Bespoke Environmental Permit Application

NRS Bromsgrove Aggregates Limited

Sandy Lane Quarry
Sandy Lane
Wildmoor,
Bromsgrove,
Worcestershire,
B61 0QT.

WESTBURY ENVIRONMENTAL

PROVIDING SOLUTIONS, ENSURING COMPLIANCE

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk

Document Control Table

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1	Original Application Report	Sian Wilcox	Tracey Westbury	

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1. Introduction

1.1. Westbury Environmental Limited have been instructed to prepare this Environmental Permit Application on behalf NRS Bromsgrove Aggregates Limited.

1.2. This Environmental Permit application has been prepared for a new Bespoke Environmental Permit to allow the treatment of non-hazardous wastes and the deposit of waste for recovery, at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT.

1.3. The Environmental Permit will authorise the treatment of non-hazardous waste to produce soil, soil substitutes and aggregates, and the deposition of materials to restore the closed quarry to pre-extraction ground levels, under a deposit of waste for recovery (DfR) permit.

1.4. It is estimated that the restoration works will comprise the deposit of 975,000m^3 of material. It is projected that it will take an estimated 6 years to complete the proposed quarry restoration.

1.5. It is proposed that the amount of waste to be recycled is 250,000 tonnes per annum. The amount of waste that will be stored on Site at any one time will be no more than 60,000 tonnes.

1.6. The proposed Permit boundary is as shown on Drawing No. 20/022 001 Permit Boundary Plan. It should be noted that there is a minor discrepancy between this boundary and those shown in drawings within the ESSD report. Additional areas within the ESSD drawings relate to transport routes. It is considered that this subtle difference in boundaries within the ESSD report is minor, such that the drawings do not need revising.

1.7. The proposed layout of the Site is shown on the Drawing No. 20/022 004 Indicative Site Layout Plan. The operator has not yet determined precisely where the waste treatment operations will take place. This drawing assumes the worst-case scenario, with waste treatment activities placed near the closest sensitive receptors.

Pre-application advice

Waste Recovery Plan

1.8. A Waste Recovery Plan for the development was submitted to the Environment Agency in August 2021. The Waste Recovery Plan evidenced that the proposed works would fulfil the obligation to restore the quarry in accordance with the Review of Old Mineral Permissions (ROMP) permission.

1.9. The Environment Agency reviewed the original Waste Recovery Plan in January 2022 and considered that, as planning permission was not yet issued, they could not provide a conclusive response that the proposals constituted ‘recovery’. This pre-application correspondence is included with the Waste Recovery Plan, see Appendix 1, Waste Recovery Plan.

1.10. Planning permission is now issued (see planning permission section below), which obligates the Operator to restore the Site to the contours given on the approved Restoration Plan. The Waste Recovery Plan has been updated to reflect the obligation to restore the Site and details of the issued planning permission, see Appendix 1 Waste Recovery Plan.

Planning permission

1.11. Planning permission (reference 21/000029/CM) was granted on the 8 July 2022, see Appendix 1 Waste Recovery Plan.

1.12. The permission allows extraction of the remaining mineral followed by importation of restoration material to stabilise existing steep quarry slopes and restore the Site.

Application contents

1.13. The relevant Environment Agency forms for the bespoke Environmental Permit application (Part A, Part B2, Part B4 and Part F1) and other required information are included within this Environmental Permit application report.

1.14. The following supporting documents are enclosed:

- Environmental Setting and Site Design report
- Hydrogeological Risk Assessment
- Environmental Risk Assessment
- Gas Risk Assessment
- Stability Risk Assessment
- Dust Management Plan
- Waste Acceptance Procedures
- Site Condition Report.

1.15. In relation to application form Part A Question 5c, the details of the company directors and secretary are provided in Table 1.1.

Table 1.1: Details of company directors

Title	Name	Date of Birth
Director	Mark Ketcher	[redacted]
Director	Kieran Montgomery	[redacted]
Secretary	Lorraine Shirley	[redacted]

2. Non-technical summary

2.1. This permit application has been prepared for a new Bespoke Environmental Permit for a deposit of waste for recovery operation and waste recycling at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT.

2.2. Waste will be imported on to the Site for the production of recycled aggregates. The soils produced will be used in the restoration works.

2.3. In accordance with the permit the operator will deposit waste for the restoration of Sandy Lane Quarry (Western Void), following the extraction of sand and gravel.

2.4. The restoration will restore the Site back to pre-excavation ground levels while creating a landform that is congruous with the surrounding landscape. Surface water will flow westwards following restoration.

2.5. Once the Site has been restored, waste importation activities will cease. The Site will be restored in accordance with the requirements of the Permit. A permit surrender application will be prepared and submitted to the Environment Agency.

2.6. A site-specific risk assessment for both the waste deposit and recycling activity has been produced in line with Environment Agency guidance, see Appendix 2 Environmental Risk Assessment.

2.7. The Environmental Risk Assessment concludes that, with the exception of the Dust Management Plan no other management plans are considered to be required to mitigate risks from the proposed operations. The Environmental Risk Assessment concludes that there is a low risk of noise emissions from the Site from recycling and deposit of waste in the restoration works. The proposed plant and equipment are unlikely to generate significant noise. As such, it is considered that a Noise Impact Assessment and Noise Management Plan are not required to support this application.

2.8. Risk to controlled waters has been assessed by Hafren Water Limited. A copy of their detailed, site-specific Hydrogeological Risk Assessment (HRA) is provided as Appendix 3, Hydrogeological Risk Assessment. The HRA concludes that based on the conceptual site model, basal and sidewall barriers will be installed. The barriers will comprise cohesive materials capable of achieving $5x10^{-9}$m/s permeability or less at 1m thickness (or equivalent permeability at alternate thickness).

2.9. A schedule of groundwater monitoring is outlined in Section 3 of the HRA.

2.10. Stability at the Site during restoration will be managed by ongoing Construction Quality Validation. No other monitoring is deemed to be required, see Appendix 4 Stability Risk Assessment.

2.11. A Gas Risk Assessment has been produced, see Appendix 5 Gas Risk Assessment. This Gas Risk Assessment concludes that due to the nature of waste accepted, the Site poses a low risk of gas generation and therefore risk of migration.

2.12. Strict waste acceptance procedures will be applied on the Site to ensure that only the permitted waste types are accepted, see Appendix 6 Waste Acceptance Procedure.

2.13. A Dust Management Plan was prepared to detail how dust will be prevented and managed on Site, see Appendix 7 Dust Management Plan.

2.14. An Environmental Setting and Site Design (ESSD) report has been prepared by Hafren Water Limited, see Appendix 8 ESSD report.

2.15. Part 1 of a Site Condition Report has been produced for the Site. A copy of the Site Condition Report is provided in Appendix 9 Site Condition Report, Part 1.

2.16. Technical competence management (TCM) details are provided in Appendix 10, relevant certificates, contact details and other sites for which TCM is provided.

3. Proposed waste operations

3.1. The proposed waste activities for the Site are presented in Table 3.1.

Table 3.1: Description and limits of the proposed waste operations

Description of activities AR1	**Limits of activities**
R13: Storage of wastes pending the operations numbered R3 and R5 R3: recycling or reclamation of organic substances which are not used as solvents R10: Land treatment resulting in benefit to agriculture or ecological improvement R5: Recycling/reclamation of other inorganic materials	The use and associated secure storage of wastes listed in Table 3.2 for the purposes of the construction work and/or restoration, reclamation or improvement of land as detailed in the approved Waste Recovery Plan. In any event the total quantity of waste used shall not exceed the amount needed to complete the recovery operation to the final levels in the approved Waste Recovery Plan. Only the waste types specified in Table 3.2 that are specified in the approved Waste Recovery Plan shall be accepted. Such wastes shall only be used as specified in the approved Waste Recovery Plan. Topsoil or peat (waste types coded 17 05 04 and 20 02 02) and soil from cleaning and washing beet (waste coded 02 04 01) shall only be used for R10 activities and be limited to use in the top 50cm of the recovery activity and shall only be used to provide a growing medium. Storage of waste prior to use in the recovery activity shall be limited to 3 years.
Description of activities AR2	**Limits of activities**
R13: Storage of wastes pending the operations numbered R3 and R5. R3: recycling or reclamation of organic substances which are not used as solvents. R5: Recycling or reclamation of other inorganic materials.	Treatment of wastes listed in table 2.3 consisting only of sorting, separation, screening, crushing and blending of waste for recovery as a soil, soil substitute or aggregate. Secure storage of wastes listed in table 2.3 pending treatment. Storage of wastes listed in table 2.4 shall not exceed 10,000 tonnes in total at any one time. All other wastes stored shall not exceed 40,000 tonnes in total at any one time. No more than 75,000 tonnes of waste shall be treated per year. Treatment of slags and ashes for disposal shall not exceed 50 tonnes per day, or if for a mix of recovery and disposal shall not exceed 75 tonnes per day

3.2. Imported materials for permanent deposit will be subject to strict waste acceptance procedures to ensure that only suitable wastes are accepted and used in the restoration of the Site, see Appendix 6 Waste Acceptance Procedures.

3.3. The proposed List of Waste Codes to be accepted for the deposit of waste for recovery activity are presented in Table 3.2.

3.4. The proposed List of Waste Codes to be accepted for waste treatment activities are presented in Table 3.3.

Table 3.2: Proposed waste types to be used in waste deposit for recovery

Exclusions Wastes having any of the following characteristics shall not be accepted: • Consisting solely or mainly of dusts, powders, or loose fibers • Wastes that are in a form which is either sludge or liquid				
Source	**Sub-source**	**Waste code**	**Description**	**Additional restrictions**
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 01 wastes from mineral excavation	01 01 02	Wastes from mineral non- metalliferous excavation	Restricted to waste overburden and inter-burden only.
	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06	
		01 04 09	Waste sand and clays	
02 Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 04 wastes from sugar processing	02 04 01	Soil from cleaning and washing beet	Will be limited to placement in the upper 0.5m only
10 Wastes from thermal processes	10 12 wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)	
	10 13 waste from manufacture of cement, lime and plaster and articles and products made from them	10 13 14	Waste concrete	
17 Construction and demolition wastes	17 01 concrete, bricks, tiles and ceramics	17 01 01	Concrete	
		17 01 02	Bricks	
		17 01 03	Tiles and ceramics	
		17 01 07	Mixtures of concrete, bricks, tiles, and ceramics other than those mentioned in 17 01 06	Metal from reinforced concrete must have been removed.
	17 03 bituminous mixtures	17 03 02	Bituminous mixtures other than those mentioned in 17 03 01	Road planings only.
	17 05 soil stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03	Restricted to topsoil, peat, subsoil, and stones only. Topsoil and peat will be restricted to the top 0.5m only.
19 Wastes from waste management	19 12 wastes from the mechanical treatment	19 12 09	Minerals (for example sand, stones) only	Restricted to wastes from treatment of waste aggregates that

Source	Sub-source	Waste code	Description	Additional restrictions
facilities	of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified			are otherwise naturally occurring minerals. Does not include fines from treatment of any non-hazardous waste or gypsum from recovered plasterboard
		19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	Restricted to Crushed bricks, tiles, concrete, and ceramics. Including soils from the mechanical treatment of construction / demolition waste. Metal from reinforced concrete must be removed. Does not include gypsum from recovered plasterboard.
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02 garden and park wastes	20 02 02	Soils and stones	Restricted to topsoil, peat, subsoil and stones only. Topsoil and peat will be limited to placement in the upper 0.5m only.

3.5. The proposed List of Waste Codes to be accepted for the treatment of non-hazardous waste to produce soil, soil substitutes and aggregates are presented in Table 3.23.

Table 3.3a: Proposed waste types to be used for the production of aggregates

Exclusions
Wastes having any of the following characteristics shall not be accepted:
- Consisting solely or mainly of dusts, powders, or loose fibers
- Hazardous wastes
- Wastes in liquid form

Source	Sub-source	Waste code	Description
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06
		01 04 09	Waste sand and clays
02 Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 02 Wastes from preparation and processing of meat, fish and other foods of animal origin.	02 02 02	Shellfish shells from which the soft tissue or flesh has been removed only.

Source	Sub-source	Waste code	Description
10 Wastes from thermal processes	10 01 Wastes from power stations and other combustion plants	10 01 01	Bottom ash and slag only
		10 01 02	Pulverized fuel ash only
		10 01 15	Bottom ash and slag only from co-incineration other than those mentioned in 10 01 14
	10 11 Wastes from manufacture of glass and glass products	10 11 12	Clean glass other than those mentioned in 10 11 11
	10 12 Wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)
	10 13 wastes from manufacture of cement, lime and plaster products and articles and products made from them	10 13 14	Waste concrete only
15 Waste Packaging	15 01 Packaging	15 01 07	Clean glass only
17 Construction and demolition wastes (including excavated soil from contaminated sites)	17 01 concrete, bricks, tiles and ceramics	17 01 01	Concrete
		17 01 02	Bricks
		17 01 03	Tiles and ceramics
		17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
	17 02 wood, glass and plastic	17 02 02	Clean glass only
	17 03 bituminous mixtures, coal tar and tarred products	17 03 02	Road base and road planings (other than those containing coal tar) only
	17 05 soil (including excavated soil from contaminated sites) stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03
		17 05 06	Dredging spoil other than those mentioned in 17 05 05
		17 05 08	Track ballast other than those mentioned in 17 05 07

Source	Sub-source	Waste code	Description
	17 09 Other construction and demolition wastes	17 09 04	Mixtures if soil, bricks stones and concrete
19 Wastes from waste management facilities, off site waste water treatment plants, and preparation of water intended for human consumption/industrial waste	19 08 wastes from waste water treatment plants not otherwise specified	19 08 02	Washed sewage grit (waste from desanding) free from sewage contamination only
	19 12 Wastes from the mechanical treatment of wastes	19 12 05	Clean glass only
		19 12 09	Minerals (for example sand, stones)
		19 12 12	Treated bottom ash including IBA and slag other than that containing dangerous substances only
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 01 Separately collection fractions	20 01 02	Clean glass only
	20 02	20 02 02	Soils and stones

Table 3.3b: Proposed waste types to be used for the production of soil and soil substitutes

Exclusions
Wastes having any of the following characteristics shall not be accepted:
- Consisting solely or mainly of dusts, powders, or loose fibers
- Hazardous wastes
- Wastes in liquid form

Source	Sub-source	Waste code	Description
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 09	Waste sand and clays
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	Bark and cork
	03 03 Wastes from pulp, paper and cardboard production and processing	03 03 01	Bark and wood
10 Wastes from thermal processes	10 01 Wastes from power stations and other combustion plants	10 01 05	Gypsum (solid)
		10 01 07	Gypsum (sludge)

Source	Sub-source	Waste code	Description
17 Construction and demolition wastes (including excavated soil from contaminated sites)	17 05 soil (including excavated soil from contaminated sites) stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03
		17 05 06	Dredging spoil other than those mentioned in 17 05 05
	17 08 Gypsum-based construction material	17 08 02	Gypsum other than that mentioned in 17 08 01
	17 09 Other construction and demolition wastes	17 09 04	Mixtures of soil, bricks and concrete
19 Wastes from waste management facilities, off site waste water treatment plants, and preparation of water intended for human consumption/industrial waste	19 05 wastes from aerobic treatment of solid waste	19 05 03	Compost from source segregated biodegradable waste only
	19 09 wastes from the preparation of water intended for human consumption or water for industrial use	19 09 02	Sludges from water clarification
	19 12 Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified	19 12 09	Minerals (for example sand, stones)
	19 13 Wastes from soil and groundwater remediation	19 13 02	Solid wastes from soil remediation other than those mentioned in 19 13 01
		19 13 04	Sludges from soil remediation other than those mentioned in 19 13 03
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02 Garden and park wastes (including cemetery waste)	20 02 02	Soils and stones

4. Operating techniques

Environmental Management System

4.1. The Site will be operated in accordance with a written Environmental Management System (EMS).

4.2. A hard copy of the EMS will be kept on Site at all times. Each member of staff at the Site will have access to the EMS.

4.3. The EMS folder shall include a copy of the Environmental Permit and will contain the following sections:

EMS Report

The EMS report contains a description of the purpose and scope of the EMS, all Site details including the location of the Site, receptors located in close proximity to the Site boundary, waste storage, the plant and equipment that is used on the Site, the waste handling procedures carried out on Site, the Site security measures, information on the competence of the staff working on Site, roles and responsibilities for each member of staff and details for Site closure.

