipping area will also visually check each load and escalate to the Shift Supervisor if any malodorous loads or non-conforming wastes are tipped. The vehicle driver will be advised to wait in case the loads needs to be rejected or dealt with separately.

- Wastes will not be accepted at the facility for disposal;
- Details and description of the vehicle delivering the waste, the driver's name and the operator of the vehicle will be taken; and
- A description of the waste by type and quantity will be recorded.

2.2.5. Waste will only be received on site using sheeted skips/containers and following unloading will be stored within the waste reception building.

2.2.6. Waste deliveries will be prohibited from entering the site if the reception area is found to be at full capacity and there is insufficient space for storage of waste or incoming vehicles on site.

2.2.7. Any wastes which are found not to comply with the conditions of the Environmental Permit, or do not conform to the description provided by the waste carrier/producer will be rejected with records maintained.

2.2.8. If non-conforming wastes are accepted onto the site they shall be placed within the designated quarantine area and removed off site to an appropriately permitted site or sent back to the previous waste holder. Records of non-conforming wastes, including quantities and storage details, as well as details of the facilities they are sent to will be maintained.

2.3. Waste Storage and Handling on-site

2.3.1. The Operator will ensure that the relevant requirements detailed in '*Section 2.1.3 Waste Storage'* of Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste*', Environment Agency 2013 are incorporated into on-site procedures. Storage arrangements are detailed below for each generic waste type and are designed to minimise the number of time waste needs to be handled at the facility.

2.3.2. All activities will take place within the main reception building including tipping and storage of incoming waste, and storage of recyclable and reject materials with the exception of storage of baled SRF/RDF and the drying of waste to produce the SRF/RDF.

2.3.3. Within the building, a reception bay, which is approximately 2400m^3 and capable of storing 610 tonnes of waste, will be designated to receive incoming waste. Waste will remain here for a maximum of 24 hours before entering the process.

2.3.4. Wastes will be segregated to separate recyclable wastes from the waste received. The remaining bulk waste will be treated to produce SRF or RDF as outlined below. Details of storage of the separated materials is outlined in table 2.3.4 below.

Table 2.3.1 Storage capacities of each segregated waste type

Waste types	Containment	Storage capacity (Tonnes)
Ferrous Metals	In bay in reception building which has an impermeable floor	17.95
Non-Ferrous Metals	In bay in reception building which has an impermeable floor	8.45
Heavy wastes (including items such as bricks, wood, rocks, glass, some food waste	In bay in reception building which has an impermeable floor	71.64
Fines	In bay in reception building which has an impermeable floor	41.54
PVC	In bay in reception building which has an impermeable floor	9.08
Temporary storage of wastes to be placed into the dryer	In bunker in reception area which has an impermeable floor	69.31
	Total	**217.97**

2.3.5. The waste is loaded into the primary-shredder followed by screening to separate out the fines. The primary shredder has a dust suppressant system which reduces dust emissions.

2.3.6. The waste will then be passed through an over band magnet, eddy current separators and a near infrared optical sorter to remove any recyclables such as ferrous and non-ferrous metals and plastics such as PVC. The removal of PVC will lead to a reduction in the chlorine emissions from the waste when it is finally used as a fuel.

2.3.7. Material is then shredded to the appropriate particle size which is dependent upon the output specification required. The secondary shredders also have dust suppressant technology which reduces dust emissions.

2.3.8. The shredded waste is transferred to a drum dryer which reduces the moisture content by heating the waste to a temperature of 80°C. The hot process air will be generated from the combustion of natural gas.

2.3.9. Treatment of the exhaust air from the dryer will consist of a baghouse filter which will reduce the dust content and a Regenerative Thermal Oxidiser which will minimise the odorous components in the exhaust gas. Once treated the gas will be released via a stack.

2.3.10. Once shredded and dried, the waste is then transferred either to the baling and wrapping equipment or stored loose ready for the material to be removed in bulk.

2.3.11. Where the specification for production of solid recovered fuel (SRF) cannot be achieved from the input waste received, waste will be graded as refuse derived fuel (RDF). Production of RDF does not need to adhere to the same stringent specification as SRF and therefore doesn't require drying. RDF will follow the same process steps outlined above however it will bypass the drying process; shredded waste will in such case be transferred directly to the baler.

2.3.12. An RDF Monitoring Unit is used to evaluate the quality and composition of the RDF/SRF produced. The unit calculates and transmits the RDF net calorific value, chlorine content, moisture content and biogenic content to the SCADA system.

2.3.13. The baled waste is then wrapped with five layers of wrapping. This is necessary to protect the waste and keep the moisture content down. It also acts as a protection measure to prevent litter as all baled waste is to be stored externally to the main reception building under a canopy. Bales will be monitored daily to ensure that any splitting of wrapping is identified at an early stage and rectified immediately.

2.3.14. Bales will be stored to a maximum height of 4 metres (or 4 high, whichever is lower). The storage area for bales of RDF/SRF is 267m². There is storage capacity on site for approximately 600 bales.

2.3.15. It is anticipated that typical storage times for baled wastes will be less than 1 month. The maximum storage time will be 3 months. This is so sufficient loads are available to fill transportation containers to minimise vehicle movements and associated costs and environmental impact.

2.3.16. Appendix C contains a Process Flow Chart.

2.4. General Waste Storage

2.4.1. As stated above, waste will be delivered to the site in skips and bulk waste carriers, and once discharged will be stored within the main reception building. The waste will be sorted into different fractions, for recycling, recovery or disposal.

2.4.2. The reception building floor will be an impermeable surface capable of being cleaned and will be discharged to sewer under a discharge consent with Dwr Cymru via a sealed drainage system.

2.4.3. The waste reception building will be fitted with roller shutter doors and kept under negative pressure with internal air being taken to the odour abatement system of the dryer.

2.4.4. .Variable speed fans will be installed which have sufficient capacity to serve the man building when the doors are both closed and opened. The speed of the extraction fans within the building will be increased when the roller shutter doors are open to ensure air is drawn into the building rather than escaping from the building.

2.4.5. Recyclates for example metals and plastics will be stored inside the building in bays following segregation undertaken in the reception building and will be removed off site for recycling. The quantities of recyclates, storage locations at the facility and details of where recyclates are sent to for reprocessing will be maintained.

2.5. Transfer of Baled Waste Off-Site

2.5.1. Details of where the RDF and SRF are transported to will be maintained along with the quantities and dates the bales were transported off site as required by Section 34 (7) of the Environmental Protection Act 1990 and the Waste Duty of Care: Code of Practice, 2018.

3.0 EMISSIONS CONTROL

3.1. Overview of Releases

3.1.1 There are no point source emissions to land, groundwater or water (other than surface water). Foul drainage is discharged via sewer.

3.1.2 A qualitative assessment of emissions to air, water and land plus amenity and accident risks is provided in document referenced CRM 083 002 PE R 005 Environmental Risk Assessment.

3.2. Control of Point Source Emissions to Air, Water and Land

3.2.1 There will be one point source emission to air at Nine Mile Point Waste Processing Facility which arises from the waste dryer.

3.2.2 This point source emission is listed in the table below and is marked on the Installation Boundary drawing referenced CRM 083 002 PE D 002.

Table 3.2.1: Point Source Emissions to Air

Air Emission Point Reference and Location	Source of Emission	Emissions
A1 – Stack from dryer and RTO	Building and drying process	NOx, SO_2, CO, CO_2 and particulates

3.2.3 Surface water drainage and clean run-off from the roof will be discharged via full retention interceptors to storage crates. Surface water will then be released to the existing surface water drains on the industrial estate (see drawing referenced Site Drainage CRM 083 002 PE D 003).

3.2.4 Foul drainage from the reception building will be discharged to sewer under a discharge consent with Dwr Cymru (see drawing referenced Site Drainage CRM 083 002 PE D 003.)

3.3. Control of Fugitive Emissions to Air

3.3.1 The main sources of fugitive emissions will be dust from waste handling and treatment.

3.3.2 Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013 references specific controls for minimisation of dust emissions in Section 3.3.4. Good management practices and procedures proposed will minimise emissions and will prevent unacceptable levels of dust impacting local receptors. Table 3.3.1 below compares procedures on site with indicative BAT requirements.

Table 3.3.1: Indicative BAT Requirements for Control of Fugitive Emissions to Air (Dust)

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
Covering of skips and vessels	Loaded vehicles are sheeted to minimise spillages and prevent wind- blown dust and litter.	Yes

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
Avoidance of outdoor or uncovered stockpiles (where possible)	There will be no outdoor stockpiles of waste other than baled RDF/SRF. All loose waste will be stored within the reception building.	Yes
Where dust creation is unavoidable, use of sprays, binders, stockpile management techniques, windbreaks and so on	All activities are carried out within the main reception building with the exception of drying. The dryer is fitted with a bag filter which will filter particulates from the air flow. Filtration efficiency will be <5mg/m³.The primary and secondary shredders are also fitted with dust suppressors which limit the output of dust to 5mg/m³.	Yes
Regular wheel and road cleaning (avoiding transfer of pollution to water and wind blow)	Wheel cleaning will be in place on-site and will be employed as required on should inspection deem it necessary. Vehicles are inspected for mud, litter, dust and debris prior to leaving site.	Yes
Closed conveyors, pneumatic or screw conveying (noting the higher energy needs), minimising drops. Filters on the conveyors to clean the transport air prior to release	All processing activities are carried out within the main reception building. A dust suppression system will be in place, consisting of 4 dust suppression units. These units will collect dust and convert it to a solid form. The dust will be conveyed with the RDF output. Filtration efficiency will be 5mg/m³.	Yes
Regular housekeeping	The site access road & hardstanding will be inspected by the Site Manager on a daily basis to determine the need for maintenance and cleaning, and litter picking. All departing road transport will be inspected for cleanliness, prior to leaving the site. Paved roads will be swept and washed regularly as determined by Site Manager inspections. The waste reception and processing building will be inspected on a daily basis and cleared down regularly.	Yes
Enclosed silos (for storage of bulk powder materials) vented to fabric filters. The recycling of collected material should be considered under Section 2.6.	Not applicable, no silos are required on-site.	Not applicable
Enclosed containers or sealed bags used for smaller quantities of fine materials	All material will be stored within a fully enclosed building except for the baled SRD/RDF. This will be wrapped five times and stored within a covered bay.	Yes

3.3.3 It can be concluded that the measures proposed to control fugitive emissions to air will meet the requirements laid out in Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013.

3.4. Control of Fugitive Releases to Water, Land and Groundwater

3.4.1 The main source of any fugitive emissions is site surface water drainage which is directed to storage crates via full retention interceptors then released into the industrial estate's existing surface water drainage system. There are no wastes stored externally with the exception of baled RDF/SRF which will be wrapped five times and inspected for splits in the packaging. Any splits will be repaired immediately.

3.4.2 Wastes which may generate polluting leachates will be stored within the main reception building where hard standing will be installed and will discharge to sewer.

3.4.3 Silt traps and oil interceptors will be inspected on a regular basis to check their integrity and be maintained to prevent overfilling along with the site drainage system.

3.4.4 Operational procedures will ensure that hard standing areas are inspected for damage on a daily basis and any repairs are carried out promptly and to the original standard and specification.

3.4.5 All site personnel will be tasked with monitoring for evidence of spills and debris during their day to day routine. Any evidence of spills and debris will be reported to the Site Manager. Clean-up procedures will be implemented to contain and remove potentially polluting material. Records of any pollution incidents including corrective actions will be maintained. Natural Resources Wales will be notified as per requirements of the Environmental Permit.

3.4.6 Spill kits will be maintained in order to respond to any spill. The Operator will also have in place emergency measures to deal with any spillages (e.g. the deployment of absorbent mats and booms).

3.4.7 Training will be provided to all staff relating to the use of spill kits and the Spill Clean-Up Procedures.

3.4.8 All site personnel will be tasked with monitoring for evidence of spillages and leakage during their day to day routine. Any evidence of spillage or leakage will be reported to the Site Manager or his nominated deputy for remedial action.

3.4.9 Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013 references specific controls for minimisation of fugitive releases to water, sewer and groundwater in Section 2.2.5 which has been compared with measures proposed by the Operator in Table 3.4.10 below:

Table 3.4.1: Indicative BAT Requirements for Control of Fugitive Emissions to Water and Groundwater

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
For surfacing: • Design appropriate surfacing and containment or drainage facilities for all operational areas, taking into consideration collection capacities, surface thicknesses, strength/reinforcement; falls,	Waste materials are non-hazardous therefore the pollution risk is considered low.	Yes

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
materials of construction, permeability, resistance to chemical attack, and inspection and maintenance procedures; • Have an inspection and maintenance programme for impervious surfaces and containment facilities; • Unless the risk is negligible, have improvement plans in place where operational areas have not been equipped with: – an impervious surface – spill containment kerbs – sealed construction joints – connection to a sealed drainage system	Drainage system is connected to an interceptor which is subject to regular inspection and maintenance. The waste reception building will be constructed on impermeable hard standing. All surfacing will be inspected regularly in accordance with the site's EMS.	
Above ground tanks: All above-ground tanks containing liquids whose spillage could be harmful to the environment should be bunded.	No above ground storage tanks	Yes
All sumps should: • Be impermeable and resistant to stored materials; • Be subject to regular visual inspection and any contents pumped out or otherwise removed after checking for contamination; • Where not frequently inspected, be fitted with a high level probe and alarm, as appropriate; • Be subject to programmed engineering inspection (normally visual but extending to water testing where structural integrity is in doubt).	There are no sumps	Yes

3.4.10 It can be concluded that the measures proposed to control fugitive releases to water, land and groundwater will meet the requirements laid out in Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013.