Each procedure within the EMS will specify who is responsible for implementing the required actions. The EMS will include a staff organogram which will show the roles and responsibilities of each staff member in relation to the activities covered by the permit.

An Environmental Training Procedure will be included in the EMS to ensure regular training on the EMS procedures is given to all site staff and is well documented.

The EMS will include a Complaints Procedure that will provide details for recording, investigating, and resolving complaints in regard to the permitted activities.

The Reviewing & Auditing Documentation Procedure included within the EMS will ensure regular checks are carried on the EMS documentation in order to assess whether the EMS implements the requirements of the permit and relevant environmental legislation. Any changes to the permit or site operations will be recorded within the EMS and the relevant EMS documents will be updated accordingly.

Records required by the permit e.g. waste transfer notes, chemical analysis, hazardous waste assessments, maintenance records, staff training records etc. will be kept on file within the EMS.

The Site will display a notice board at the site entrance which will include the following details:

- The permit holder's name – NRS Bromsgrove Aggregate Limited.
- An emergency contact name and telephone number.
- A statement that the site is permitted by the Environment Agency.
- The permit number.
- Environment Agency telephone number and the incident hotline telephone number.

Appendix A – Supporting documents

Site Condition Report

This is used to record the condition of land covered by the Environmental Permit at various stages during the life of the permit. Site Condition Report, Part 1 to record the condition of the land at the permit application stage is included as Appendix 9 of this application report.

Environmental Impacts and Controls Assessment

This assessment will provide information on the processes, activities and equipment on site, the potential emissions and impact that they may have on air, water, energy usage, waste disposal, land contamination, nuisance and resource consumption and how any identified impact may be controlled.

Environmental Accident Management Plan

This report will contain an assessment of the potential accidents that could occur on Site, details of the likelihood of each accident occurring, the preventative measures taken to reduce the risk of each accident

occurring, actions to be taken in the case of an accident on Site and an explanation on how to record any accidents that occur on Site. The types of accident included in this report include.

- Leaks or Spillages.
- Fire.
- Flooding (increasing risk from climate change).
- Unauthorised entry.
- Failure of plant and equipment.
- Cross-contamination.
- Failure of Services.

Flood Management Plan

This report will contain a brief description of the Site, its size, the key contacts to contact in an emergency, whether there are staff employed with any special needs, the locations of any gas, water and / or electric cut off points of Site and ways to keep all plant and computers / files safe in the event of a flood.

Residues Management Plan

This report documents the fate of all residues produced on Site.

Climate Change Risk Assessment

Assesses how the site may need to adapt for climate change, now and in the future.

Contingency Plan

Details the action to be taken in the event of extreme events.

Dust Management Plan

This report provides details on managing the potential causes of dust at the Site, the dust suppression measures and dust monitoring methods. It includes critical information on the storage requirements for the Site and managing dust emissions.

Risk Assessments

Copies of the risk assessments prepared in support of the permit application, will be kept with the EMS, including:

- Environmental Risk Assessment
- Stability Risk Assessment
- Hydrogeological Risk Assessment

Appendix B - Authorisations

A copy of the permit and EA Registrations for the Site will be found in the EMS.

Appendix C - Procedures and Forms

The EMS contains a number of procedures that cover its implementation, waste acceptance and storage, site management, environmental protection, environmental monitoring, emergency provisions and reporting. Records to be produced in accordance with these procedures are provided in the EMS as forms. The completed forms provide records that evidence the implementation of the EMS. The following list details procedures that are included in the EMS.

Implementation

- Environmental training.
- Roles and responsibilities.
- Reviewing and auditing documentation.
- Compliance with legal and other requirements.

Waste Acceptance & Storage

- Waste acceptance.
- Waste classification.
- Waste rejection.
- Waste storage and handling.

Site Management

- Fuel and oil storage.
- Refuelling of plant / equipment
- Housekeeping, litter, pest and vermin control.
- Wheel washing.
- Site security.
- Removal of waste.

Environmental Protection

- Dust, fibres and particulates.
- Mud and debris.
- Noise control.
- Odour control.
- Surface water management.

Maintenance

The Maintenance Procedure will ensure inspections of infrastructure, plant and equipment will be carried out on a daily, weekly, and monthly basis. This procedure will also specify when planned preventative maintenance should be carried out on each item of plant and equipment located on the Site.

- Planned preventative maintenance
- Inspection Checklists.

Emergency Provisions

The EMS will include emergency procedures to ensure contingency measures are implemented in the event of a utility / equipment failure or a flood on the Site. The Flood Management Procedure will account for the potential increase in the risk of flooding at the Site due to climate change.

- Environmental accidents / incidents / complaints.
- Near-miss reporting.
- Spill response.
- Flood management.
- Utility / equipment failure.
- Fire prevention.

Reporting

- Waste returns.
- Notifications to the Environment Agency.

(This list is not exhaustive)

Drawings

The drawings included in the EMS include:

- Permit Boundary Plan: Outlines the Permitted boundary (green line).
- Site Layout Plan: Denotes areas of waste storage and handling, storage for hazardous materials (fuel and oil), location of spill kits, and access for emergency services.
- Sensitive Receptors Plan: Shows nearby receptors including residential, commercial receptors, water courses and protected habitats within a given radius of the Site.

Application Forms

Part A

Application for an environmental permit Part A – About you

You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

You can apply online for Waste standard rules environmental permits, bespoke waste permits and bespoke Medium combustion plant permits

Apply online for an environmental permit.

Please read through this form and the guidance notes that came with it.

The form can be:

1) **saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.**
2) **printed off and filled in by hand. Please write clearly in the answer spaces.**

Note: if you believe including information on a public register would not be in the interests of national security you must enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual	☐ Now go to section 2 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
An organisation of individuals (for example, a partnership)	☐ Now go to section 3 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
A public body	☐ Now go to section 4
A registered company or other corporate body	☑ Now go to section 5 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Now go to section 6

3 Applications from an organisation of individuals or charity

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation or charity

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to question 3c or section 6

3c Details of charity

Full name of charity

This should be the full name of the legal entity not any trading name.

3d Company registration number

If you are registered with Companies House please tell us your registration number

3e Charity Commission number

If you are registered with the Charity Commission please tell us your registration number

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

NRS Bromsgrove Aggregates Limited

5b Company registration number

12564860

Date of registration (DD/MM/YYYY)

20/04/2020

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

5 Applications from companies or corporate bodies, continued

5c Please give details of the directors

If relevant, provide details of other directors and company secretary, if there is one, on a separate sheet and tell us the reference you have given this sheet.

Document reference: See Application Report Table 1.1.

Details of company secretary (if relevant) and director/s

Title (Mr, Mrs, Miss and so on):

First name:

Last name:

Title (Mr, Mrs, Miss and so on):

First name:

Last name:

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name

Title (Mr, Mrs, Miss and so on): Ms

First name: Lorraine

Last name: Shirley

Address: NRS House, site 7
Meriden Park
Cornets End Lane, Meriden
United Kingdom

Postcode: CV7 7LG

Contact numbers, including the area code

Phone: 01827370058

Fax:

Mobile:

Email: Lorraine.s@nrswastecare.com

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference:

6b Main UK business address (if different from above)

Contact name

Title (Mr, Mrs, Miss and so on):

First name:

Last name:

Address:

Postcode:

6 Your address, continued

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

It will help us if there is someone we can contact if we have any questions about your application. The person you name should have the authority to act on your behalf.

Please add a second contact on a separate sheet if this person is not always available.

Document reference of this separate sheet

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on) Ms

First name Tracey

Last name Westbury

Address Agriculture House

Southwater Way

Telford

Postcode TF3 4NR

Contact numbers, including the area code

Phone 01952879705

Fax

Mobile

Email info@westburyenv.co.uk

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7 Contact details, continued

7c Who can we contact about your billing or invoice?

Note: Please provide the name and address that all invoices should be sent to for your subsistence fees.

As in question 7a ☐

As in question 7b ☐

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on): Ms

First name: Lorraine

Last name: Shirley

Address: NR House, Site 7
Meriden Park
Cornets End Lane
Meriden

Postcode: CV7 7LG

Contact numbers, including the area code

Phone: 01827370058

Fax:

Mobile:

Email: lorraine.s@nrswastecare.com

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it. More information on how to do this is available at: www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application

For how many copies to send see the guidance note on part A.

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

For flood risk activity permits send 1 copy only to enquiries@environment-agency.gov.uk or to the local Environment Agency office for where the work is proposed to be carried out.

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Appendix 1 – Date of birth information for installation and waste activities (applications for a new permit or transferring a permit) only

Date of birth information in this appendix will not be put onto our Public Register

Are you applying as an individual, an organisation of individuals (for example, a partnership) or a company (this includes Limited Liability Partnerships)?

An individual	☐ Now go to 2
An organisation of individuals (for example, a partnership)	☐ Now go to 3
A registered company or other corporate body	☑ Now go to 4

2 Applications from an individual

Please give us the following details

Name

Date of birth (DD/MM/YY)

3 Applications from an organisation of individuals or charity

Details of the organisation or charity

If you are an organisation of individuals, please give the date of birth details of the main representative below. If relevant, provide details of other members on a separate sheet and tell us the document reference you have given this sheet.

Name

Date of birth (DD/MM/YY)

Document reference

4 Applications from companies or corporate bodies

Name of the company: NRS Bromsgrove Aggregates Limited

Please give the date of birth details for all directors and company secretary if there is one. If relevant, provide those details of other directors on a separate sheet and tell us the document reference you have given this sheet.

Details of company secretary (if relevant) and director/s

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Document reference: Application Report Table 1.1

Application Forms

Part B2

Application for an environmental permit
Part B2 – General – new bespoke permit

Environment Agency

You will need to use an Adobe Acrobat product to complete this form. The form may not work properly if you use a different pdf reader, such as the one built-in to your internet browser.

Fill in this part of the form together with parts A and F1 if you are applying for a new bespoke permit. You also need to fill in part B2.5, B3, B4, B5, B6, or B7 (this depends on what activities you are applying for).

Please check that this is the latest version of the form available from our website.

Please read through this form and the accompanying Part B2 guidance notes(see **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102174/Guidance-app-for-an-environmental-permit-part-b2-general-new-bespoke-permit.pdf**).

The form can be:

1) saved onto a computer and then filled in.

2) printed off and filled in by hand. Please write clearly in the answer spaces

It should take less than two hours to fill in this part of the application form.

Contents

1 About the permit

1a Discussions before your application

If you have had discussions with us before your application, including having requested to submit your application in stages, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet(s).

Permit or document reference

N/A

1 About the permit, continued

1b Is the permit for a site or for mobile plant?

☐ Mobile plant Now go to **question 1c**

☑ Site Now go to **section 2**

Note: The term 'mobile plant' does not include mobile sheep dipping units.

Mobile plant only

1c Have we told you during pre-application discussions that we believe that a mobile permit is suitable for your activity?

☐ No

☐ Yes

1d Have there been any changes to your proposal since this discussion?

☐ No Now go to **section 3**

☐ Yes You should send us a description of the activity you want to carry out, highlighting the changes you have made since our pre-application discussions

Document reference

Now go to **section 3**

2 About the site (excludes mobile plant)

2a What is the site name, address, postcode and national grid reference?

Site name

Sandy Lane Quarry

Address

Sandy Lane
Wildmoor
Bromsgrove
Worcestershire

Postcode

B61 0QT

National grid reference for the middle of the site, or for water quality/groundwater activities, the discharge point (for example, ST 12345 67890).

SO 94985 76324

2 About the site (excludes mobile plant), continued

2b What type of regulated facility are you applying for?

Note: if you are applying for more than one regulated facility then go to 2c.

- ☐ Installation
- ☑ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

What is the national grid reference for the regulated facility (if only one)?
(**See the guidance notes on part B2**.)

- ☑ As in 2a above
- ☐ Different from that in 2a Please fill in the national grid reference below

National grid reference for the regulated facility

Now go to **question 2d**

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

See the guidance notes on part B2.

Regulated facility 1

National grid reference

SO 94985 76324

What is the regulated facility type?

- ☐ Installation
- ☑ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

2 About the site (excludes mobile plant), continued

Regulated facility 2

National grid reference

What is the regulated facility type?

- ☐ Installation
- ☐ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

Use several copies of this page or separate sheets if you have a long list of regulated facilities. Send them to us with your application form. Tell us below the reference you have given these extra sheets.

Document reference

Now go to **question 2d**

2d Low impact installations (installations only)

Are any of the regulated facilities low impact installations?

- ☑ No
- ☐ Yes If yes, tell us how you meet the conditions for a low impact installation (**see the guidance notes on part B2** – Appendix 1).

Document reference

- ☐ Tick the box to confirm you have filled in the low impact installation checklist in **appendix 1** for each regulated facility

2e Treating batteries

Are you planning to treat batteries? (**See the guidance notes on part B2**.)

- ☑ No
- ☐ Yes Tell us how you will do this, send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2 About the site (excludes mobile plant), continued

2f Ship recycling

Is your activity covered by the Ship Recycling Regulations 2015? (**See the guidance notes on part B2**.)

☑ No

☐ Yes Tell us how you will do this. Please send us a copy of your explanation and your facility recycling plan, and tell us below the reference numbers you have given these documents

Document reference for the explanation

Document reference for the facility recycling plan

2g Multi-operator installation

If the site is a multi-operator site (that is there is more than one operator of the installation) then fill in the table below the application reference for each of the other permits.

Table 1 – Other permit application references

3 Your ability as an operator

If you are only applying for a standalone water discharge or for a groundwater activity, you only have to fill in **question 3d**.

3a Relevant offences

Applies to all except standalone surface water discharges and groundwater discharges (**see the guidance notes on part B2**).

Have you, or any other relevant person, been convicted of any relevant offence? (see https://www.gov.uk/government/publications/relevant-conviction-guidance-for-permit-applications-for-waste-activities-and-installations-only)

☑ No Now go to **question 3b**

☐ Yes Please give details below

3 Your ability as an operator, continued

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position held at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YYYY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Now go to **question 3b**

Please also complete the details in **Appendix 2**.

3b Technical ability

Relevant waste operations only (see the guidance notes on part B2).

Please indicate which of the two schemes you are using to demonstrate you are technically competent to operate your facility and the evidence you have enclosed to demonstrate this.

ESA/EU skills

Please select one of the following:

☐ I have enclosed a copy of the current Competence Management System certificate

or

☐ We will have a certified Competence Management System within 12 months and have enclosed evidence of the contract with an accredited certification body

3 Your ability as an operator, continued

CIWM/WAMITAB scheme

Your answers below must relate to the person(s) providing technically competent management when the permitted activities start.

Please select **one** of the following:

- I have enclosed a copy of:

  ☑ the relevant qualification certificate/s

  or

  ☐ evidence of deemed competence

  or

  ☐ Environment Agency assessment

  or

  ☐ evidence of nominated manager status under the transitional provisions for previously exempt activities

  and, if deemed competent or Agency-assessed, or nominated manager, or if the original qualification is over two years old:

  ☐ I have enclosed a copy of the relevant current continuing competence certificate/s

- ☐ The technically competent manager will complete their qualification within four weeks of starting the permitted activities and I have enclosed evidence of their registration with WAMITAB or their EPOC booking as appropriate

- **For medium- and high-risk tier activities other than landfill**

  ☐ The technically competent manager will complete the qualification within 12 months and I have enclosed evidence of their registration with WAMITAB and, where relevant, EPOC booking. I understand they must complete either four specified units of the relevant qualification or an EPOC within four weeks of the permitted activities commencing

For each technically competent manager please give the following information. If necessary, use a separate sheet to give us these details and tell us below the document reference you have given the extra sheet.

Title (Mr, Mrs, Miss and so on)

Mr

First name

Reece

Last name

Townend

Phone

Mobile

07572051999

Email

reece.t@nrswastecare.com

3 Your ability as an operator, continued

Please provide the environmental permit number/s and site address for all other waste operations, (**see part B2 guidance notes**), that the proposed technically competent manager provides technical competence for, including permits held by other operators. Continue on a separate sheet as required.

Permit number	Site address	Postcode
	please see doc below	

Document reference

Application Report Appendix 10 TCM Evidence

Now go to **question 3c**

Please also complete the details in **Appendix 2**.