3.5. Control of Emissions of Odour

3.5.1 Handling and storage of waste on-site has the potential to generate odour. Odorous emissions are considered in detail in the document referenced CRM 083 002 PE R 005 Environmental

Risk Assessment. An onsite Odour Management Plan has also been provided as part of this application (see document referenced CRM 083 002 PE R 008.)

3.5.2 Only a small quantity of wastes stored on site have the potential to generate odour. Activities are limited to sorting, shredding, bailing, and bulking which are not inherently odorous compared with higher risk waste treatment activities. All of these activities are carried out within the main reception building, which is kept under negative pressure to prevent fugitive emissions of odorous air from the buildings. The waste reception building will be fitted with fast acting roller shutter doors.

3.5.3 Exhaust gas emissions from the dryer have the potential to be odorous. Before release to air via a stack the gas will be treated firstly to remove dust in a baghouse filter then in the Regenerative Thermal Oxidiser (RTO). The RTO is specifically designed for odour control in difficult environments and odour destruction efficiency approaches 100%.

3.5.4 The emissions abatement system for the waste dryer, will also be used to treat odours from the waste reception and process building. Air extracted from the building will pass through the RTO where odours will be significantly reduced.

3.5.5 Whilst the dryer is operational approximately 60% of the time it will be operational during the hours in which waste is accepted into the facility thus ensuring its ability to combat odour when the doors are likely to be open.

3.5.6 Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013 references specific controls for minimisation of odorous emissions. The requirements set out in Section 2.2.6.5 have been compared with measures proposed by the Operator in Table 3.5.3 below:

Table 3.5.1: Indicative BAT requirements for control of odour

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
Where odour can be contained, for example within buildings, the Operator should maintain the containment and manage the operations to prevent its release at all times.	All potentially odorous activities will be carried out within the main reception building, which will be kept under negative pressure. Roller shutter doors will be fitted to the building Good housekeeping measures will be put in place. The Operator will adhere to the site's Odour Management Plan The Operator will implement an EMS with specific controls relating to minimising emissions of odour.	Yes
Where odour releases are expected to be acknowledged in the Permit, (i.e. contained and treated prior to discharge or discharged for atmospheric dispersion) requirements are detailed in Section	There is one potential point source of odour from the stack. However, before exhaust air is released from the stack it will treated in an RTO which is designed to have an odour destruction efficiency approaching 100%.	Yes

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
2.2.6 of the sector guidance in relation to modelling of odour and plant design.	Odour generating wastes comprise a small proportion of wastes accepted on-site. All potentially odorous wastes are handled in the main reception building only. An Odour Assessment has been carried out. A copy of this can be found in Appendix D.	
Where odour generating activities take place in the open, (or potentially odorous materials are stored outside) a high level of management control and use of best practice will be expected.	All potentially odorous wastes are handled in the main reception building only. Exhaust air from the drier is treated in an RTO prior to discharge which is designed to have an odour destruction efficiency approaching 100%. Baled RDF/SRF will be stored outside. Bales will be wrapped 5 times and regular inspections will be carried out to identify damaged bales. Any damaged bales will be brought back into the building to be re-wrapped.	Not applicable
Where an installation releases odours but has a low environmental impact by virtue of its remoteness from sensitive receptors, it is expected that the Operator will work towards achieving the standards described in this Note, but the timescales allowed to achieve this might be adjusted according to the perceived risk.	Not applicable.	Not applicable.
The objective is to prevent emissions of odorous releases that are offensive and detectable beyond the site boundary. This may be judged by the likelihood of complaints. However, the lack of complaint should not	Noted	Not applicable

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
necessarily imply the absence of an odour problem.		
Assessment of odour impact should cover a range of reasonably foreseeable odour generation and receptor exposure scenarios, including emergency events and the effect of different mitigation options.	This is presented in Document CRM 083 002 PE R 005 Environmental Risk Assessment	Yes
For complex installations, for example where there are a number of potential sources of odorous releases or where there is an extensive programme of improvements to bring odour under control, an odour management plan should be maintained	Nine Mile Point Waste Processing Facility is not a complex installation however an Odour Management Plan has been submitted as part of this application to address the small volume of potentially odorous wastes proposed to be accepted on-site. See document reference CRM 083 002 PE R 008 Odour Management Plan	Yes
Emphasis should be placed on pre-acceptance screening (see Section 2.1.1 on page 20) and the rejection of specific wastes, for example, mercaptans, low molecular weight amines, acrylates or other similarly highly odorous materials that are only suitable for acceptance under special handling requirements. These may include dedicated sealed handling areas with extraction to abatement.	Pre-acceptance measures meet the requirements of Section 2.1.1.	Yes
Scrubber liquors should be monitored to ensure optimum performance, i.e. correct pH, replenishment and replacement.	Not applicable as there are no scrubbing techniques employed on site.	Not applicable

3.5.7 It can be concluded that the measures proposed to control odour meet the requirements laid out in Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013.

3.6. Site Security

3.6.1 The site will be surrounded by a perimeter fence. The main reception building and cabin will be locked when not in use.

3.6.2 Access to the site will generally be restricted to the workforce other than site visitors during opening hours. The location of the cabin will ensure that any persons or vehicles entering the site will be identified prior to accessing the main waste activity and storage areas.

3.6.3 Unauthorised access will not be permitted at any time. The site will be locked and secured when closed.

3.6.4 CCTV will be used onsite both to deter unauthorised access to the site, and to capture any unpermitted activity.

3.7. Management

3.7.1 The approach to permitting and regulation under the Environmental Permitting Regulations 2016 (as amended 2019) by Natural Resources Wales relies heavily upon the use of Environmental Management Systems (EMS) as a driver for environmental compliance and improvement. In England, under the Environmental Permitting Regime, modern regulation is fundamentally driven by applying a risk based approach to activities, where operators are encouraged to implement suitable management systems with which to operate, and to implement self-regulation and reporting. An operator who holds a permit under the Environmental Permitting (England & Wales) Regulations 2016 (as amended 2019) is required to have an appropriate Environmental Management System in place.

3.7.2 Hazrem Environmental Ltd will be the operator of the proposed Facility. Once operations commence, the Operator will work towards obtaining ISO14001 certification within 12 months of plant commissioning (as required under IP4 of Table S1.3 – EPR/AB3695CH). The Quality, Health, Safety and Environmental Management System contents page is included in Appendix B which will be employed on-site from the outset of operations.

3.7.3 The Environmental Management System will meet Natural Resources Wales requirements as detailed in guidance document 'How to comply with your Environmental Permit'.

3.8. Waste Recovery or Disposal

3.8.1 The waste processing facility will divert approximately 85% of the waste throughput from landfill by either recycling or recovery of waste.

3.8.2 There will be a negligible volume of waste generated by on-site operations, and most of this will be used within the process.

3.9. Noise

3.9.1. *'Noise Impact Assessment September 2015 Land at Nine Mile Point Industrial Estate, Caerphilly'* has been carried out for the proposed facility, which is appended to the document CRM 083 002 PE R 005 Environmental Risk Assessment.