3c Finances

Installations, waste operations and mining waste operations only.

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

Do you, or any relevant person, or a company in which you (or they) (or any relevant person) were a relevant person, have current or past bankruptcy or insolvency proceedings against you?

☑ No

☐ Yes Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed

We may want to contact a credit reference agency for a report about your business's finances.

See **Environmental permits privacy notice - GOV.UK (www.gov.uk)** for how we use your personal information to support environmental permitting.

3 Your ability as an operator, continued

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

- ☐ Renewable bonds
- ☐ Cash deposits with the Environment Agency
- ☐ Other – provide comprehensive details

Document reference

Provide a cost profile and expenditure plan of your estimated costs throughout the aftercare period of your site.

Document plan reference

Now go to **question 3d**

3d Management systems (all)

You must have an effective, written management system in place that identifies and reduces the risk of pollution. You may show this by using a certified scheme or your own system.

Your permit requires you (as the operator) to ensure that you manage and operate your activities in accordance with a written management system.

You need to be able to explain what happens at each site and which parts of the overall management system apply. For example, at some sites you may need to show you are carrying out additional measures to prevent pollution because they are nearer to sensitive locations than others.

For waste and installation permits only: your management system must also explain your resilience to climate change.

You can find guidance on management systems on our website at **https://www.gov.uk/guidance/develop-a-management-system-environmental-permits**

- ☐ **Tick this box to confirm that you have read the guidance and that your management system will meet our requirements**

What management system will you provide for your regulated facility?

- ☐ ISO 14001
- ☐ BS 8555 (Phases 1–5)
- ☐ BS EN ISO 14005:2019
- ☐ Green dragon
- ☑ Own management system
- ☐ EMAS Global
- ☐ Other

Please send us a summary of the management system you are using and a copy of your accreditation (if applicable) with your application.

Document reference/s

Application Report Section 4

4 Consultation

Fill in 4a to 4c for installations and waste operations and 4d for installations only.

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

☑ No

☐ Yes Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

☑ No

☐ Yes Please name the harbour authority

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

☑ No

☐ Yes Please name the fisheries committee

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

☐ No

☐ Yes

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 2015, or a safety report is needed under regulation 7 of those Regulations?

☐ No

☐ Yes

5 Supporting information

5a Provide a plan or plans for the site

But not any mobile plant

Clearly mark the site boundary or discharge point, or both. The site plan must be legible at A4 size, drawn to scale and include a scale bar.

5 Supporting information, continued

Also include site drainage plans, site layout plans, and plant design drawings/process flow diagrams (as required). (**See the guidance notes on part B2**.)

Document reference/s of the plans

20/022 001 Permit Boundary Plan

5b Provide the relevant sections of a site condition/baseline report if this applies

See the guidance notes on part B2

Document reference of the report

Application Report Appendix 9: SCR

☐ If you are applying for an installation, tick the box to confirm that you have sent in a baseline report

5c Provide a non-technical summary of your application

See the guidance notes on part B2 for what needs to be included.

Document reference of the summary

Application Report Section 2

5d Are you applying for an activity that includes the storage of combustible wastes?

This applies to all activities excluding standalone water and groundwater discharges.

☑ No

☐ Yes Provide a fire prevention plan (**see the guidance notes on part B2**).

Document reference of the plan

6 Environmental risk assessment

Provide an assessment of the risks each of your proposed regulated facilities poses to the environment. The risk assessment must follow the methodology set out in 'Risk assessments for your environmental permit' at **Risk assessments for your environmental permit – GOV.UK (www.gov.uk)** or an equivalent method.

For air dispersion modelling see: **Environmental permitting: air dispersion modelling reports – GOV.UK (www.gov.uk)**

Document reference(s) for the assessments, including modelling reports and files where applicable

Application Report Appendix 2

7 How to contact us

If you have difficulty using this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

7 How to contact us, continued

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

☐ Yes please

☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

☐ No

☐ Yes

Amount received (£)

Appendix 1 – Low impact installation checklist

Low impact installation criterion (see the Part B2 guidance notes)	Section of supporting document that shows how your proposed activity meets the LII criterion	Do you meet LII criterion?
A – Management techniques		☐ Yes ☐ No
B – Wastewater		☐ Yes ☐ No
C – Abatement systems/ releases to air		☐ Yes ☐ No
D – Emissions to groundwater		☐ Yes ☐ No
E – Waste production		☐ Yes ☐ No
F – Energy consumption		☐ Yes ☐ No
G – Accident prevention		☐ Yes ☐ No
H – Noise		☐ Yes ☐ No
I – Emissions of polluting substances		☐ Yes ☐ No
J – Odours		☐ Yes ☐ No
K – Compliance history		☐ Yes ☐ No

If you answered 'No' to any of the questions above, your installation cannot be considered as a low impact installation.

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

Date of birth information in this appendix will not be put onto our Public Register. Continue on a separate sheet if necessary

1. Relevant Offences – date of birth information for relevant persons(s)

Please give us the following details if you have answered 'Yes' to question 3a

Name

Date of birth (DD/MM/YYYY)

2. Technical ability – date of birth information for technically competent manager(s)

Please give us the following details (relevant waste operations only)

Name

Reece Townend

Date of birth (DD/MM/YYYY)

[redacted]

Application Forms

Part B4

Application for an environmental permit
Part B4 – New bespoke waste operation permit

Environment Agency

Fill in this part of the form, together with parts A, B2 and F1, if you are applying for a new bespoke permit for a waste operation. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it.

You can apply online for waste bespoke environmental permits.

Apply online for an environmental permit.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What waste operations are you applying for?

Fill in Table 1a with details of what you are applying for.

Fill in a separate table for each waste operation you are applying for. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the extra sheet.

Document reference: N/A

Types of waste accepted

For each line in Table 1a, fill in a separate document to list those wastes you will accept on the site for that operation, giving the List of Wastes catalogue code (search for 'Technical guidance on how to assess and classify waste' at www.gov.uk/government/organisations/environment-agency). If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

1 What waste operations are you applying for?, continued

Table 1a – Waste operations which do not form part of an installation

Name of the waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 1)	Non-hazardous waste treatment capacity (if this applies) (See note 1)
Add extra rows if you need them. If you do not have enough room, go to the line below or send a separate document and give us the document reference here	Use the description from the guidance. Include any extra detail that you think would help to accurately describe what you want to do			
Sandy Lane Quarry restoration	Deposit of waste for recovery	R13, R3, R5, R10		975,000.00
Sandy Lane Quarry	Treatment of waste to produce soil, soil substitutes and aggregates	R13, R3, R5		
For all waste operations	Total storage capacity (see note 2)			60,000.00
	Annual throughput (tonnes each year)			

Notes

1 By 'capacity', we mean:

- the total landfill capacity (cubic metres) for landfills
- the total treatment capacity (tonnes each day) for waste treatment
- the total storage capacity (tonnes) for waste-storage operations

2 By 'total storage capacity', we mean the maximum amount of waste in tonnes you store on the site at any one time.

1 What waste operations are you applying to vary?, continued

Please provide the document reference. You can use Table 1b as a template.

If you want to accept any waste with a code ending in 99, you must provide more information and a full description of the waste in the document, (for example, detailing the source, nature and composition of the waste). Where you only want to receive specific wastes within a waste code you can provide further details of the waste you want to receive. Where a waste is dual coded you should use both codes for the waste.

Document reference: n/a

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of the waste
Example	Example
02 01 08*	Agrochemical waste containing hazardous substances
18 01 03*	Infectious clinical waste, not contaminated with chemicals or medicines – human healthcare (may contain sharps) for alternative treatment
17 05 03*/17 06 05*	Non-hazardous soil from construction or demolition contaminated with fragments of asbestos cement sheet

1c Deposit for recovery purposes (see Appendix 4 and the guidance notes on part B4)

Are you applying for a waste recovery activity involving the permanent deposit on waste on land for construction or land reclamation (including landfill restoration)?

No ☐ Go to section 2

Yes ☑

Are you applying for an inert landfill permit that includes a restoration activity using waste?

No ☑ Go to section 2

Yes ☐ Please send us a copy of your restoration plan in accordance with our guidance at https://www.gov.uk/guidance/landfill-operators-environmental-permits/restore-your-landfill-site

Have we advised you during pre-application discussions that we believe the activity is waste recovery?

No ☑ Go to section 2

Yes ☐

Have there been any changes to your proposal since the discussions?

No ☑

Yes ☐

Please send us a copy of your waste recovery plan that complies with our guidance at https://www.gov.uk/guidance/waste-recovery-plans-and-permits. You need to highlight any changes you have made since your pre-application discussions. Also give us the reference number of the document with your justification.

Please note that there is an additional charge for the assessment of a waste recovery plan that must be submitted as part of this application. For the charge see https://www.gov.uk/topic/environmental-management/environmental-permits.

Document reference: Application Report Appendix 1 WRP

2 Point source emissions to air, water and land

Fill in Table 2 below with details of the point source emissions that result from the operating techniques at each of your waste operations.

Fill in one table for each waste operation.

Table 2 – Emissions

Name of the waste operation	Sandy Lane Quarry Restoration			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each waste operation you refer to in Table 1a above and list the 'appropriate measures' you are planning to use. If you are using the standards set out in the relevant technical guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.

You must justify your decisions in a separate document if:

- there is no technical standard
- the technical guidance provides a choice of standards, or
- you plan to use another standard

This justification could include a reference to the Environmental Risk Assessment provided in part B2 of the application form.

Table 3a should summarise:

- the operations undertaken
- the measures you will use to control the emissions from your process, as identified in your risk assessment or the relevant technical guidance
- how you will meet other standards set out in the relevant technical guidance

Table 3a – Technical standards

Fill in a separate table for each waste operation.

Waste operation	Sandy Lane Quarry Restoration	
Description of the waste operation Add extra rows if you need them	Appropriate measure (TGN reference)	Document reference (if appropriate)
Deposit for recovery	Waste recovery plans and deposit for recovery per	https://www.gov.uk/government/pu
Treatment of waste to produce soil, soil substit	Non-hazardous and inert waste: appropriate meas	https://www.gov.uk/guidance/non-l
	Develop a management system: environmental pe	https://www.gov.uk/guidance/deve

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken. Give the document references you use for each plan, diagram and description.

Document reference: See Application Report

3b General requirements

Fill in a separate table for each waste operation.

Table 3b – General requirements

Name of the waste operation	Sandy lane Quarry Restoration
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references Application Report Appendix 6 DMP
If the technical guidance or your risk assessment shows that odours are an important issue, send us your odour management plan. **If your activity type is listed in the guidance document 'Control and monitor emissions for your environmental permit' as needing an odour management plan, or your risk assessment shows that odours are an important issue, you need to send us your odour management plan.**	Document reference or references N/A
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references N/A

3 Operating techniques, continued

We may need to ask for management plans or risk assessments in other circumstances based on our regulatory experience. If you are unsure as to whether you need to submit a management plan with your application, please discuss this with the Environment Agency prior to submission.

Search for 'Risk assessment for your environmental permit' at www.gov.uk/government/organisations/environment-agency.

3c Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed in Table 3c, you must answer the questions in the related document.

Table 3c – Questions for specific sectors

Sector	Appendix
Recovery to land for agricultural benefit of compost like outputs from the treatment of mixed municipal solid wastes	See the questions in appendix 1
Inert landfill and deposit of waste on land for construction, land reclamation, restoration or improvement	See the questions in appendix 2

General information

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference: See Application Report, Appendix 8 ESSD report, Section 6

4b Point source emissions to air only

Provide an assessment of the sampling locations used to measure point source emissions to air. The assessment must use M1 (search for 'M1 sampling requirements for stack emission monitoring' at www.gov.uk/government/organisations/environment-agency).

Document reference of the assessment: N/A

5 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 2.

Appendix 1 – Specific questions for the recovery to land for agricultural benefit of compost like outputs from the treatment of mixed municipal solid wastes

1 Please provide an accurate and reliable characterisation of your compost like outputs (CLO). This should be based on sampling and analysis of the CLO produced by the treatment (MBT) process over a 12-month period and in accordance with section 2 of TGN 6.15

Document reference

2 Please provide an agricultural benefit assessment for the use of your CLO. This should be based on section 2 of TGN 6.15 and should be signed and dated by an appropriate technical expert

Document reference

3 Please provide a site-specific risk assessment of risks to soil and food chain receptors. This should be based on Schedule 2 of TGN 6.15 and include a map with a green outline showing the boundary of the area being treated and include:

- locations where the waste will be stored and spread
- any spring, well or borehole used to supply water for domestic or food production purposes that is within 250 metres of the area being treated
- any spring, well or borehole not being used for domestic or food production purposes that is within 50 metres of the area being treated
- any European designated sites (candidate or Special Area of Conservation, proposed or Special Protections Area in England and Wales or Ramsar Site) or Sites of Special Scientific Interest (SSSI) which are within 500 metres of the place where waste is to be stored or spread
- the location of public rights of way
- any Groundwater Source Protection Zones
- surface watercourses
- any buildings or houses within 250 metres of the area being treated
- land drains within the boundary

Document reference

4 Are the technical standards and measures fully in line with those set out in section 3 of TGN 6.15?

No ☐ Provide justification for departure from TGN 6.15 and a copy of the proposed technical standards, measures or procedures

Document reference

Yes ☐

Appendix 2 – Specific questions for inert waste landfill and deposit for recovery operations

1 Please provide your Environmental Setting and Site Design (ESSD) report

Document reference: Application Report, App 8 ESSD Report

Note: You should use the Environment Agency template to help you develop an environmental setting and site design (ESSD) report.

2 Please provide your Waste Acceptance Procedures (including Waste Acceptance Criteria)

Document reference: Application Report, App 6, WAP

3 Have you provided a hydrogeological risk assessment (HRA) for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Yes ☑ Document reference: Application Report, App 3 HRA

4 Have you completed an outline engineering plan for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Yes ☑ Document reference: Application Report, App 8 ESSD Report

5 Have you provided a stability risk assessment (SRA) for your site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Yes ☑ Document reference: Application Report, App 4 SRA

Appendix 2 – Specific questions for inert waste landfill and deposit for recovery operations, continued

6 Have you completed a monitoring plan for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Yes ☑ Document reference Application Report, Appendix 8 ESSD Report, Section 6.

7 Have you completed a plan for closing the site and procedures for looking after the site once it has closed?

No ☑ If no for deposit for recovery activities please refer to the section of your ESSD that explains why this is unnecessary for your site

Yes ☐ For inert waste landfill you must provide a closure plan

Document reference

Spreading waste to support plant growth

8a Does the activity involve the deposit of waste to create or treat a growing medium (R10 for land treatment)?

No ☐

Yes ☑

8b If you answered 'yes' to question 8a, does the R10 activity include the spreading of waste to improve the quality of the growing medium (e.g. soil conditioner to improve existing soil profile)?

No ☑

Yes ☐ Go to question 8c

8c If you have answered 'Yes' to question 8b, have you completed a benefit statement?

No ☐ Please explain why

Document reference

Yes ☐

Note: Refer to our guidance when completing your statement (including EPR 8.01, section 6).

Application Forms

Part F1

Application for an environmental permit Part F1 – Charges and declarations

We recommend you use an Adobe Acrobat product to complete the form. You may not be able to complete the form using different software, such as the PDF reader built into your internet browser

Fill in this part for all applications for:

- installations (excluding new permit and variation applications for intensive farming. Use application form Part B3.5 or C3.5 instead)
- waste operations
- mining waste operations
- medium combustion plant
- specified generators
- water discharges (excluding treated domestic sewage effluent discharges of up to 15 cubic metres (15m^3) a day into ground or up to 20 cubic metres (20m^3) a day to surface water)
- groundwater activities (excluding small discharges of 15m^3 per day or less if using Part B6.5 OR existing small discharges to Source Protection Zone1 if using Part B6.6)

Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in.

2) printed off and filled in by hand. Please write clearly in the answer spaces.

We anticipate it will take less than 3 hours to fill in this form if you have all the necessary information available.

Contents

1 Working out charges

You must fill out this section for all applications except for waste mobile plant and Part B surrender notifications.

You have to submit an application fee with your application. For guidance on the fee and how to pay your charges, please see our charging guidance (**https://www.gov.uk/government/publications/environmental-permitting-charges-guidance**) and the current charging scheme **https://www.gov.uk/government/publications/environmental-permits-and-abstraction-licences-tables-of-charges**. You can also contact us for pre-application advice to help work out the charges.

Please note that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type and number of facilities being applied for

For example, if you are submitting one installation application, enter the number one into the first column.

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/ Specified Generator (SG)	Water discharge	Groundwater activity
	1				

Table 2 – General application charge (A)

Charge activity reference from the charging scheme tables	Charge activity description from the charging scheme tables	What are you applying for? For example, a new permit, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Section 5.2 – landfill for hazardous waste	e.g. transfer application	e.g. £5,561
1.17.9	Deposit of waste for recovery	New Permit	£9,207
1.16.12	Physical treatment of non hazardous wast	New Permit	£7,930
Total A			£17,137.00

1 Working out charges, continued

Table 3 – Additional assessment charges (B)

Part 1.19 Charges for plans and assessments			Tick appropriate
Reference	Plan or assessment	Charge	
1.19.1	Waste recovery plan or variation or revision of a waste recovery plan.	£1,231	☑
1.19.2	Habitats assessment (except where the application activity is a flood risk activity, water discharge or groundwater activity).	£779	☐
1.19.3	Fire prevention plan (except where the application activity is a farming installation).	£1,241	☐
1.19.4	Pests management plan (except where the application activity is a farming installation).	£1,241	☐
1.19.5	Emissions management plan (except where the application activity is a farming installation).	£1,241	☑
1.19.6	Odour management plan (except where the application activity is a farming installation).	£1,246	☐
1.19.7	Noise and vibration management plan (except where the application activity is a farming installation).	£1,246	☐
1.19.8	Ammonia modelling assessment	£620	☐
1.19.9	Dust and bio-aerosol management plan.	£620	☐
1.19.10	Habitats assessment for discharges to water and groundwater activities.	£2,035	☐
1.19.11	Specific Substances Assessment for a water discharge activity to surface water.	£3,774	☐
1.19.12	Specific Substances Assessment for a groundwater activity.	£1,546	☐
1.19.13	Advertising	£500	☐
Total B			£2472

Total charges

Add the total charges from Table 1 to the total charges from Table 2 (total A plus total B)

£19,609

2 Payment

You must fill out this section for all applications except for waste mobile plant and Part B surrender notifications.

Tick below to show how you have paid.

☐ Cheque

☐ Credit or debit card

☑ Electronic transfer (for example, BACS)

Cheques

You should make cheques payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

2 Payment, continued

Please write the name of your company and application reference number on the back of your cheque. We will not accept cheques with a future date on them.

Credit/debit cards

If you are paying by credit or with debit card we will call you. We can accept payments by Visa, MasterCard or Maestro card only.

☐ Call me to arrange payment by debit or credit card

Electronic transfer BACS

If you choose to pay by electronic transfer, you will need to use the following information to make your payment:

Company name	Environment Agency
Company address	SSCL (Environment Agency), PO Box 797, Newport Gwent, NP10 8FZ
Bank	RBS/NatWest
Address	London Corporate Service Centre, CPB Services, 2nd Floor, 280 Bishopsgate, London EC2M 4RB
Sort code	60-70-80
Account number	10014411
Account name	EA RECEIPTS
Payment reference number	PSCAPPXXXXXYYY

You need to create your own reference number. It should begin with PSCAPPWASTE (Waste), PSCAPPINST (Installation), PSCAPPWQ (Water Quality) (to reflect the facility type) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

You should also email your payment details and reference number to **ea_fsc_ar@gov.sscl.com**.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWBK60708010014411 and our SWIFTBIC number is NWBKGB2L.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Provide a unique reference number for the application, i.e. do not only use the company name only

PSCAPPNRSBR002

State who is paying (full name and whether this is the agent/applicant/other)

Mark Ketcher (Applicant)

Fee paid

£ £19,609

Date payment sent (DD/MM/YYYY)

3 Privacy notice

The Environment Agency runs the environmental permit application service.

See **https://www.gov.uk/guidance/environmental-permits-privacy-notice** for how we use your personal information in services to support environmental permitting.

4 Confidentiality and national security

Confidentiality

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application. You can find guidance on confidentiality in 'Environmental permitting guidance: core guidance', published by Defra and available at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**.

Only tick the box below if you wish to claim confidentiality for parts of your application

☐ Please treat the specified information in my application as confidential

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Environmental permitting guidance: core guidance', published by Defra and available at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

If you knowingly or recklessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

5 Declaration, continued

Note: we will issue a letter to both current and new holders to confirm the transfer. If you are changing address we will need to send this letter to your new address; therefore please tell us your new address in a separate letter.

If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

☐ Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)

☐ I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities)

☐ Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1)

Name

Title

Mr

First name

Mark

Last name

Ketcher

on behalf of (if relevant; for example, a company or organisation and so on)

NRS Bromsgrove Aggregates Ltd

Position (if relevant; for example, a company or organisation and so on)

Director

Today's date (DD/MM/YYYY)

07/03/25

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

5 Declaration, continued

☐ Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)

Name

Title

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant; for example, a company or organisation and so on)

Today's date (DD/MM/YYYY)

Now go to section 6

6 Application checklist

You must fill in this section.

If your application is not complete, we will return it to you. If you aren't sure about what you need to send, contact us before you submit your application. For further information on pre-application advice, see **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit.**

You must do the following:

☑ Complete legibly all parts of the application form that are relevant to you and your activities

☑ Identify relevant supporting information in the form and send it with the application

☑ List all the documents you are sending in the table below.

☑ For new permit applications or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1

☐ Provide a supporting letter for any claim that information is confidential

☑ Get the declaration completed by a relevant person (not an agent)

☑ Send the correct fee

6 Application checklist, continued

Continue on an extra sheet if necessary.

Question reference	Document title	Document reference
All	Application checklist	List of Appendices

Document reference

List of Appendices

7 How to contact us

If you have difficulty filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

8 Where to send your application

For how many copies to send see the guidance note on part F1.

Please send your filled in application form and supporting documents to:

For water discharges and groundwater activities by email to
PSC-WaterQuality@environment-agency.gov.uk

For waste, installations, medium combustion plant and specified generators by email to
PSC@environment-agency.gov.uk

For large electronic documents (too large for email attachment) you can upload your applications to file sharing sites and send us a link to download the documents. Alternatively, you can send more than one email with documents attached.

Or by post to:

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

☑ Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in the Part A form).

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes.

Would you like a reply to your feedback?

☐ Yes please

☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

☐ No

☐ Yes

Amount received (£)

Drawings

Permit Boundary Plan	Drawing number 20/022 001
Indicative Site Layout Plan	Drawing number 20/022 004

Client: NRS Bromsgrove Aggregates Limited

Title: Permit Boundary Plan

Site:
Sandy Lane Quarry,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worchestershire,
B61 0QT

Date: 30th June 2022

Scale: 1:6000

Reference: 20/022 001

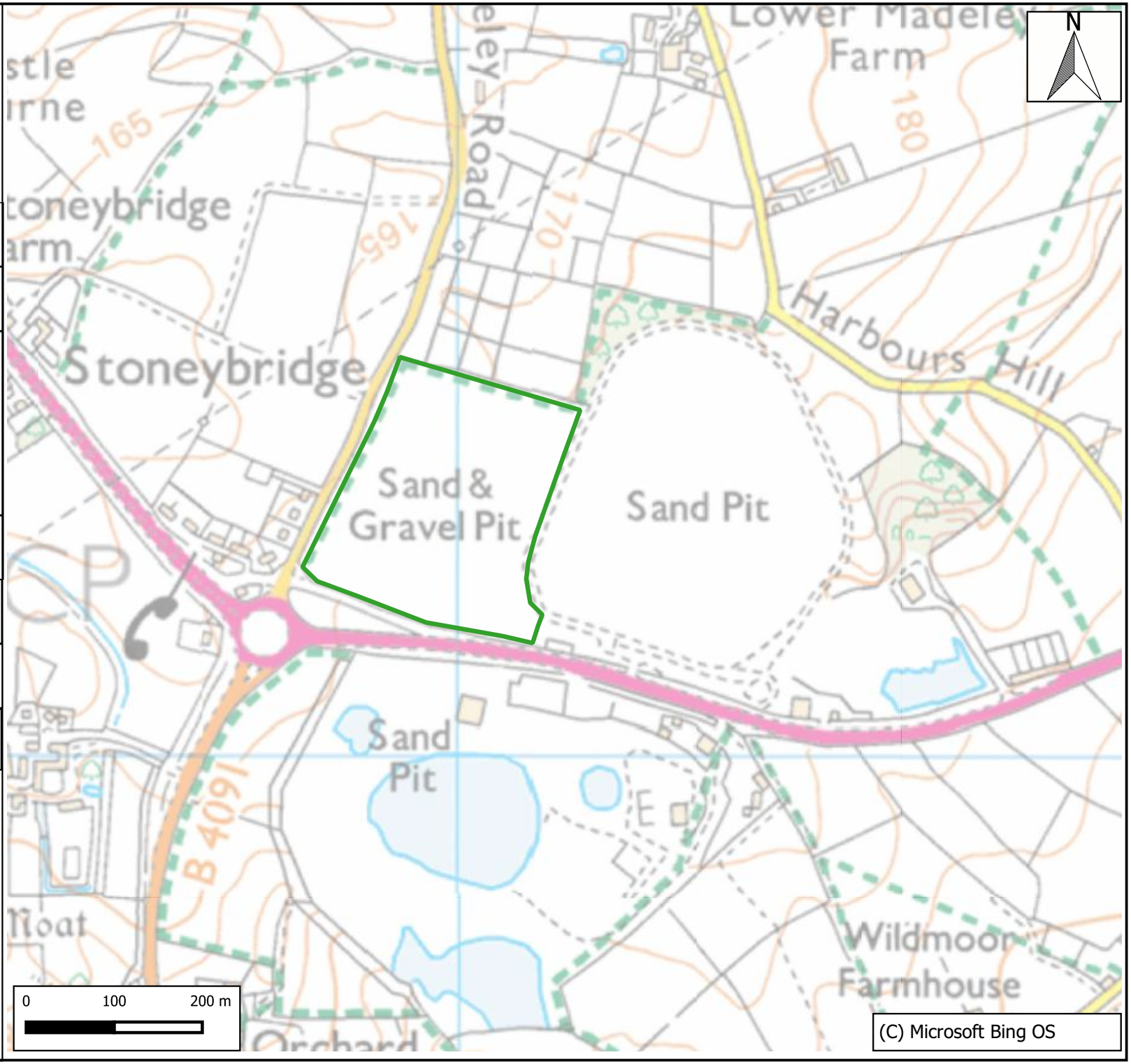
Permit boundary

WESTBURY ENVIRONMENTAL

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk



Group of Companies

Client: NRS Bromsgrove Aggregates Limited

Title: Indicitive Site Layout Plan

Site:
Sandy Lane Quarry,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worcestershire,
B61 0QT

Date: 07 February 2025

Scale: 1:3286

Reference: 20/022 004

Produced by: SW
Checked by: TW

WESTBURY ENVIRONMENTAL
PROVIDING SOLUTIONS, ENSURING COMPLIANCE
T 01932 879705 E info@westburyenv.co.uk
A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR
W www.westburyenv.co.uk

Appendix 1

Waste Recovery Plan

Waste Recovery Plan

NRS Bromsgrove Aggregates Limited

Sandy Lane Quarry restoration,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worcestershire,
B61 0QT.

WESTBURY ENVIRONMENTAL

PROVIDING SOLUTIONS, ENSURING COMPLIANCE

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk

Document Control Table

Project Reference	20/022b
Project Title	Sandy Lane: Waste Recovery Plan
Document Title	Waste Recovery Plan: Version 2
Document Issue Date	13 July 2022
Client	NRS Bromsgrove Aggregates Limited
Status	Issued

Version Control

Version	Comment	Produced by	Checked by	Date
1	Issued	Georgina Watkins/ Kate Brady	Tracey Westbury	19 August 2021
2	Updated to confirm grant of planning permission and condition which obligates restoration. (Changes from V1 highlighted in yellow)	Bethany Stott	Kate Brady	13 July 2022

Contents

Tables

Drawings

Drawing No. NRS-001-W.D.001	Location Plan	Dated Apr 2021
Drawing No. NRS-001-W.D.007	Current Situation	Dated Apr 2021
Drawing No. NRS-001-W.D.008	Stage 1 Operations	Dated Apr 2021
Drawing No. NRS-001.W.D.009	Stage 2 Operations	Dated Apr 2021
Drawing No. NRS-001-W.D.010 Rev A	Concept Restoration	Dated Nov 2021

Appendices

1. Introduction

1.1. Westbury Environmental Limited have been instructed to prepare this Waste Recovery Plan on behalf of NRS Bromsgrove Aggregates Limited (the Operator) for the proposed restoration of a sand and gravel quarry at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT.

1.2. The entire Quarry comprises three main areas; in the centre is an active but restored non-hazardous landfill (c.16ha), to the east former silt settlement lagoons (c.1.5ha) and in the west a disused quarry void (c.7ha).

1.3. This Waste Recovery Plan considers only the western quarry void only (the Site), as shown on Location Plan, Drawing No. NRS-001-W.D.001.

1.4. Version 1 of this Waste Recovery Plan sought agreement in principle that the operation would be waste recovery, subject to confirmation of the restoration contours with the planning authority.

1.5. The Environment Agency concluded they were 'not yet satisfied' that the operation was waste recovery following review of the Waste Recovery Plan Version 1, until the planning permission to confirm the restoration contours were issued. A copy of this opinion and cover email are provided as Appendix 4.

1.6. The purpose of this Waste Recovery Plan (Version 2) is to obtain Environment Agency confirmation that the proposals constitute a deposit of waste for recovery operation. This Waste Recovery Plan accompanies an Environmental Permit Application for the deposit of waste for recovery, in restoring the quarry void.

Site Setting

1.7. The Site is located approximately 5km to the north of Bromsgrove and 3km east of Rubery. The centre of the Site is located at National Grid Reference SO 94980 76290.

1.8. The A491, Sandy Lane, runs broadly east-west along the southern boundary of the Site. The Site is accessed from Sandy Lane at National Grid Reference SO 95199 76095.

Planning Permission

1.9. The site benefitted from and was excavated under a Review of Mineral Planning Permissions (ROMP) decision (Ref. 107110/DC5060/5). This ROMP was approved by Worcestershire County Council on 20 March 2000, see Appendix 1 ROMP.

1.10. The ROMP lapsed on 20 March 2017 as it was not renewed, meaning that only the Conditions 12 and 13 currently apply to the Site. Conditions 12 and 13 relate to the restoration and aftercare of the Site.

1.11. Conditions 12 and 13 of the ROMP, require the removal of all quarrying infrastructure and reclamation of the site for agricultural use.

1.12. Planning permission (reference 21/000029/CM) was granted on the 8 July 2022. This permission allows limited excavation of sand to prevent sterilisation of mineral and the importation of material for to restore the Site. A copy of the Decision Notice is provided in Appendix 2.

1.13. Under the permission 21/000029/CM, 245,000 tonnes of sand will be excavated to prevent sterilisation and 975,000m^3 of material will be imported to restore the Site.

1.14. Further detail on the planning permission conditions relevant to the site restoration are provided in Section 2, Waste Recovery Test.

Restoration

1.15. The restoration will involve the importation of approximately 975,000m^3 of material to restore the Site.

1.16. The objectives of the restoration of the Site are to:

- Stabilise the eastern flank of the Site, adjoining the neighbouring landfill.
- Restore the Site back to pre-excavation ground levels.
- Create a landform that is congruous with the surrounding landscape.

1.17. The objectives of the quarry restoration described above will provide several benefits to the Site and the surrounding area. These benefits are discussed further in Section 3 Purpose of the proposed works.

Waste Recovery

1.18. This Waste Recovery Plan has been prepared in accordance with the EA guidance 'Waste recovery plans and deposit for recovery permits' published 21 April 2021 (hereinafter referred to as 'EA guidance').

1.19. This WRP outlines how the proposals meet the Waste Recovery Test. The WRP is supported by the following additional information which details the appropriateness of the works;

- Purpose of the work
- Quantity of waste used
- Meeting quality standards

2. Waste recovery test

2.1. EA guidance states that depositing waste is only a recovery activity if it can be shown that the proposed works could and would have been carried out using non-waste material. The Environment Agency refer to this as 'substitution'.