3.9.2. The assessment concluded that '…*subject to the implementation of the inherent design measures, noise from the proposed activities would be considered by the Standard to be an indication of the specific sound source having a low impact. As such it is considered that noise associated with the operation of the proposed facility, as defined within the scope of this report, would not be significantly detrimental to the noise climate of the area…'.*

3.9.3. Sector Guidance Note *'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*, Environment Agency 2013 references specific controls for minimisation of noise emissions in Section 2.9. These measures have been compared with measures proposed by the Operator in Table 3.9.1 below

Table 3.9.1: Indicative BAT Requirements for Control of Noise and Vibration

Requirement	Mitigation measures proposed by Operator	Meets requirements of TGN 5.06?
The Operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise (for example, bearings, air handling plant, the building fabric, and specific noise attenuation kit associated with plant or machinery).	Operator will employ basic good practice measures for the control of noise. Equipment associated with waste processing is covered by a maintenance contract and/or a programme of planned preventative maintenance.	Yes
The Operator should employ such other noise control techniques necessary to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, in the view of the Regulator. In particular, the Operator should justify where Rating Levels ($L_{Aeq,T}$) from the installation exceed the numerical value of the Background Sound Level ($L_{A90,T}$).	All noise generating equipment is located within the main process building, except for the dryer. A noise assessment has been undertaken for the site which confirms that the facility will have a low noise impact.	Yes
In some circumstances "creeping background" (i.e. creeping ambient) may be an issue.	All noise generating equipment is located within the main process building, except for the dryer. An amendment to the initial noise assessment was carried out due to a change in the size of the dryer. This amendment can be found in Appendix H of the Environmental Risk Assessment.	Yes
Further justification will be required should the resulting field rating level ($L_{AR,TR}$) exceed 50 dB by day and a facade rating level exceed 45 dB by night, with day being defined as 07:00 to 23:00 and night 23:00 to 07:00.	Please see noise assessment appended to the document CRM 083 002 PE R 005 Environmental Risk Assessment	Yes
Noise surveys, measurements, investigations (e.g. on sound power levels of individual items of plant) or modelling may be necessary for either new or for existing installations, depending upon the potential for noise problems. Where appropriate, the Operator should have a noise management plan as part of its management system.	Please see noise assessment appended to the document CRM 083 002 PE R 005 Environmental Risk Assessment	Yes

3.9.4. It can be concluded that the measures proposed to control odour meet the requirements laid out in Sector Guidance *Note 'S5.06: Guidance on the Recovery and Disposal of Hazardous and Non-Hazardous Waste*', Environment Agency 2013.

3.10. Accidents

3.10.1. An assessment of potential accidents and measures to reduce the risk of them occurring has been undertaken in line with *Environment Agency guidance: Risk assessments for your environmental permit, updated May 2018* and is included within the Environmental Risk Assessment (ERA) chapter of this permit application.

3.10.2. The site-specific ERA and Odour Management Plan (OMP) prepared identify the potential hazards posed by the facility under both normal and abnormal operating conditions. An assessment of each hazard identified has been evaluated and the potential risk and prevention measures described.

3.10.3. Operational procedures which identify the actions to be taken to minimise the potential causes of accidents, and the consequences in the event of an accident occurring will be implemented through the site's Environment Management System.

3.10.4. All personnel will be provided with suitable training to ensure they are familiar with the site's Environment Management System and their individual responsibilities in the event of an incident.

3.10.5. A standalone Accident Management Plan (AMP) will be prepared for the site prior to full commissioning and operations commencing on site. A copy of the AMP will be submitted to Natural Resources Wales for their approval.

3.11. Monitoring

3.11.1 Pont source emissions to air will be subject to a programme of monitoring as detailed in table 3.11.1 below. The emission point sampling locations meet the requirements stipulated in Environment Agency document M1: Technical Guidance Note (Monitoring): sampling requirements for stack emissions monitoring.

Table 3.11.1: Point Source Emissions to Air

Emission Point Ref.	Description	Monitoring Frequency	Monitoring Standard or Methodology
A1	Stack from dryer and RTO Point source emission to be referenced within Permit	Annually	BS EN 14792 (NOx) BS EN 15058 (CO) BE EN 14791 (SO_2) BE EN 13284-1 (particulate matter) ISO 12039/TGN M22

3.11.2 There will be no point source emissions to groundwater, land or water.

3.11.3 Surface water and clean roof water drainage which is directed to the existing surface waste drainage system on the industrial estate.

3.11.4 There will be one point source emission to sewer which will be controlled by the sewerage undertaker's consent limits.

3.11.5 Table 3.11.2 below shows emissions points for discharge of surface water from the facility.

Table 3.11.2: Point Source Emissions to Water and Land

Emission Point Ref.	Parameter	Emission Limit Value	Comments	Discharges to
SW1 Approximate NGR: ST 19178 91244	Sediment and oil	No Limits Proposed	Surface water run-off from the site and full retention interceptor and clean roof water, (inspected visually).	Storage crates then existing surface water drain as shown on CRM083 002 PE D 003

3.11.6 Routine odour monitoring will be carried out when the site is handling potentially odorous materials. Full details are provided in the OMP submitted with this application referenced CRM 083 002 PE R 008.

3.12. Decommissioning and Closure

3.12.1. The Operator will prepare a site closure plan in line with Natural Resources Wales Guidance in the event of cessation of operations on site. The Site Closure Plan will confirm how the site will be decommissioned to return it to a satisfactory state. Records will be maintained of the location of facilities and infrastructure, as well as the services and sub-surface structures installed during the operating phases of the facility.

3.12.2. De-commissioning will be in compliance with procedures outlined in the Site Closure Plan. If areas of deterioration during the operation of the site are identified these areas will be re-examined and the site will be returned to a satisfactory state as defined at the Permit application stage.

3.13. Operator Competency

3.13.1. As construction of the facility has not yet commenced, and the site isn't going to be operational for some time, the Technically Competent Manager for the site has not been confirmed. Hazrem would welcome the appointment of a Technically Competent Manager as a pre-operational condition. The Technically Competent Manager of the site will obtain WAMITAB Level 4 Medium Risk Operator Competence for Non-Hazardous Waste Treatment and Transfer.

4.0 RECORDS AND REPORTING

4.1. General Overview

4.1.1 The operator will ensure the following information is recorded:

- Any material changes to the site layout and operations;
- Site inspections by the operator or other body and any subsequent issues and corrective actions taken;
- Emergencies;
- Complaints and actions taken;
- Critical plant/equipment failure;
- A record of any rejection of waste;
- Records relating to pre-acceptance for cross-reference and verification at the waste acceptance stage;
- Technically competent manager – attendance on site;
- Any Incidents/accidents on site and actions taken;
- Security failures;
- Severe weather conditions;
- Waste accepted and dispatched from the site;
- Details of the quantities and types of waste stored on the site at any one time;
- Natural Resources Wales Compliance Assessment Reports (CARs); and
- Details of emissions reportable incidents in accordance with the Permit.