2.2. One waste cannot be substituted for another. If the original material to be used was also a waste, it must be demonstrated that End of Waste status could and would be achieved, for example by complying with a quality protocol.

2.3. The following factors may indicate that non-waste would be used for the proposed works.

- Financial gain or other worthwhile benefit by using non-waste materials.
- Funding to use non-waste materials.
- Obligation to complete the scheme.
- Evidence the waste is serving a useful purpose.

Planning Obligation

2.4. The quarry was excavated under the ROMP planning permission, see Appendix 1 ROMP Ref. 107110/DC5060/5. Though lapsed, Conditions 12 and 13 of the ROMP remain current. Conditions 12 and 13 relate to the restoration and aftercare of the Site.

Condition 12:

"The Site shall be reclaimed…within 6 months of cessation of extraction or by 31 March 2003, whichever is the sooner, unless a later date has been agreed in advance in writing by the Mineral Planning Authority, a detailed restoration scheme shall be submitted for the approval of the Mineral Planning Authority and the restoration of the site shall be undertaken in accordance with such approved scheme."

Condition 13

"All plant and buildings shall be removed from the site on completion of quarrying, unless otherwise agreed in writing with the Mineral Planning Authority."

2.5. It is accepted that the Site requires restoration in accordance with the existing ROMP permission (see EA opinion, Appendix 4).

2.6. The planning permission 21/000029/CM was granted by Worcestershire County Council on 08 July 2022.

2.7. Condition 4 of this permission provides the restoration contours that the site must be restored in accordance with.

"The development hereby approved shall be carried out in accordance with the details shown on the following approved drawings, except where otherwise stipulated by conditions attached to this permission:

- *Drawing number: NRS-001-W.D.001, titled: 'Location Plan', dated April 2021*
- *Drawing number: NRS-001-W.D.007, titled: 'Current situation', dated April 2021*
- *Drawing number: NRS-001-W.D.008, titled: 'Stage 1 Operations', dated April 2021*
- *Drawing number: NRS-001-W.D.009, titled: 'Stage 2 Operations', dated April 2021*
- *Drawing number: NRS-001-W.D.010 REV A, titled: 'Concept Restoration', dated November 2021.*

2.8. It is this permission which will provide the legal obligation for the Site's restoration.

2.9. This Waste Recovery Plan sets out how the proposed restoration constitutes a waste recovery activity rather than a waste disposal operation.

2.10. Approval of the proposals within this Waste Recovery Plan is sought so that an Environmental Permit application for deposit of waste for recovery can be made to the Environment Agency.

Supporting information

2.11. EA guidance requires that unless there is a specific obligation to carry out the work, a WRP must be supported by supporting information. In addition to the legal obligation to restore the Site described above, further information has been provided regarding:

- Purpose of the work
- Quantity of waste used
- Meeting quality standards

3. Purpose of the proposed works

3.1. The purpose of the proposed works is to restore the Site to the approved restoration profile in accordance with the requirements of the planning permission approved by Worcestershire County Council 8 July 2022.

3.2. The proposed restoration contours are shown on the following drawings:

- Drawing No. NRS-001-W.D.007 Current Situation
- Drawing No. NRS-001-W.D.008 Stage 1 Operations
- Drawing No. NRS-001.W.D.009 Stage 2 Operations
- Drawing No. NRS-001-W.D.010 Concept Restoration

3.3. A Stability Risk Assessment (SRA) was carried out on the western flank of the adjacent Veolia Landfill (eastern boundary of the Site) by Key GS Limited. This SRA concluded that to ensure long-term stability, this slope should be buttressed and ideally restored so that there are no high or steep faces remaining. A copy of this SRA is provided as Appendix 3.

3.4. The proposed restoration profile will help to ensure that the existing western boundary of the Veolia Landfill is bolstered to ensure stability in the long-term. It will also achieve compliance with the ROMP to restore the Site to beneficial use.

3.5. It is estimated that 975,000m^3 of material will be required to complete the proposed restoration profile.

4. Quantity of waste used

4.1. It is calculated that 975,000m^3 of material will be required to complete the proposed restoration profile set out in the Concept Restoration plan, see Drawing No. NRS-001-W.D.010 which has been formally approved by Worcestershire County Council.

4.2. EA guidance requires that: -

- waste material used will directly replace non-waste material.
- the amount of waste used is needed to carry out the function that would otherwise be provided by non-waste.
- consideration has been given to alternative proposals that could use a smaller amount of waste to achieve the same function.

Waste will directly replace non-waste material

4.3. There is an obligation to restore the Site in accordance with the ROMP permission. There is a specific obligation to restore the Site in accordance with Condition 4 of permission 21/000029/CM issued 08 July 2022 (see Appendix 2). Condition 6 of the same permission requires that the development be restored within 6 years from commencement.

4.4. It is considered if non-waste materials were to be used in this restoration, these would comprise the use of either virgin minerals or recycled aggregates, sourced from local suppliers. The use of such materials does not offer any advantage to the restoration over the proposed use of waste soils.

4.5. The proposed waste materials will replace non-waste materials that would otherwise be used. These materials are predominately the same, despite one being defined as a waste and another not a waste. If waste materials were not available, aggregates produced under the WRAP Quality Protocol: Aggregates from Inert Waste, would be used to restore the Site. Recycled highways standard bulk-fill products produced in accordance with the WRAP Quality Protocol, have similar, if not identical, geotechnical properties to some types of sub-soils. Therefore, the proposed waste materials will have similar engineering properties as non-waste materials that would otherwise be used.

4.6. The proposed substitution of waste for a non-waste material in the development at the Site supports Recital 8 of the Waste Framework Directive which states that; -

"… the recovery of waste and the use of recovered materials should be encouraged in order to conserve natural resources".

4.7. The use of waste rather than non-waste materials is consistent with the European Court of Justice (ECJ) Abfall case which found that; -

"...the essential characteristic of a waste recovery operation is that its principal objective is that the waste serve a useful purpose in replacing other materials which would have had to be used for that purpose, thereby conserving natural resources." (paragraph 69).

And

"a deposit constitutes a recovery if its principal objective is that the waste serves a useful purpose in replacing other materials which would have had to be used for that purpose." (paragraph 71).

4.8. The Abfall case found that the substitution of waste for non-waste/ higher grade materials that would otherwise have to be used, demonstrates the substitution test, and ensures the conservation of natural resources.

Using the minimum amount of waste

4.9. It is calculated that approximately 975,000m^3 of material would be required to complete the proposed restoration profile. This volume has been calculated by a cut/fill method that accounts for the difference between existing ground levels / base of mineral and the ground levels of the restoration profile.

4.10. The volume of material is required to construct the slope-supporting buttress and to tie this buttress into the existing landscape, without the need for further steep slopes in accordance with the Stability Risk Assessment (Appendix 3). As such, it is considered that the restoration could not reasonably be achieved using less waste.

Alternate proposals

4.11. The restoration profile has been designed to provide the necessary support to the existing steep landfill face to ensure stability in the long-term and to tie this restoration in with the landscape. Alternative restoration contours may have been designed to achieve a similar outcome. However, to be both beneficial and appropriate for the Site setting, these designs are not likely to be significantly different to the proposed restoration profile and therefore the volume of restoration material required is unlikely to be significantly lower.

4.12. It is considered that alternate proposals, that would result in a landform with different contours, which still satisfies the stability and long-term objectives of the planning permission for the Site are no more viable than the proposal outlined in this Waste Recovery Plan.

5. Meeting quality standards

5.1. EA guidance requires that the deposit of waste for recovery scheme should be:

- Designed and constructed.
- Fit for purpose.

5.2. The finished scheme should not result in any environmental problems such as:

- Pollution[1]
- Soil erosion
- Increased risk of flooding to the surrounding area.

Design and Construction

5.3. The proposed restoration profile will be completed in accordance with planning permission 21/000029/CM. The approved permission requires restoration to land contours and features given in Concept Restoration, Drawing No. NRS-001-W.D.010.

5.4. Adherence to the approved planning conditions will ensure that that the restoration will meet quality standards. Worcestershire County Council will regulate and enforce the conditions of this planning permission.

5.5. All materials will be handled in accordance with the “Good practice guide for handling soils” (2000) produced by the Ministry of Agriculture, Fisheries and Food.

5.6. The imported waste will be deposited in accordance with best practice by experienced staff members. The construction materials will be handled and placed into the construction using bulldozers and excavators. Materials will not be handled when overly wet.

Fit for Purpose

5.7. The chemical and physical properties of the waste proposed to be used in this waste recovery operation must be suitable for the intended purpose.

5.8. An assessment of the types of waste that will be suitable for use in this development has been made by Tracey Westbury, Director of Westbury Environmental Limited who is suitably qualified to make this assessment based on:

- Chartered status with the Chartered Institute of Waste Managers (CIWM).
- A total of 30 years' work experience within the environmental industry including chemical industry waste, contaminated land, wastewater treatment and regulation.
- Over 20 years' work experience acting as an environmental consultant dealing with both landfill and recovery permits.

5.9. The types of waste that will be used include soils, subsoils and minerals. The wastes will not have hazardous properties. Wastes used in the restoration will predominately comprise the waste code 17 05 04 "soils and stones from construction / demolition wastes not containing hazardous substances", however other suitable wastes may be used.

[1] as defined in the Environmental Permitting (England and Wales) Regulations 2016

5.11. Table 5.1 includes the list of waste types that can be used in the restoration works.

Table 5.1: Waste types which can be used in the restoration

Exclusions Wastes having any of the following characteristics shall not be accepted: • Consisting solely or mainly of dusts, powders, or loose fibres • Wastes that are in a form which is either sludge or liquid				
Source	**Sub-source**	**Waste code**	**Description**	**Additional restrictions**
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 01 wastes from mineral excavation	01 01 02	Wastes from mineral non- metalliferous excavation	Restricted to waste overburden and interburden only.
	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06	
		01 04 09	Waste sand and clays	
02 Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 04 wastes from sugar processing	02 04 01	Soil from cleaning and washing beet	Will be limited to placement in the upper 0.5m only.
10 Wastes from thermal processes	10 12 wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles, and construction products (after thermal processing)	
	10 13 waste from manufacture of cement, lime and plaster and articles and products made from them	10 13 14	Waste concrete	
17 Construction and demolition wastes	17 01 concrete, bricks, tiles and ceramics	17 01 01	Concrete	
		17 01 02	Bricks	
		17 01 03	Tiles and ceramics	
		17 01 07	Mixtures of concrete, bricks, tiles, and ceramics other than those mentioned in 17 01 06	Metal from reinforced concrete must have been removed.
	17 03 bituminous mixtures	17 03 02	Bituminous mixtures other than those mentioned in 17 03 01	Road planning's only.
	17 05 soil stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03	Restricted to topsoil, peat, subsoil, and stones only. Topsoil and peat will be limited to placement in the upper 0.5m only.

Source	Sub-source	Waste code	Description	Additional restrictions
19 Wastes from waste management facilities	19 12 wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified	19 12 09	Minerals (for example sand, stones) only	Restricted to wastes from treatment of waste aggregates that are otherwise naturally occurring minerals. Does not include fines from treatment of any mixed municipal non-hazardous waste or gypsum from recovered plasterboard
		19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	Restricted to crushed bricks, tiles, concrete and ceramics and soils from the mechanical treatment of construction / demolition waste. Metal from reinforced concrete must be removed. Does not include gypsum from recovered plasterboard.
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02 garden and park wastes	20 02 02	Soils and stones	Restricted to topsoil, peat, subsoil and stones only. Topsoil and peat will be limited to placement in the upper 0.5m only.

Pollution Controls

5.12. The chemical and physical properties of the waste proposed to be used in this waste recovery operation must not cause pollution.

5.13. The risk of pollution will be controlled by a deposit of waste for recovery Environmental Permit. The Environmental Permit application will be supported by the necessary Environmental Risk Assessments which will demonstrate the pollution controls to be employed.

5.14. The Operator will apply strict Waste Acceptance Procedures which will control how waste is accepted and ensure only suitable waste is deposited. A copy of the Waste Acceptance Procedures is included in the . The Operator will be responsible for assessing the suitability of the waste to be deposited against these Waste Acceptance Procedures.

5.15. The Waste Acceptance Procedures will form part of the Environmental Management System (EMS) for the Site. An EMS is a requirement of all environmental permits and will be implemented to comply with the standard permit condition of the environmental permit issued for the Site.

5.16. Once the restoration has been completed, an Environmental Permit surrender application will be submitted to the Environment Agency. The surrender application will demonstrate that the works have been completed in accordance with the approved planning permission and the approved Waste Recovery Plan.

6. Conclusion

6.1. From the information provided within this Waste Recovery Plan, it has been demonstrated that:

- There is an obligation to restore the former quarry void.
- Waste directly replaces non-waste materials.
- The volume of waste to be used is the minimum required to achieve the designed outcome.
- Alternate proposals using less waste are unlikely to result in a materially different profile.
- The Approved Restoration will be carried out and maintained to an appropriate standard which will be enforced through the requirements of a planning permission and an Environmental Permit.

6.2. It is considered that this Waste Recovery Plan demonstrates that there is an obligation to restore the Site in accordance with the restoration plans within the approved planning permission. It is recommended that approval of the Waste Recovery Plan is granted to allow progress of the permit application.

6.3. The Environmental Permit application will seek to allow a total of approximately 975,000m^3 of waste material to be deposited at the Site. The restoration will be completed in accordance with the approved restoration plans included as part of the planning permission referred to in this WRP.

Drawings

Drawing No. NRS-001-W.D.001	Location Plan	Dated Apr 2021
Drawing No. NRS-001-W.D.007	Current Situation	Dated Apr 2021
Drawing No. NRS-001-W.D.008	Stage 1 Operations	Dated Apr 2021
Drawing No. NRS-001.W.D.009	Stage 2 Operations	Dated Apr 2021
Drawing No. NRS-001-W.D.010 Rev A	Concept Restoration	Dated Nov 2021

Sandy Lane

Location Plan

LEGEND

Application Site Boundary

Heatons

Planning Environment Design

PROJECT
Sandy Lane

DRAWING TITLE
Location Plan

DATE
April 2021

REFERENCE
NRS-001-W.D.001

SCALE
1:25,000 @ A3

STATUS
FINAL

Heatons 9 The Square, Keyworth, Nottinghamshire NG12 5JT
t. 0115 937 5552 www.heatonplanning.co.uk

Sandy Lane Quarry

Current Situation

Madeley Road

Harbours Hill

Agricultural Land

Agricultural Land

toneybridge

STONEYBRIDGE

A49 - Stourbridge Road

Existing Worked Out Void

AREA OF LAND REQUIRING STABILISATION

VEOLIA UK Sandy Lane Site *Restored*

Fairfield

A491 - Sandy Lane

Weighbridge & Office

Site Entrance

A491 - Sandy Lane

Wildmoor Quarry - *Operational*

Agricultural Land

Sand Pit

Lake

Depot

160.0 170.0 178.0 174.0 164.0 154.0 156.0 151.0 152.0 160.0 180.0 194.0 164.0 170.0 160.0 174.0

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - In-Situ Mineral
- Natural Regeneration
- 194.0 Existing 2m Contours (m aOD) & Spot Levels

Proposals:

The application Site is directly accessed off the A491 - Sandy Lane.

Enginering works are required to the eastern boundary of he Site, adjacent to the previous Sandy Lane Tip Landfill Site.

The application works would release ~ 245,000 tonnes of sand

Th engineering and restoration works will require ~ 975,000m³ of imported inert material.

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Current Situation

DATE
April 2021

REFERENCE
NRS-001-W.D.007

SCALE
1:2,500 @ A3

STATUS
FINAL

Heatons 9 The Square, Keyworth, Nottinghamshire NG12 5JT
t. 0115 937 5552 www.heatonplanning.co.uk

Sandy Lane Quarry

Stage 1 Operations

Agricultural Land

Agricultural Land

Madeley Road

Harbours Hill

Existing Peripheral Vegetation to be Retained

Base of Extraction

Temporary 5m Soil Noise Attenuation Bund

Establishment of Stabilisation Buttress

VEOLIA UK Sandy Lane Site *Restored*

STONEYBRIDGE

A49 - Stourbridge Road

A491 - Sandy Lane

Access Ramp

Existing Peripheral Vegetation to be Retained

Weighbridge & Office

Site Entrance

Wildmoor Quarry - *Operational*

Sand Pit

Lake

Conveyors

Depot

Davescott

Fairfield Lodge

Farcroft

Pumping Station

WB

Path (um)

160.0 164.0 170.0 174.0 178.0 180.0 190.0 194.0 150.0

Stage 1 Operations

1. Initial engineering works to involve the importation and placement of materials for use in the creation of a stabilisation Buttress along the eastern boundary of the Site's internal void. The Buttress to permanently stabilise and support the previously created Sandy Lane Landfill Site.

2. Concurrently, imported inert materials are to be placed within the south western area of the Site, to both achieve final restoration levels, and create a temporary 5m high soil screening / noise attenuation barrier. The soils within the temporary bund to be utilised at the and of the works, to help create a soil profile on top of the restored landform. Bund to be seeded and maintained.

3. On-Site sand which could be sterilised by the stabilisation and restoration works is to be extracted and removed as "as dug" material.

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- Natural Regeneration
- 194.0 2m Contours (m aOD) & Spot Levels
- Placement of Imported Material
- Temporary Soil Screening / Noise Attenuation Bund (5m)

Materials Audit within this Phase:

Establishment of Buttress	Imported Inert Materials: ~ 230,000m³
Progressive Restoration	Imported Inert Materials: ~ 205,000m³
Subtotal	**Imported Inert Materials: ~ 435,000m³**
Soils in Temporary Bund	Imported Soils: ~ 16,000m³

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Stage 1 Operations

DATE
April 2021

REFERENCE
NRS-001-W.D.008

SCALE
1:2,500 @ A3

STATUS
FINAL

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Sandy Lane Quarry

Stage 2 Operations

Madeley Road

Harbours Hill

Agricultural Land

Agricultural Land

Existing Peripheral Vegetation to be Retained

Temporary 5m Soil Noise Attenuation Bund

Temporary Soil Storage Bund(s)

VEOLIA UK Sandy Lane Site *Restored*

STONEYBRIDGE

A49 - Stourbridge Road

A491 - Sandy Lane

Access Ramp

Weighbridge & Office

Site Entrance

Existing Peripheral Vegetation to be Retained

Sand Pit

Wildmoor Quarry - *Operational*

Sand Pit

Sand Pit

Lake

Conveyors

Depot

WB

Pumping Station

Davescott

Fairfield Lodge

Farcroft

Roseacre

Ports Cross

Path (um)

160.0 164.0 170.0 174.0 178.0 180.0 190.0 194.0 150.0

Stage 2 Operations

1. On-Site sand which could be sterilised as a result of restoration works is to be extracted and removed from Site as "as dug" material.
2. Concurrently, imported inert materials are to be placed within the unrestored void to achieve restoration formation levels. These materials to be placed progressively, in a north to south direction.
3. During this stage, imported sandy / acidic soils will be either directly placed onto progressively restored land at restoration formation levels to complete and achieve a soil profile of 300mm, or, temporarily placed in soil storage bunds of up to 3m in height, within the southern area of the Site for use in achieving the final restoration soil profile.
4. All restored land to be seeded with a Species Rich Acidic Grasslad mix and placed within a 5 Year Aftercare Management Scheme.

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- Natural Regeneration
- 194.0 2m Contours (m aOD) & Spot Levels
- Landform / Buttress Created in Stage 1
- Temporary Soil Screening / Noise Attenuation Bund (5m)
- Temporary Soil Storage Bund(s)
- Progressive Placement of Inert Restoration Materials
- Direction of Placement of Inert Restoration Materials

Materials Audit within this Phase:

Progressive Restoration to establish Formation Levels	Imported Inert Materials: ~ 540,000m³
Soils either Directly Placed or Temporarily Stored	Imported Soils: ~ 1,000m³

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Stage 2 Operations

DATE
April 2021

REFERENCE
NRS-001-W.D.009

SCALE
1:2,500 @ A3

STATUS
FINAL

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Sandy Lane Quarry

Concept Restoration

Madeley Road

Harbours Hill

Agricultural Land

Agricultural Land

In-Situ Sand Face

Drainage Ditch

Surface Water Management / Wildlife Pond

Existing Peripheral Vegetation to be Retained

Species Rich Acidic Grassland

VEOLIA UK Sandy Lane Site *Restored*

New Native Woodland Fringe (Tree & Shrub Planting)

STONEYBRIDGE

A49 - Stourbridge Road

Access Ramp

A491 - Sandy Lane

Existing Peripheral Vegetation to be Retained

Site Entrance

A491 - Sandy Lane

Wildmoor Quarry - *Operational*

Sand Pit

Depot

160.0 164.0 168.0 170.0 172.0 174.0 178.0 180.0 190.0 194.0

Concept Restoration

Aim: To establish a safe and sustainabl landform which stabilises the adjacent restored Sandy Lane Tip and creates new wildlife habitat to help meet Worcestershire's Biodiversity Targets.

Restoration Land Uses:

1.11 Ha of Existing Woodland Blocks

0.88 Ha of Proposed Tree & Shrub / Woodland Fringe Vegetations

5.07 Ha of Acidic Species Rich Grassland

0.21 Surface Water Management System *(to be determined)*

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- 194.0 2m Contours (m aOD) & Spot Levels

Restoration Proposals

- Species Rich Acidic Grassland
- New Native Woodland / Tree Shrub Planting
- Surface Water Management / Wildlife Pond
- Drainage Ditches
- In-Situ Sand Face

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Concept Restoration

DATE
Nov 2021

REFERENCE
NRS-001-W.D.010 Rev A

SCALE
1:2,500 @ A3

STATUS
FINAL

Heatons 9 The Square, Keyworth, Nottinghamshire NG12 5JT
t. 0115 937 5552 www.heatonplanning.co.uk

Appendix 1

Review of Minerals Planning Permissions, Ref. 107110/DC5060/5

9.179.2.4.3

Town and Country Planning Act 1990
Environment Act 1995

ENVIRONMENT ACT 1995
REVIEW OF MINERAL PLANNING PERMISSIONS

Determination of New Conditions, Environment Act 1995, Schedule 13

Name and Address of Applicant	Name and Address of Agent
Stanley N. Evans Ltd. Sandy Lane Wildmoor Bromsgrove B61 0QT	G.V.A. Grimley 25 Bucklersbury London EC4N 8DA

Part 1 - Particulars of Application

Date of Application	Application No.
3 November 1999	107110/DC5060/5 (B/2000/0015)

Location of development

Stanley N. Evans Ltd., Sand Pit, Wildmoor, Bromsgrove

Part II - Particulars of Decision

The Worcestershire County Council hereby give notice in pursuance of Part III of the Town and Country Planning Act 1990 and Schedule 13 of the Environment Act 1995 that the winning and working of minerals at the site referred to in Part I shall from the date hereof be subject to the following conditions:-

1. The land to which this review relates is that outlined in red on "Site Plan No. 1" dated 3 November 1999 and received by the County Council on 23 November 1999.

2. Except in emergencies to maintain safe quarry working (which shall be notified to the Mineral Planning Authority as soon as practicable) or unless the Mineral Planning Authority has agreed otherwise in advance in writing no excavation shall take place outside the hours of 7.00 a.m. to 7.00 p.m. on weekdays, 7.00 a.m. and 12 noon on Saturdays and there shall be no working on Sundays or Public holidays.

3. The height of any stockpile of material excavated from this site shall not exceed existing ground level.

4. No tipping or filling of the excavated areas other than with indigenous waste excavated within the site shall take place except in pursuance of a planning permission granted in that behalf under the provisions of the Town and Country Planning Act 1990.

Helen Frowd

Dated 20 March 2000

Director of Corporate Services
County Hall
Worcester WR5 2NP

Note: This decision notice refers only to that required under the Town and Country Planning Acts and the Environment Act 1995 and does not include any consent or approval under any other enactment, byelaw, order or regulation.

You have the right to appeal to the Secretary of State for the Environment against the Authority's decision. If you wish to appeal, you must give notice to the Secretary of State within 6 months of the date of this notice.

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5. Along the western boundary of the site the working face shall be no nearer to the boundary of the public highway than 9 metres and such workings will not exceed a depth of 12 metres for a distance of not less than 18 metres measured horizontally from the highway boundary.

6. Along the southern boundary of the site the working face of the excavations shall not exceed a depth of 12 metres for a distance of not less than 18 metres measured horizontally from the boundary.

7. All vehicles, plant and machinery operated within the site shall be maintained in accordance with the manufacturer's specification at all times and shall be fitted with and use effective silencers.

8. There shall be no discharge of foul or contaminated drainage from the site into either groundwater or any surface waters, whether direct or via soakaways.

9. Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound shall be at least equivalent to the capacity of the tank plus 10%. If there is multiple tankage, the compound shall be at least equivalent to the capacity of the largest tank, vessel or the combined capacity of interconnected tanks or vessels plus 10%. All filling points, associated pipework, vents, gauges and sight glasses must be located within the bund or have separate secondary containment. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipework shall be located above ground and protected from accidental damage. All filling points and tank/vessels overflow pipe outlets shall be detailed to discharge downwards into the bund.

10. There shall be no excavation below the level of 2m above the maximum winter water table. The applicant shall provide a borehole with a piezometer at the margin of the site. Readings shall be taken at monthly intervals and the results provided to the Mineral Planning Authority.

11. The existing hedgerows and trees on the southern and western boundaries of the site shall be retained and shall not be felled, lopped or topped without the previous written consent of the County Planning Authority. Any trees etc. removed without such consent or dying or being severely damaged or becoming seriously diseased shall be replaced with trees etc. of such size and species as may be agreed with the County Planning Authority.

12. The site shall be reclaimed for agricultural purposes; within 6 months of cessation of extraction or by 31 March 2003, whichever is the sooner, unless a later date has been agreed in advance in writing by the Mineral Planning Authority, a detailed restoration scheme shall be submitted for the approval of the Mineral Planning Authority and the restoration of the site shall be undertaken in accordance with such approved scheme.

13. All plant and buildings shall be removed from the site on completion of quarrying, unless otherwise agreed in writing with the Mineral Planning Authority.

14. All access shall be via the existing quarry entrance as indicated on the working plan number 2.

15. No loaded lorries shall leave the site unsheeted.

16. No loaded vehicles shall enter the public highway unless their wheels have been cleaned to prevent material being deposited on the highway.

17. Notwithstanding the provisions of parts 19 and 21 of Schedule 2 of the Town and Country Planning (General Permitted Development) Order 1995 (or any order amending, replacing or re-enacting that order) no fixed plant or machinery, buildings, structures and erections, or private ways shall be erected, extended, installed or replaced at the site/quarry complex without the prior agreement of the Mineral Planning Authority.

18. Reasonable steps shall be taken throughout the life of the quarry to minimise dust arisings from operations on the site. These measures shall include the use as necessary of a water bowser, sprayer or similar equipment.

19. The gradient of the access shall not exceed 1 in 20 for a distance of 15 metres from the nearside of the adjoining carriageway.

20. Drainage arrangements shall be provided to ensure that surface water from the driveway which is not part of the public highway does not discharge onto the public highway.

21. The general direction of workings shall be from the south to north.

22. The height of any mobile processing plant which is located within the quarry shall not exceed ground level.

The reasons for the conditions are:

1,4,17	To define the planning permission
2,3,7, 11,18,21, 22	To protect the local amenity
5,6	To protect the stability of the public highway.
8,9	To prevent pollution of the water environment.
10.	A minimum of 2 metres of unsaturated zone is required beneath the base of the working site to help protect groundwater quality.
12.	To ensure the satisfactory restoration of the site.
13.	To ensure the site is not left in a derelict state.
14,15,16 19,20	In the interests of highway safety.

Appendix 2

Planning permission reference 21/000029/CM

Town and Country Planning Act 1990

PLANNING PERMISSION

Name and Address of applicant

NRS Ltd
C/O agent

Name and Address of Agent (if any)

Mr Joel Jessup
Heatons
The Arc
6 Mallard Way, Pride Park
Derby, DE24 8GX

Part I - Particulars of application

Date of Application:	**Application No:**
30 July 2021	21/000029/CM

Particulars and location of development:

Proposed importation of inert restoration material and extraction of sand to enable engineering operations for stability purposes and completion of site restoration at (Western portion of the former) Sandy Lane Quarry, Wildmoor, Worcestershire.

Part II - Particulars of decision

Worcestershire County Council hereby give notice in pursuance of the provisions of the Town and Country Planning Act 1990 that having taken the environmental information into account **permission has been granted** for the carrying out of the development referred to in **Part I** hereof in accordance with the application and plans submitted subject to the following conditions:-

Commencement

1. The development must be begun not later than the expiration of three years beginning with the date of this permission.

2. The operator shall provide written notification to the Mineral Planning Authority at least five working days prior to:-

   i. The commencement of the development hereby approved;
   ii. The commencement of soil stripping operations in any stage;
   iii. The commencement of mineral extraction in any stage;
   iv. The completion of mineral extraction in any stage;
   v. The commencement of infilling operations in any stage; and
   vi. The completion of infilling operations in any stage.

Time Limit

3. All mineral extraction operations shall cease, and the site shall be restored in accordance with the approved restoration scheme as required by Condition 45) of this permission within 6 years of commencement of the development hereby approved. Should mineral extraction operations cease before this date, the Mineral Planning Authority shall be notified in writing within 1 month of mineral extraction operations ceasing.

Approved Plans

4. The development hereby approved shall be carried out in accordance with the details shown on the following approved drawings, except where otherwise stipulated by conditions attached to this permission:

   - Drawing number: NRS-001-W.D.001, titled: 'Location Plan', dated April 2021
   - Drawing number: NRS-001-W.D.007, titled: 'Current situation', dated April 2021
   - Drawing number: NRS-001-W.D.008, titled: 'Stage 1 Operations', dated April 2021
   - Drawing number: NRS-001-W.D.009, titled: 'Stage 2 Operations', dated April 2021
   - Drawing number: NRS-001-W.D.010 REV A, titled: 'Concept Restoration', dated November 2021.

Date 8 July 2022

County HallCounty Hall,Worcester WR5 2NP

Proper Officer: Tom Pollock, Head of Commercial Law

Note: This permission refers only to that required under the above Acts and Regulations and does not include any consent or approval under any other enactment, byelaw, order or regulation.

Waste Acceptance

5. No waste materials other than those defined in the application, namely construction, demolition and excavation wastes shall be imported to the site for infilling and restoration purposes.

Phasing

6. The site shall be progressively worked and restored in accordance with the phased working programme and contiguous restoration scheme as shown on the approved drawings numbered: NRS-001-W.D.008, titled: 'Stage 1 Operations', dated April 2021 and Drawing number: NRS-001-W.D.009, titled: 'Stage 2 Operations', dated April 2021, except where otherwise stipulated by conditions attached to this permission.

Depth of Working

7. No excavation or extraction shall take place below 150 metres Above Ordnance Datum (AOD).

Working Hours

8. Except in emergencies to maintain safe quarry working, all operations and uses on the site including the running of any plant or machinery, shall only take place between 07:00 to 19:00 hours Mondays to Fridays, inclusive, and 07:00 to 13:00 hours on Saturdays, with no operations on the site at any time on Sundays, Bank or Public Holidays. The Mineral Planning Authority shall be informed in writing within 48 hours of an emergency occurrence that would cause working outside the stipulated hours.

Highways and Public Rights of Way

9. Access to and from the site shall only be gained via existing access of Sandy Lane (A491) as shown on drawings numbered: NRS-001-W.D.008, titled: 'Stage 1 Operations', dated April 2021 and Drawing number: NRS-001-W.D.009, titled: 'Stage 2 Operations', dated April 2021.

10. No development hereby approved shall commence until a Construction Environmental Management Plan (CEMP) for highways has been submitted to and approved in writing by the Minerals Planning Authority. This shall include but not be limited to the following: -

    i. Measures to ensure that vehicles leaving the site do not deposit mud or other detritus on the public highway;
    ii. Details of site operative parking areas, material storage areas and the location of site operatives facilities (offices, toilets etc);
    iii. The hours that delivery vehicles will be permitted to arrive and depart, and arrangements for unloading and manoeuvring;
    iv. Details of any temporary construction accesses and their reinstatement; and
    v. A highway condition survey, timescale for re-inspections, and details of any reinstatement.