4.1.2 All records will be held in the site office and will be available on request. All records, which are required under the conditions of the Environmental Permit, will be maintained and kept secure from loss, damage or deterioration for a minimum period of 3 years. Any records held electronically will be backed up on a regular basis.

4.1.3 Electronic back up records will be held in the company's head office.

4.2. Reporting

4.2.1 As part of the sites Environment Management System, audits will be carried out on an annual basis to check that all activities are being carried out in line with the requirements of the Environmental Permit, Management Procedures and associated legislation.

4.2.2 A summary record of the waste types and quantities received and removed from the site will be made at the frequencies and in a format to be agreed in writing with Natural Resources Wales.

4.2.3 Records of internal site inspections by the Site Manager will be logged and available for inspection by Natural Resources Wales during routine audits.

APPENDICES

Appendix A – List of Permitted Waste Types

Nine Mile Point Waste Processing Facility - Waste types	
Waste Code	**Description**
02	**WASTE FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING**
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**
02 01 03	plant-tissue waste
02 01 04	waste plastics (except packaging)
02 01 07	wastes from forestry
02 07	**wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)**
02 07 02	wastes from spirits distillation
03	**WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD**
03 01	**wastes from wood processing and the production of panels and furniture**
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	**wastes from pulp, paper and cardboard production and processing**
03 03 01	waste bark and wood
03 03 07	mechanically separated rejects from pulping of wastepaper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation
04	**WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES**
04 02	**wastes from the textile industry**
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 15	wastes from finishing other than those mentioned in 04 02 14
04 02 21	wastes from unprocessed textile fibres
04 02 22	wastes from processed textile fibres
07	**WASTES FROM ORGANIC CHEMICAL PROCESSES**
07 02	**Wastes from the MFSU of plastics, synthetic rubber and man-made fibres**
07 02 13	waste plastic
09	**WASTES FROM THE PHOTOGRAPHIC INDUSTRY**
09 01	**wastes from the photographic industry**
09 01 08	photographic film and paper free of silver or silver compounds
15	**WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED**

Nine Mile Point Waste Processing Facility - Waste types	
Waste Code	**Description**
15 01	**packaging (including separately collected municipal packaging waste)**
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 09	textile packaging
15 02	**absorbents, filter materials, wiping cloths and protective clothing**
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
16	**WASTES NOT OTHERWISE SPECIFIED IN THE LIST**
16 01	**end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**
16 01 19	plastic
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 02	**wood, glass and plastic**
17 02 01	wood
17 02 03	plastic
17 09	**Other construction and demolition wastes**
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
18	**WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)**
18 01	**Wastes from natal care, diagnoses, treatment or prevention of disease in humans**
18 01 04	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTEWATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**

Nine Mile Point Waste Processing Facility - Waste types	
Waste Code	**Description**
19 02	**wastes from physio/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 03	Premixed wastes composed of only non-hazardous wastes
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09
19 04	**vitrified waste and wastes from vitrification**
19 04 01	vitrified waste
19 05	**19 05 wastes from aerobic treatment of solid wastes**
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 10	**Wastes from shredding of metal-containing wastes**
19 10 04	Fluff-light fraction and dust other than those mentioned in 19 10 03
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 01	paper and cardboard
19 12 04	plastic and rubber
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 01	**separately collected fractions (except 15 01)**
20 01 01	paper and cardboard
20 01 10	clothes
20 01 11	textiles
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 40	metals
20 02	**garden and park wastes (including cemetery waste)**

Nine Mile Point Waste Processing Facility - Waste types	
Waste Code	**Description**
20 02 03	other non-biodegradable waste
20 03	**other municipal wastes**
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	Street-cleaning residues
20 03 07	bulky waste

Appendix B – Contents Page of EMS

Contents

Appendix C - Process Flow

REFERENCE: COMBINED INPUT	
MATERIAL	%
FOOD WASTE	13.89%
GARDEN WASTE	2.34%
OTHER ORGANIC	0.54%
PAPER	18.12%
CARD	16.08%
GLASS	3.40%
FERROUS METALS	2.07%
NON-FERROUS METALS	0.76%
PLASTIC FILM	8.54%
DENSE PLASTICS	8.68%
TEXTILES	5.34%
WOOD	4.37%
WEEE	0.62%
HAZARDOUS	0.29%
SANITARY	1.93%
FURNITURE	0.40%
MATTRESSES	0.00%
MISC. COMBUSTIBLES	3.65%
MISC. NON-COMBUSTIBLE	3.45%
SOIL	0.06%
OTHER WASTE	1.55%
FINES	3.95%
TOTAL	100.00%