    Thereafter, the measures set out in the approved CEMP for highways shall be implemented and maintained for the duration of the development hereby approved.

11. No development hereby approved shall commence until a parking scheme including the specification, location and timetable for the provision of car parking, including the type and number of spaces, to be provided on site, at a gradient not exceeding 1 in 8, has been submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details and this area shall be retained for the purpose of vehicle parking only.

12. No development hereby approved shall commence until the specification, location and timetable for the provision of electric vehicle charging space(s) to be provided on site, has been submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details and the space(s) and power point(s) shall be kept available and maintained for the use of electric vehicles only.

13. No development hereby approved shall commence until details, location and a timetable for the provision of accessible car parking space(s) has been submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details and the spaces shall be kept available and maintained for use by disabled users only.

14. No development hereby approved shall commence until details, location and a timetable for the provision of sheltered and secure cycle parking to comply with Worcestershire County Council's Streetscape Design Guide shall be submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details and the cycle parking shall be kept available and maintained for use by bicycles only.

15. Prior to the commencement of the development hereby approved, full details of the wheel wash, together with water supply, water storage, recycling and disposal shall be submitted to and approved in writing by the Mineral Planning Authority. The wheel wash shall be implemented and operated in accordance with the approved details.

16. No HGVs shall enter the public highway from the site, unless their wheels and chassis have been cleaned in the wheel wash to prevent material being deposited on the highway.

17. All loaded vehicles entering and leaving the site shall be sheeted to prevent dust emission and spillage of materials on to the public highway.

18. Prior to the commencement of mineral extraction or importation of inert waste materials a scheme of positive and robust signage to help direct drivers to the site entrance and to alert other motorists to the potential of slow moving/ turning HGVs shall be submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details.

19. The intensity of sign illumination shall be controlled at a level that is within the limit recommended by the Institution of Lighting Professionals technical guidance note PLG05 "The brightness of illuminated advertisements" 2015 or in any document amending or superseding that report.

Boundary Treatment

20. Details of any new fences, walls and other means of enclosure shall be submitted to the Mineral Planning Authority for approval in writing prior to being erected. Thereafter the development shall be carried out in accordance with the approved details.

Lighting

21. Prior to commencement of the development hereby approved, a lighting design strategy shall be submitted to and approved in writing by the Mineral Planning Authority. The strategy shall include:

- Height of lights
- Intensity of the lights
- Spread of light in metres (Lux plan)
- Any measure proposed to minimise the impact of the lighting or disturbance through glare
- Times when the lighting would be illuminated; and
- Measures to minimise the impact of lighting upon protected species and habitats, including:
    - identifying those areas / features on site that are particularly sensitive for bats and invertebrates and that are likely to cause disturbance in or around their breeding sites and resting places or along important routes used to access key areas of their territory, such as for foraging
    - show how and where external lighting will be installed, through provision of appropriate technical specifications including optic photometric data and contour plans (in both horizontal and vertical planes), and glare rating, so that it can be clearly demonstrated that areas to be lit will not disturb or prevent the above species using their territory or having access to their breeding sites and resting places.

Thereafter, the development shall be carried out and maintained in accordance with the approved details. Under no circumstances shall any other external lighting be installed without prior consent from the Mineral Planning Authority.

Topographical Survey

22. A topographical survey of the site shall be carried out during the 12th month of extraction operations and shall be provided to the Mineral Planning Authority within two months of the survey date. Thereafter, the survey shall be carried out annually and supplied to the Mineral Planning Authority within two months of the survey date. Supplementary topographical surveys shall be undertaken upon the written request of the Mineral Planning Authority and supplied to the Mineral Planning Authority within two months of a written request. The survey shall be at a scale of 1:1250, with all levels related to Ordnance Datum. The surveys shall include the extent of land open for quarrying or undergoing restoration and quarry floor levels.

Water Environment

23. Notwithstanding the submitted details, no development shall commence until detailed design drawings for surface water drainage have been submitted to and approved in writing by the Mineral Planning Authority. Thereafter the development shall be carried out in accordance with the approved details.

24. No works in connection with site drainage shall commence until a Sustainable Drainage Systems (SuDS) Management Plan which shall include details on future management responsibilities, along with maintenance schedules for all SuDS features and associated pipework for their management and maintenance in perpetuity, has been submitted to and approved in writing by the Mineral Planning Authority. The Management Plan shall also detail the strategy that will be followed to facilitate the optimal functionality and performance of the SuDS scheme throughout its lifetime. Thereafter, the approved SuDS Management Plan shall be implemented in full and shall be managed and maintained in accordance with the approved maintenance plan.

25. There shall be no discharge of foul or contaminated drainage from the site into either groundwater or any surface water whether direct or via soakaways.

26. Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound shall be at least equivalent to the capacity of the tank, vessel or the combined capacity of interconnected tanks or vessels plus 10%. All filling points, associated pipework, vents, gauges and sight glasses shall be located within the bund or have separate secondary containment. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipework shall be located above ground and protected from accidental damage. All filling points and tank or vessel overflow pipe outlets shall be detailed to discharge downwards into the bund.

27. Prior to the commencement of the development hereby approved, details of pollution control measures, including pollution incident response procedures shall be submitted to, and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details.

28. Repair, maintenance and fuelling of vehicles, plant and machinery shall only take place on an impervious surface drained to a sealed interceptor and the contents of the interceptor shall be removed from the site.

Noise and Vibration

29. The development hereby approved shall be carried out in accordance with Section 6 of the Assessment of the Potential Noise Impact, dated 14 April 2021.

30. The noise attributable to mineral operations from the site shall not exceed the levels set out below at the receptor locations identified in the Assessment of the Potential Noise Impact, dated 14 April 2021 when measured in terms of an LAeq 1-hour level (free field):

- Fairview Lodge: LAeq, 1-hour 55dB
- Lower Madeley Farm: LAeq, 1-hour 48dB
- Oak Villa: LAeq, 1-hour 48dB
- The Cottage, Harbours Hill: LAeq, 1-hour 50dB
- Bringsty, Sandy Lane: LAeq, 1-hour 55dB
- Wildmoor Quarry property (Dolfor House): LAeq, 1-hour 55dB
- Farcroft: LAeq, 1-hour 55dB
- No. 1 Madeley Road: LAeq, 1-hour 55dB.

31. During the removal of soils and superficial deposits and the creation of any screen bunds or restoration works, the noise limit at the receptor locations identified in the Assessment of the Potential Noise Impact, dated 14 April 2021 shall not exceed 70dB LAeq 1-hour (free field) for a period of up to 8 weeks in any calendar year. Prior written notice of at least 5 working days, being Mondays to Fridays inclusive, shall be given to the Mineral Planning Authority of the commencement and the duration of such operations.

32. Within 21 days from receipt of a written request from the Mineral Planning Authority, the operator shall, at its expense, employ an independent qualified acoustic consultant to assess the noise impact from the development hereby approved upon the receptor locations identified in the Assessment of the Potential Noise Impact, dated 14 April 2021. The scope, methodology and timescales for delivery of the noise assessment shall be agreed in writing with the Mineral Planning Authority before assessment begins. Thereafter the noise assessment shall be completed in accordance with the agreed scope and shall be presented to the Mineral Planning Authority within the timescales for delivery.

33. Upon receipt of the independent consultant's noise assessment by the Mineral Planning Authority required under Condition 32) including all noise measures and any audio recordings, where the Mineral Planning Authority is satisfied of an established breach of noise limits set out in the Conditions 30) and / or 31), and upon notification by the Mineral Planning Authority in writing to the quarry operator, the quarry operator shall within 21 days propose a scheme of mitigation for the written approval of the Mineral Planning Authority. The scheme of mitigation shall be designed to mitigate the breach and to prevent its future recurrence. This scheme shall specify the timescales for implementation. Thereafter, the scheme shall be implemented in accordance with the approved details.

34. All vehicles, plant and machinery operated within the site shall be maintained in accordance with the manufacturers' specifications at all times, and this shall include the fitting and use of silencers. Except for maintenance purposes, no machinery shall be operated with its covers either open or removed.

35. All mobile plant, machinery and vehicles (excluding delivery vehicles which are not owned or under the direct control of the operator) used on the site shall incorporate white noise reversing warning devices.

36. Internal roads shall be maintained such that their surface remains in a good condition free of potholes or other defects.

Dust

37. The development hereby approved shall be carried out in accordance with Section 7 of the Assessment of the Potential Dust and Air Quality Impact, dated 19 May 2021.

Stockpiles

38. The height of any stockpiles of sand and gravel and inert waste restoration material shall not exceed 5 metres.

39. Soil handling and placement shall take place in accordance with the 'Good Practice Guide for Soil Handling' produced by Defra and only when the soils are dry and friable and in dry ground conditions.

40. Prior to the commencement of the development hereby approved, a scheme for seeding and management of all soil and overburden storage bunds that will remain in situ for more than 3 months or over winter shall be submitted to and approved in writing by the Mineral Planning Authority. Seeding and management of the storage bunds shall be carried out in accordance with the approved scheme.

Ecology

41. Notwithstanding the submitted details, prior to the commencement of the development hereby approved, including vegetation clearance, an invertebrates survey shall be submitted to and approved in writing by the Mineral Planning Authority. The supplementary survey shall be of an appropriate type for the invertebrate species and survey methods shall follow national good practice guidelines.

42. Notwithstanding the submitted details, prior to the commencement of the development hereby approved, including vegetation clearance, a detailed Construction Environmental Management Plan (CEMP) for biodiversity shall be submitted to and approved in writing by the Mineral Planning. The CEMP for biodiversity shall include the following:

i. Risk assessment of potentially damaging construction activities;
ii. Identification of "biodiversity protection zones";
iii. Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during quarrying (may be provided as a set of method statements;
iv. The location, timing and design of sensitive works to avoid harm to biodiversity features and priority species;
v. The times during construction when specialist ecologists need to be present on site to oversee works;
vi. Responsible persons and lines of communication;
vii. The role and responsibilities on site of a suitably competent Ecological Clerk of Works (ECoW); and
viii. Use of protective fences, exclusion barriers and warning signs.

Thereafter, the measures set out in the approved CEMP for biodiversity shall be implemented and maintained for the duration of the development hereby approved. On completion of the ecological works set out within the CEMP for biodiversity, a statement of conformity shall be submitted to the Mineral Planning Authority by the Ecological Clerk of Works confirming their successful implementation.

43. Notwithstanding the submitted details, prior to the commencement of the development hereby approved until an Ecological Design Strategy (EDS) addressing the agreed ecological mitigation, compensation and enhancement measures shall be submitted to and approved in writing by the Mineral Planning Authority. The EDS shall include the following:

i. Purpose and conservation objectives for the proposed works;
ii. Review of site potential and constraints;
iii. Detailed design(s) and/or working method(s) to achieve stated objectives;
iv. Extent and location/area of proposed works on appropriate scale maps and plans;
v. Type and source of materials to be used where appropriate, e.g. native species of local provenance;
vi. Timetable for implementation demonstrating that works are aligned with the proposed phasing of development;
vii. Persons responsible for implementing the works;
viii. Details of initial aftercare and long-term maintenance;
ix. Details for monitoring and remedial measures;
x. Details for disposal of any wastes arising from works; and
xi. A nesting bank could be provided, with details (including specification and exact location) submitted for approval within the Ecological Design Strategy.

The EDS shall be implemented in accordance with the approved details and all features shall be retained in that manner thereafter. A report describing the results of monitoring shall be submitted to the Minerals Planning Authority at intervals identified in the strategy. The report shall also set out (where the results from monitoring show that conservation aims and objectives are not being met) how contingencies and/or remedial action will be identified, agreed with the County Planning Authority, and then implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The monitoring strategy shall be implemented in accordance with the approved details.

Landscape

44. Notwithstanding the submitted details, prior to the commencement of the development hereby approved a Landscape and Ecological Management Plan (LEMP) and accompanying method statement detailing the creation and establishment of semi-natural habitats, trees, hedgerow, waterbody and scrub planting shall be submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the development shall be carried out in accordance with the approved details. The LEMP shall include the following:

i. Description and evaluation of landscape features and habitats to be managed and their design principles for biodiversity;
ii. Ecological trends and constraints on site that might influence management;
iii. Aims and objectives of management;
iv. Appropriate management options for achieving aims and objectives;
v. Prescriptions for management actions;
vi. Detailed designs and working methods necessary to achieve the stated objectives (species, provenance, numbers, density and planting/seeding methods of seed mixes, trees and shrubs to be used);
vii. Extent and location of proposed works shown on appropriate scale maps;
viii. Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period);
ix. Timetable for implementation;

x. Details of the body or organization responsible for implementation of the plan;
xi. Ongoing monitoring and remedial measures including details of Initial aftercare and long-term maintenance;
xii. Details of any legal and funding mechanism(s) by which the long-term implementation of the LEMP will be secured by the applicant with the management body(ies) responsible for its delivery; and
xiii. Where the results from monitoring show that conservation aims and objectives of the LEMP are not being met, the LEMP shall set out how contingencies and/or remedial action will be identified, agreed and implemented so that the development delivers the fully functioning biodiversity objectives of the originally approved scheme.

Thereafter the development shall be carried out in accordance with the approved details and implemented within the first available planting season (the period between 31 October in any one year and 31 March in the following year) on completion of the development. Any new trees or shrubs, which within a period of five years from the completion of the planting die, are removed, or become damaged or diseased, shall be replaced on an annual basis, in the next planting season with others of a similar size and species.

Restoration

45. Notwithstanding the submitted details, prior to the commencement of the development hereby approved, a detailed restoration scheme for the site shall be submitted to and approved in writing by the Mineral Planning Authority. The detailed restoration scheme shall include final contour levels, with all levels related to Ordnance Datum. Thereafter, the development shall be carried out in accordance with the approved scheme.

46. In the event that the winning and working of minerals ceases prior to the achievement of the completion of the approved restoration scheme referred to in Condition 45) of this permission which, in the opinion of the Mineral Planning Authority constitutes a permanent cessation, a revised scheme, to include details of restoration and aftercare, shall be submitted to the Mineral Planning Authority for approval in writing within 6 months of the cessation of the winning and working of minerals. The revised scheme shall be fully implemented within 12 months its approval in writing by the Mineral Planning Authority or such revised timescale as shall be determined by the Mineral Planning Authority. On completion of LEMP implementation, a brief Statement of Conformity will be issued to the County Planning Authority by a Suitably Qualified Ecologist or Environmental Manager.

47. In any part of the site where differential settlement occurs during the restoration and aftercare period, the applicant, where required by the Mineral Planning Authority, shall fill the depression to the final settlement contours specified with suitable imported soils, to a specification to be agreed with the Mineral Planning Authority.

Aftercare

48. The land within the application site shall undergo aftercare management for a 5-year period. Prior to any area being entered into aftercare the extent of the area and its date of entry into aftercare shall be agreed in writing with the Mineral Planning Authority.

49. Notwithstanding the submitted details, prior to the commencement of the development hereby approved, an outline aftercare scheme shall be submitted to and approved in writing by the Mineral Planning Authority to cover a period of 5 years. Such a scheme shall specify the steps which are to be taken to bring the land up to the required standard for the land uses shown on the restoration scheme, as required by Condition 45) of this permission.

50. A Detailed Aftercare Scheme shall be submitted to the Mineral Planning Authority for approval in writing at least 9 months prior to the anticipated completion date for each stage. The approved scheme shall include a programme of aftercare operations and management to be carried out in the forthcoming year; a review of the previous years' aftercare operations and management; confirm which steps specified in the Outline Aftercare Strategy shall be carried out as originally intended; and include any modifications to the approved Outline Aftercare Strategy proposals. Thereafter, the development shall be carried out in accordance with the approved details in accordance with the approved timetable, or as amended in consultation with the Mineral Planning Authority following each aftercare working group meetings.

Interpretation Strategy

51. Within 6 months of the commencement of the development hereby approved, an interpretation strategy for biodiversity and geodiversity shall be submitted to the Mineral Planning Authority for approval in writing. The Strategy shall include the content topic headings, concept design and location of any interpretation panels. Thereafter, the development shall be carried out in accordance with the approved details.