HAZREM- 32 TPH - RDF PREPARATION PLANT

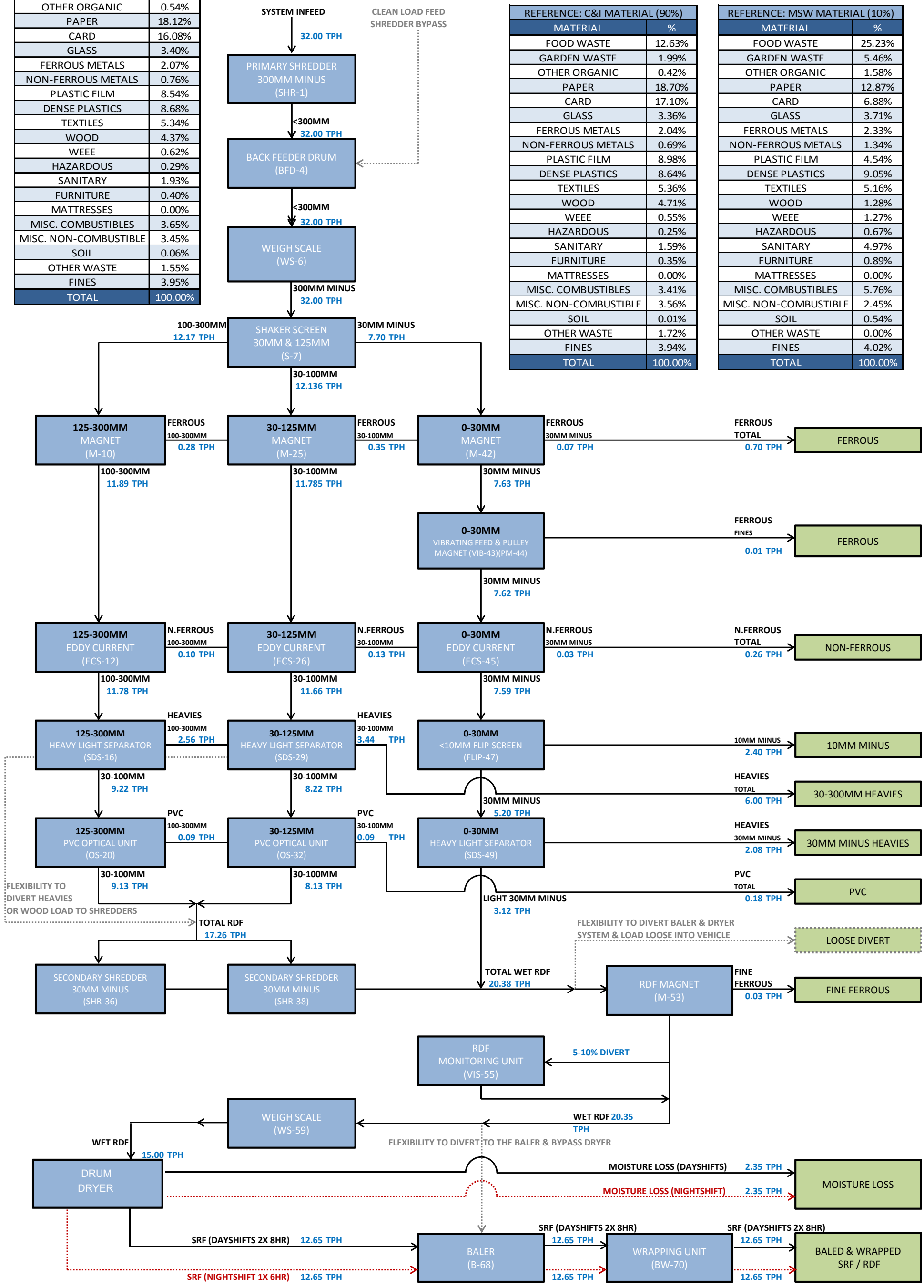
SCENARIO #1A - 90% C&I + 10% MSW

GENERAL NOTE: This flow diagram is based on the interpretation of the material breakdown values transferred with this Flow Chart. Any major modification to the incoming material breakdown will affect this flow chart as well as the mass balance and the system performances. System performances are related to sorters efficiency, material variations, equipment maintenance, etc.

MACHINEX

REFERENCE: C&I MATERIAL (90%)	
MATERIAL	%
FOOD WASTE	12.63%
GARDEN WASTE	1.99%
OTHER ORGANIC	0.42%
PAPER	18.70%
CARD	17.10%
GLASS	3.36%
FERROUS METALS	2.04%
NON-FERROUS METALS	0.69%
PLASTIC FILM	8.98%
DENSE PLASTICS	8.64%
TEXTILES	5.36%
WOOD	4.71%
WEEE	0.55%
HAZARDOUS	0.25%
SANITARY	1.59%
FURNITURE	0.35%
MATTRESSES	0.00%
MISC. COMBUSTIBLES	3.41%
MISC. NON-COMBUSTIBLE	3.56%
SOIL	0.01%
OTHER WASTE	1.72%
FINES	3.94%
TOTAL	100.00%

REFERENCE: MSW MATERIAL (10%)	
MATERIAL	%
FOOD WASTE	25.23%
GARDEN WASTE	5.46%
OTHER ORGANIC	1.58%
PAPER	12.87%
CARD	6.88%
GLASS	3.71%
FERROUS METALS	2.33%
NON-FERROUS METALS	1.34%
PLASTIC FILM	4.54%
DENSE PLASTICS	9.05%
TEXTILES	5.16%
WOOD	1.28%
WEEE	1.27%
HAZARDOUS	0.67%
SANITARY	4.97%
FURNITURE	0.89%
MATTRESSES	0.00%
MISC. COMBUSTIBLES	5.76%
MISC. NON-COMBUSTIBLE	2.45%
SOIL	0.54%
OTHER WASTE	0.00%
FINES	4.02%
TOTAL	100.00%



HAZREM- 32 TPH - RDF PREPARATION PLANT
SCENARIO #1A - 90% C&I + 10% MSW

GENERAL NOTE: This flow diagram is based on the interpretation of the material breakdown values transferred with this Flow Chart. Any major modification to the incoming material breakdown will affect this flow chart as well as the mass balance and the system performances. System performances are related to sorters efficiency, material variations, equipment maintenance, etc.

MACHINEX

SCENARIO #1A: 90% C&I + 10% MSW
OPERATION OF THE PLANT - **WITH DRYER**

IN-FEED TONNAGE	**32**	**TPH**
SRF GENERATED (DAY SHIFTS)	**12.65**	**TPH**
SRF GENERATED (NIGHT SHIFT)	**4.51**	**TPH**
DAYS OF OPERATION	5	PER WEEK
WEEKS OF OPERATION	52	PER YEAR
BANK HOLIDAYS	8	PER YEAR
TOTAL DAYS OF OPERATION	**252**	**DAYS PER YEAR**
DAY SHIFTS		
NUMBER OF SHIFTS	2	PER DAY
NUMBER OF HOURS (excl. break or cleaning)	8	PER SHIFT
CLEANING & MAINTENANCE BREAK	1	PER SHIFT
TOTAL HOURS OF OPERATION (DAY SHIFT)	**14**	**HOURS PER DAY**
NIGHT SHIFT		
NUMBER OF SHIFTS	1	PER DAY
NUMBER OF HOURS (excl. break or cleaning)	6	PER SHIFT
CLEANING & MAINTENANCE BREAK	1	PER SHIFT
TOTAL HOURS OF OPERATION (DAY SHIFT)	**5**	**HOURS PER DAY**
TOTAL HOURS OF OPERATION (DAY SHIFTS)	**3,528**	**HOURS PER YEAR**
TOTAL HOURS OF OPERATION (NIGHT SHIFT)	**1,260**	**HOURS PER YEAR**
PLANT AVAILIBILITY	90%	
TOTAL HOURS OF OPERATION (with availibility / DAY SHIFTS)	**3,175**	**HOURS PER YEAR**
TOTAL HOURS OF OPERATION (with availibility / NIGHT SHIFT)	**1,134**	**HOURS PER YEAR**
TONNAGE PROCESSED (TPA)	**101,606**	**TONNES PER YEAR**
SRF GENERATED - DAY SHIFTS (TPA)	**40,167**	**TONNES PER YEAR**
SRF GENERATED - NIGHT SHIFT (TPA)	**5,118**	**TONNES PER YEAR**
SRF GENERATED - TOTAL (TPA)	**45,285**	**TONNES PER YEAR**

EXPECTED FUEL SPECIFICATIONS
(WITH DRYER) - DAY SHIFTS

SPECIFICATION	UNIT	PRODUCED RDF SPECIFICATION
HOURLY RATE	T/H	12.65
DAILY RATE	T/D	159
YEARLY RATE	T/Y	40,167
MOISTURE	WT%	15.00
ASH, dry	WT%	13.98
GROSS CALORIFIC VALUE, as received	MJ/KG	18.12
NET CALORIFIC VALUE, as received	MJ/KG	16.89
PHYSICAL SIZE	MM	90% efficiency < 30mm x 30mm (in 3D) 98% efficiency < 50mm x 50mm (in 3D)
SULPHUR CONTENT, dry ash-free	WT%	0.19
CHLORINE CONTENT, dry ash-free	WT%	0.65
NITROGEN CONTENT, dry ash-free	WT%	1.06
CARBON CONTENT, dry ash-free	WT%	55.65
HYDROGEN CONTENT, dry ash-free	WT%	7.67
OXYGEN CONTENT, dry ash-free	WT%	34.77
BIOGENIC CONTENT, dry ash-free	WT%	67.91

EXPECTED FUEL SPECIFICATIONS
(WITH DRYER) - NIGHT SHIFTS

SPECIFICATION	UNIT	PRODUCED RDF SPECIFICATION
HOURLY RATE	T/H	4.51
DAILY RATE	T/D	20
YEARLY RATE	T/Y	5,118
MOISTURE	WT%	15.00
ASH, dry	WT%	13.98
GROSS CALORIFIC VALUE, as received	MJ/KG	18.12
NET CALORIFIC VALUE, as received	MJ/KG	16.89
PHYSICAL SIZE	MM	90% efficiency < 30mm x 30mm (in 3D) 98% efficiency < 50mm x 50mm (in 3D)
SULPHUR CONTENT, dry ash-free	WT%	0.19
CHLORINE CONTENT, dry ash-free	WT%	0.65
NITROGEN CONTENT, dry ash-free	WT%	1.06
CARBON CONTENT, dry ash-free	WT%	55.65
HYDROGEN CONTENT, dry ash-free	WT%	7.67
OXYGEN CONTENT, dry ash-free	WT%	34.77
BIOGENIC CONTENT, dry ash-free	WT%	67.91

SCENARIO #1A: 90% C&I + 10% MSW
OPERATION OF THE PLANT - **WITHOUT DRYER**

IN-FEED TONNAGE	**32**	**TPH**
RDF GENERATED	**20.35**	**TPH**
DAYS OF OPERATION	5	PER WEEK
WEEKS OF OPERATION	52	PER YEAR
BANK HOLIDAYS	8	PER YEAR
TOTAL DAYS OF OPERATION	**252**	**DAYS PER YEAR**
DAY SHIFTS		
NUMBER OF SHIFTS	2	PER DAY
NUMBER OF HOURS (excl. break or cleaning)	8	PER SHIFT
CLEANING & MAINTENANCE BREAK	1	PER SHIFT
TOTAL HOURS OF OPERATION (DAY SHIFT)	**14**	**HOURS PER DAY**
TOTAL HOURS OF OPERATION	**3,528**	**HOURS PER YEAR**
PLANT AVAILIBILITY	90%	
TOTAL HOURS OF OPERATION (with availibility)	**3,175**	**HOURS PER YEAR**
TONNAGE PROCESSED (TPA)	**101,606**	**TONNES PER YEAR**
RDF GENERATED	**64,621**	**TONNES PER YEAR**

EXPECTED FUEL SPECIFICATIONS
(WITHOUT DRYER)

SPECIFICATION	UNIT	PRODUCED RDF SPECIFICATION
HOURLY RATE	T/H	20.35
DAILY RATE	T/D	256
YEARLY RATE	T/Y	64,621
MOISTURE	WT%	26.46
ASH, dry	WT%	13.98
GROSS CALORIFIC VALUE, as received	MJ/KG	15.68
NET CALORIFIC VALUE, as received	MJ/KG	14.61
PHYSICAL SIZE	MM	90% efficiency < 30mm x 30mm (in 3D) 98% efficiency < 50mm x 50mm (in 3D)
SULPHUR CONTENT, dry ash-free	WT%	0.19
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HYDROGEN CONTENT, dry ash-free	WT%	7.67
OXYGEN CONTENT, dry ash-free	WT%	34.77
BIOGENIC CONTENT, dry ash-free	WT%	67.91

Appendix D – Odour Assessment

Enzygo specialise in a wide range of technical services:

Property and Sites
Waste and Mineral Planning
Flooding, Drainage and Hydrology
Landscape Architecture
Arboriculture
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Waste Technologies and Renewables
Waste Contract Procurement
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Ecology Services
Contaminated Land and Geotechnical
Traffic and Transportation
Planning Services

BRISTOL OFFICE
The Byre
Woodend Lane
Cromhall
Gloucestershire GL12 8AA
Tel: 01454 269 237

SHEFFIELD OFFICE
Samuel House
5 Fox Valley Way
Stocksbridge
Sheffield S36 2AA
Tel: 0114 321 5151

MANCHESTER OFFICE
First Floor
3 Hardman Square
Spinningfields
Manchester M3 3EB
Tel: 0161 413 6444

Please visit our website for more information.

enzygo.com

Appendix C – Process Flow

REFERENCE: COMBINED INPUT	
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GARDEN WASTE	2.34%
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DENSE PLASTICS	8.68%
TEXTILES	5.34%
WOOD	4.37%
WEEE	0.62%
HAZARDOUS	0.29%
SANITARY	1.93%
FURNITURE	0.40%
MATTRESSES	0.00%
MISC. COMBUSTIBLES	3.65%
MISC. NON-COMBUSTIBLE	3.45%
SOIL	0.06%
OTHER WASTE	1.55%
FINES	3.95%
TOTAL	100.00%

HAZREM- 32 TPH - RDF PREPARATION PLANT

SCENARIO #1A - 90% C&I + 10% MSW

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SANITARY	1.59%
FURNITURE	0.35%
MATTRESSES	0.00%
MISC. COMBUSTIBLES	3.41%
MISC. NON-COMBUSTIBLE	3.56%
SOIL	0.01%
OTHER WASTE	1.72%
FINES	3.94%
TOTAL	100.00%

REFERENCE: MSW MATERIAL (10%)	
MATERIAL	%
FOOD WASTE	25.23%
GARDEN WASTE	5.46%
OTHER ORGANIC	1.58%
PAPER	12.87%
CARD	6.88%
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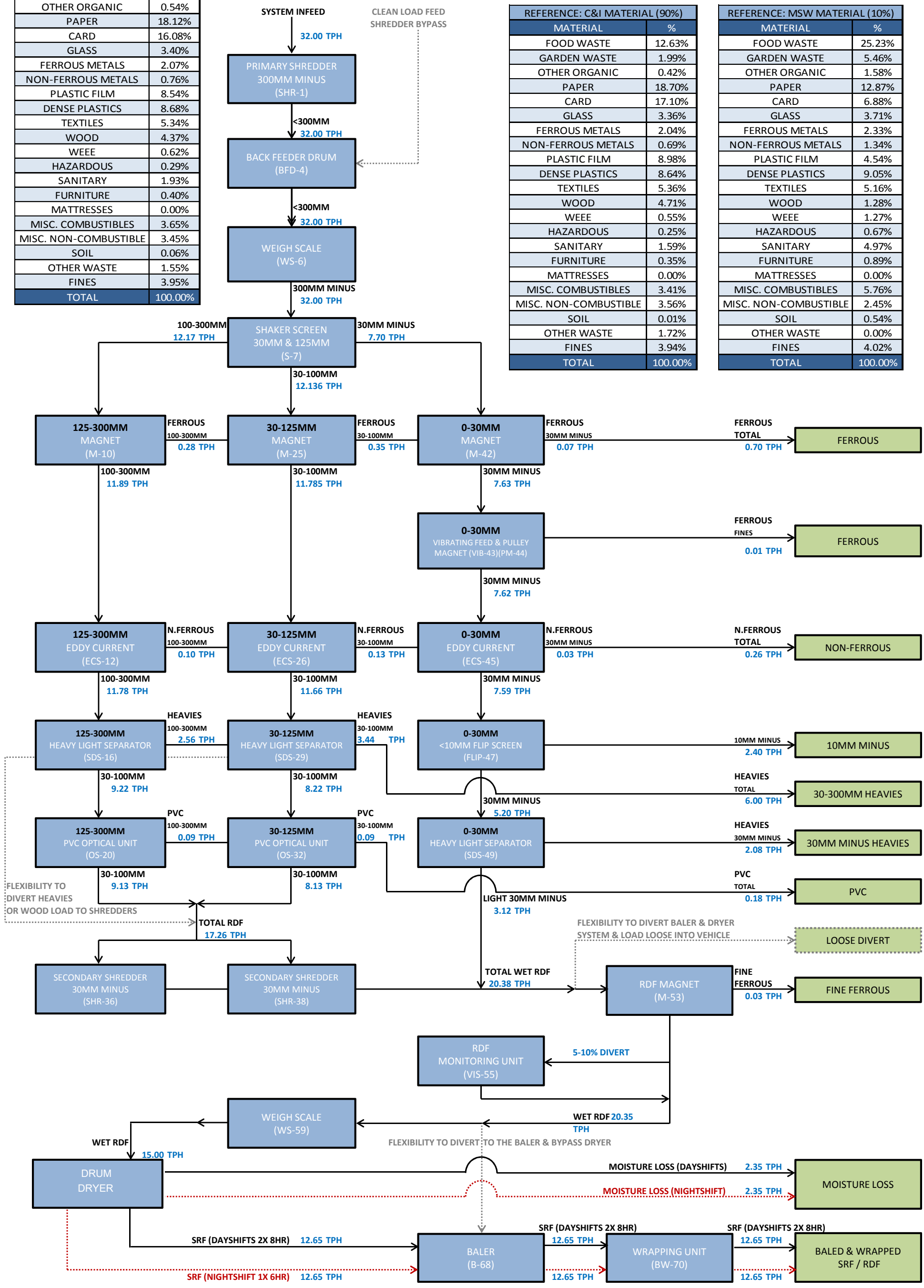

HAZREM- 32 TPH - RDF PREPARATION PLANT
SCENARIO #1A - 90% C&I + 10% MSW

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MACHINEX

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IN-FEED TONNAGE	**32**	**TPH**
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WEEKS OF OPERATION	52	PER YEAR
BANK HOLIDAYS	8	PER YEAR
TOTAL DAYS OF OPERATION	**252**	**DAYS PER YEAR**
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NUMBER OF SHIFTS	2	PER DAY
NUMBER OF HOURS (excl. break or cleaning)	8	PER SHIFT
CLEANING & MAINTENANCE BREAK	1	PER SHIFT
TOTAL HOURS OF OPERATION (DAY SHIFT)	**14**	**HOURS PER DAY**
NIGHT SHIFT		
NUMBER OF SHIFTS	1	PER DAY
NUMBER OF HOURS (excl. break or cleaning)	6	PER SHIFT
CLEANING & MAINTENANCE BREAK	1	PER SHIFT
TOTAL HOURS OF OPERATION (DAY SHIFT)	**5**	**HOURS PER DAY**
TOTAL HOURS OF OPERATION (DAY SHIFTS)	**3,528**	**HOURS PER YEAR**
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SRF GENERATED - DAY SHIFTS (TPA)	**40,167**	**TONNES PER YEAR**
SRF GENERATED - NIGHT SHIFT (TPA)	**5,118**	**TONNES PER YEAR**
SRF GENERATED - TOTAL (TPA)	**45,285**	**TONNES PER YEAR**

EXPECTED FUEL SPECIFICATIONS
(WITH DRYER) - DAY SHIFTS

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DAILY RATE	T/D	159
YEARLY RATE	T/Y	40,167
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NET CALORIFIC VALUE, as received	MJ/KG	16.89
PHYSICAL SIZE	MM	90% efficiency < 30mm x 30mm (in 3D) 98% efficiency < 50mm x 50mm (in 3D)
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NITROGEN CONTENT, dry ash-free	WT%	1.06
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HYDROGEN CONTENT, dry ash-free	WT%	7.67
OXYGEN CONTENT, dry ash-free	WT%	34.77
BIOGENIC CONTENT, dry ash-free	WT%	67.91

EXPECTED FUEL SPECIFICATIONS
(WITH DRYER) - NIGHT SHIFTS

SPECIFICATION	UNIT	PRODUCED RDF SPECIFICATION
HOURLY RATE	T/H	4.51
DAILY RATE	T/D	20
YEARLY RATE	T/Y	5,118
MOISTURE	WT%	15.00
ASH, dry	WT%	13.98
GROSS CALORIFIC VALUE, as received	MJ/KG	18.12
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SCENARIO #1A: 90% C&I + 10% MSW
OPERATION OF THE PLANT - **WITHOUT DRYER**

IN-FEED TONNAGE	**32**	**TPH**
RDF GENERATED	**20.35**	**TPH**
DAYS OF OPERATION	5	PER WEEK
WEEKS OF OPERATION	52	PER YEAR
BANK HOLIDAYS	8	PER YEAR
TOTAL DAYS OF OPERATION	**252**	**DAYS PER YEAR**
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TONNAGE PROCESSED (TPA)	**101,606**	**TONNES PER YEAR**
RDF GENERATED	**64,621**	**TONNES PER YEAR**

EXPECTED FUEL SPECIFICATIONS
(WITHOUT DRYER)

SPECIFICATION	UNIT	PRODUCED RDF SPECIFICATION
HOURLY RATE	T/H	20.35
DAILY RATE	T/D	256
YEARLY RATE	T/Y	64,621
MOISTURE	WT%	26.46
ASH, dry	WT%	13.98
GROSS CALORIFIC VALUE, as received	MJ/KG	15.68
NET CALORIFIC VALUE, as received	MJ/KG	14.61
PHYSICAL SIZE	MM	90% efficiency < 30mm x 30mm (in 3D) 98% efficiency < 50mm x 50mm (in 3D)
SULPHUR CONTENT, dry ash-free	WT%	0.19
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CARBON CONTENT, dry ash-free	WT%	55.65
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BRISTOL OFFICE
The Byre
Woodend Lane
Cromhall
Gloucestershire GL12 8AA
Tel: 01454 269 237

SHEFFIELD OFFICE
Samuel House
5 Fox Valley Way
Stocksbridge
Sheffield S36 2AA
Tel: 0114 321 5151

MANCHESTER OFFICE
First Floor
3 Hardman Square
Spinningfields
Manchester M3 3EB
Tel: 0161 413 6444

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