Permitted Development Rights

52. Notwithstanding the provisions of Class L of Part 7 and Class A and Class B of Part 17 of Schedule 2 of the Town and Country Planning (General Permitted Development) Order 2015 (as amended) (or any order revoking, re-enacting or modifying that Order), no fixed or mobile plant, machinery, buildings, structures, erections or private ways shall be erected, extended, installed, rearranged, replaced or altered within the site without the approval of the Mineral Planning Authority.

Other Matters

53. There shall be no crushing, screening, sorting or processing of any waste materials on the site.

54. No processing or treatment of mineral shall take place on the site.

55. The site shall not be open to the general public for commercial purposes.

56. No materials shall be burned on the site.

Local Liaison

57. No development shall commence until a scheme that sets out measures for liaison arrangements with the local community has been submitted to and approved in writing by the Mineral Planning Authority. Thereafter, the approved scheme shall be implemented for the duration of the development hereby approved.

Planning Permission

58. A copy of this decision notice, together with all approved plans and documents required under the conditions of this permission shall be maintained at the site office at all times throughout the duration of the development and shall be made known to any person(s) given responsibility for management or control of activities/operations on the site.

The reasons for the conditions are:-

1. Required to be imposed pursuant to Section 91 of the Town and Country Planning Act 1990.

2. To notify the Mineral Planning Authority when the development, soil stripping, mineral extraction and infilling operations commence and the completion of mineral extraction and infilling operations in each stage, for development monitoring purposes.

Reason for the pre-commencement condition: For proactive development monitoring purposes, to allow the Mineral Planning Authority to undertake site visits to prior to commencement of the development, before any operations on site commence.

3. For the avoidance of doubt, to define the permission and to ensure the satisfactory restoration of the site, in accordance with Policies WCS 5, WCS 9, WCS 11 and WCS 12 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan.

4. For the avoidance of doubt and to secure a satisfactory form of development.

5. & 55. To define the permission.

6. To ensure that the site is reclaimed in a condition capable of beneficial after use at an early date and in the interests of amenity, in accordance with Policies WCS 5, WCS 9, WCS 11 and WCS 12 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan.

7. To protect the water environment and prevent pollution, in accordance with Policy WCS 10 of the adopted Worcestershire Waste Core Strategy and Policy BDP23 of the adopted Bromsgrove District Plan.

8., 29., 30., 31., 32., 33., 34., 35., 36., 37., 53. & 56. To protect the amenity of the surrounding area, in accordance with Policy WCS 14 of the adopted Worcestershire Waste Core Strategy and Policy BDP19 of the adopted Bromsgrove Plan.

9. In the interests of highway safety, in accordance with Policy WCS 8 of the adopted Worcestershire Waste Core Strategy and Policy BDP16 of the adopted Bromsgrove District Plan.

10., 11., 12., 13., 14., 15., 16. & 17. In the interests of highway safety and to ensure the provision of adequate on-site facilities, in accordance with Policy WCS 8 of the adopted Worcestershire Waste Core Strategy and Policy BDP16 of the adopted Bromsgrove District Plan.

Reason for the pre-commencement condition (Condition 10.): The site's construction works are one of the first operations that will take place on the site, so it is important that the CEMP for Highways to prevent the deposit of mud and detritus on the public highway has been submitted to and approved prior to the commencement of the development, for the reasons stated above.

Reason for the pre-commencement condition (Conditions 11., 12., 13. & 14.): Details of car parking including accessible car parking facilities and vehicle charging points as well as cycle parking will be required to provide adequate and sustainable facilities for the visitors and employees from the beginning of the site operations.

Reason for the pre-commencement condition (Condition 15.): The details of wheel wash, water supply/storage facilities are required before operations on site commence to prevent the deposit of mud and detritus on the public highway.

18. & 19. In the interests of highway safety and to ensure the safe and free flow of traffic on the Strategic Road Network, in accordance with Policy WCS 8 of the adopted Worcestershire Waste Core Strategy and Policy BDP16 of the adopted Bromsgrove District Plan.

20., 21., 38., 44., 52. & 54. To protect the visual amenity of the site and environmental quality of the surrounding area, in accordance with Policies WCS 12 and WCS 14 of the adopted Worcestershire Waste Core Strategy and Policies BDP19 and BDP21 of the adopted Bromsgrove District Plan.

Reason for the pre-commencement condition (Condition 21.): Any lighting used on site can impact wildlife and visual amenity of the residents, therefore, the details of lighting scheme need to be approved before any operations on site commence.

Reason for the pre-commencement condition (Condition 44.): It is important that the LEMP is required at the outset of the development as the mineral extraction and importation of inert waste, together with vegetation clearance are one of the first operations that will take place on the site and have the potential to disturb flora and fauna. It is, therefore, critical a LEMP is in place for the reasons stated above.

22. To enable the Mineral Planning Authority to adequately control the development and to minimise its impacts on the amenities of the local area, in accordance with Policies WCS 12 and WCS 14 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan.

23., 24., 25., 26., 27. & 28. To protect the water environment and prevent pollution, in accordance with Policy WCS 10 of the adopted Worcestershire Waste Core Strategy and Policy BDP23 of the adopted Bromsgrove District Plan.

Reason for the pre-commencement condition (Condition 23.) The detailed design of the surface water drainage is required at the outset of the development as it may require to inform earlier stages of the operations.

Reason for the pre-commencement condition (Condition 27.) Pollution control measures, including pollution incident response procedures are required before operations on site commence to prevent pollution to the water environment.

39. & 40. To minimise damage to the existing soils and to ensure that the maximum depth of soils with high organic matter content, and a reservoir of nutrients is retained and kept available on site for restoration and infilling, in accordance with Policy WCS 5 of the adopted Worcestershire Waste Core Strategy.

Reason for the pre-commencement condition (Condition 40.): The creation of soil bund will be one of the first operations on the site. A scheme for seeding and management of all soil overburden storage bunds are required to ensure the quality of soils is maintained.

41., 42. & 43. To protect and conserve any statutory protected species and wildlife at the site, in accordance with Policy WCS 9 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan.

Reason for the pre-commencement condition (Condition 41.): An invertebrates survey is required prior to the development commencement including vegetation clearance to adequately consider risk of impact to invertebrate species and inform detailed design of the restoration strategy. This is particularly important as the phased extraction is likely to remove habitats for invertebrates for many years and therefore adversely impact multiple generations and potentially compromise ability of scarce invertebrates from recolonising restored habitats.

Reason for the pre-commencement condition (Condition 42.): The site's construction works are one of the first operations that will take place on the site and these have the potential to disturb protected species and habitats. Therefore, it is important that that the CEMP for biodiversity to control the construction impacts of the development have been submitted to and approved prior to the commencement of the development, for the reasons stated above.

Reason for the pre-commencement condition (Condition 43.): An Ecological Design Strategy is required before the development commencement in order to ensure that each habitat is adequately protected, compensated for or enhanced from the beginning of the operations.

45., 46., 47., 48., 49. & 50. To ensure the satisfactory restoration and aftercare of the site, in accordance with Policies WCS 5, WCS 9, WCS 11 and WCS 12 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan.

Reason for the pre-commencement condition (Condition 45.): A detailed restoration plan is required at the outset of the development as it may require to inform earlier stages of the operations taking into account matters such as ecology or flood risk mitigation.

Reason for the pre-commencement condition (Condition 49.): An outline aftercare scheme is required at the outset of the development as it may require to inform earlier stages of the operations taking into account matters such as ecology or flood risk mitigation.

51. In support of the environmental quality in accordance with Policy WCS 9 of the adopted Worcestershire Waste Core Strategy and Policy BDP21 of the adopted Bromsgrove District Plan

57. To protect the amenity of neighbouring residents, in accordance with Policy WCS 14 of the adopted Worcestershire Waste Core Strategy.

Reason for the pre-commencement condition: To enable the local community to be informed of each stage of the development.

58. To define the permission and to enable the monitoring of the consent in the interests of the amenity of the surrounding area, in accordance with Policy WCS 14 of the adopted Worcestershire Waste Core Strategy.

Reason(s) for Approval

The development falls within Schedule 2, Part 2 (a) 'Extractive industry: Quarries, open cast mining and peat extraction' of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (The EIA Regulations). The submitted Environmental Statement (ES), and Non-Technical Summary, and other information submitted to the Mineral Planning Authority together with the further environmental information in respect of the ES is considered sufficient to properly understand the proposals and assess their likely environmental effects.

As set out in the officer report to the Planning and Regulatory Committee relating to the determination of this application, the Mineral Planning Authority has considered the development against the relevant policies in the Development Plan, in particular Saved Policy 2 of the Adopted County of Hereford and Worcester Minerals Local Plan, Policies WCS 1, WCS 2, WCS 5, WCS 6, WCS 8, WCS 9, WCS 10, WCS 11, WCS 12, WCS 13, WCS 14 and WCS 15 of the Adopted Worcestershire Waste Core Strategy, and Policies BDP1, BDP4, BDP13, BDP15, BDP16, BDP19, BDP20, BDP21, BDP22, BDP23 and BDP24 of the Adopted Bromsgrove District Plan, and it is considered to be broadly in accordance with the National Planning Policy Framework and the Development Plan.

At the time of the decision, Worcestershire County Council did not have sufficient reserves of sand and gravel available with planning permissions to meet its annual provision requirements based on sales in accordance with the NPPF. The proposed development will increase the landbank by approximately 0.29 years, equating to a landbank of approximately 3.81 years in total, which is still below the minimum landbank for at least 7 years for sand and gravel.

The Mineral Planning Authority considered that on balance the proposed development accords with Saved Policy 2 of the adopted Minerals Local Plan.

It is considered that the applicant's approach to the consideration of alternatives is acceptable in this instance.

The proposal is located within the West Midlands Green Belt. It is considered that the exception for mineral extraction and engineering operations at Paragraph 150 of the NPPF apply in this instance, and the proposal is, therefore, not inappropriate development in the Green Belt.

The Mineral Planning Authority is satisfied that the development will not have an unacceptable impact upon traffic, highway safety or Public Rights of Way, subject to the imposition of conditions (Conditions 9 to 19).

It is considered that subject to the imposition of conditions that there will be no adverse air pollution (Condition 37), noise and vibration (Conditions 8 and 29 to 36), dust (Condition 15 to 17 and 37) or lighting impacts (Condition 21) on residential amenity.

It is considered that the proposal will not have an unacceptable impact upon the character and appearance of the local area and historic environment including archaeology subject to the imposition of appropriate conditions (Conditions 20, 44 to 50).

It is considered that subject to the imposition of conditions, that the proposal will have no adverse impacts on the ecology, biodiversity and geodiversity at the site or in the surrounding area, and will protect, conserve and enhance the application site's value for biodiversity (Conditions 21, 41 to 46 and 48 to 51).

The Mineral Planning Authority considered that there will be no adverse effects on the water environment, subject to the imposition of appropriate conditions (Conditions 23 to 28).

It is considered that in principle the restoration of the site by the importation of inert materials is acceptable in this instance. The ecologically led restoration of the site is considered acceptable, subject to the imposition of conditions (Conditions 45 to 50).

The Mineral Planning Authority considered that the proposal will provide substantial sustainable economic growth benefits to the local economy in accordance with the NPPF.

The various benefits of the development are not significantly and demonstrably outweighed by the adverse impacts and overall, the proposals are considered to represent sustainable development.

The Mineral Planning Authority in reaching a decision to grant planning permission has taken into account all of the environmental information submitted with it and in support of the application and all of the consultation responses and third-party public representations received. Overall, it is considered that there will not be any major adverse effects that cannot be adequately mitigated. Where necessary, adequate mitigation to avoid and reduce any adverse effects including but not limited to air quality and dust, noise, ecology and nature conservation, traffic and transport, landscape and visual impact, and water resources and flood risk, have been secured through the use of the planning conditions attached to this permission.

The public had opportunities to participate in the decision-making process through statutory and non-statutory consultations, through neighbour notifications, Public Notices erected on site and in the surrounding area and published in a local newspaper circulating in the locality in which the land

to which the application is situated, and on a website maintained by the Mineral Planning Authority. There were three rounds of public consultation in total taking place in August – September 2021, February – March 2022 and April – May 2022. For the consultation that took place August – September 2021, public consultation was undertaken in accordance with the Town and Country Planning (Development Management Procedure, Listed Buildings and Environmental Impact Assessment) (England) (Coronavirus) (Amendment) Regulations 2020, as the applicant was not able to make copies of an Environmental Statement available at a named address because it was not reasonably practicable to do so for reasons connected to the effects of coronavirus, including restrictions on movement. For this consultation, additional methods of consultation were undertaken including publishing details of the application on the County Council's social media accounts.

In response to the planning consultations, 6 letters of representation (2 commenting and 4 objecting) to the proposal were received by the Mineral Planning Authority, in relation to a number of matters including but not limited to adverse impacts upon: amenity, traffic and highway safety, the water environment, biodiversity and adverse pollution impacts. As set out above, where necessary, adequate mitigation to avoid and reduce any adverse effects have been secured through the imposition of conditions.

Positive and Proactive Statement

Worcestershire County Council works positively and proactively in order to determine planning applications in an efficient and effective manner and in accordance with the presumption in favour of sustainable development, as described in the National Panning Policy Framework.

In dealing with the application the County Council has worked with the applicant in the following way:-

Planning Officers communicated all consultee responses and letters of representation in a timely manner in order to address any material planning concerns raised. Planning Officers acted positively and proactively in discussing the planning process with the applicant. In addition, the draft conditions were shared with the applicant to ensure a satisfactory outcome for the applicant and the County Planning Authority.

Right to Challenge the Decision at the High Court

The general public does not have a right of appeal as such in respect of planning decisions, although persons aggrieved may have the right to challenge such decisions in the High Court. This process is known as Judicial Review and is a means for challenging the administrative decisions of local planning authorities. It is not really concerned about the merits of the decision reached as long as the appropriate procedure has been followed in reaching that decision.

The time limits for bringing such challenges are very strict, and applications need to be made as soon as possible after the issue of the decision notice and in any event within 6 weeks. So, if you think you may have grounds to challenge a decision by Judicial Review you are advised to seek professional advice as soon as possible.

These notes are provided for guidance only and apply to challenges under the legislation specified. If you require further advice on making an application for Judicial review, you should consult a solicitor or other advisor or contact the Crown Office at the Royal Courts of Justice, Queens Bench Division, Strand, London, WC2 2LL (0207 947 6000). Further information on judicial review can be found on the web site of the Judiciary for England and Wales (https://www.judiciary.gov.uk/you-and-the-judiciary/judicial-review/).

Notes

This permission does not authorise the applicant to carry out works within the publicly maintained highway since such works can only be carried out by the County Council's Approved Contractor, Ringway Infrastructure Service who can be contacted by email: worcestershirevehicle.crossing@ringway.co.uk. The applicant is solely responsible for all costs associated with construction of the access.

The granting of this planning permission does not remove any obligations on the applicant to undertake a technical design check of the proposed highway works with the County Highway Authority, nor does it confirm acceptance of the proposal by the County Highway Authority until that design check process has been concluded. Upon the satisfactory completion of the technical check the design would be suitable to allow conditions imposed under this permission to be discharged but works to the public highway cannot take place until a legal agreement under Section 278 of the Highways Act 1980 has been entered into and the applicant has complied with the requirements of the Traffic Management Act 2004.

The applicant is urged to engage with the County Highway Authority as early as possible to ensure that the approval process is started in a timely manner to achieve delivery of the highway works in accordance with the above-mentioned conditions. The applicant should be aware of the term "highway works" being inclusive of, but not limited to, the proposed junction arrangement, street lighting, structures and any necessary traffic regulation orders.

If it is the applicant's intention to request the County Council, as County Highway Authority, to adopt the proposed roadworks as maintainable at the public expense, then details of the layout and alignment, widths and levels of the proposed roadworks, which shall comply with any plans approved under this planning consent unless otherwise agreed in writing, together with all necessary drainage arrangements and run off calculations shall be submitted to the County Council's Network Control Manager, Worcestershire County Council, County Hall, Spetchley Road, Worcester, WR5 2NP. No works on the site of the development shall be commenced until these details have been approved by the County Council as County Highway Authority and an Agreement under Section 38 of the Highways Act, 1980, entered into.

The applicant must be aware of their obligations towards the Public Rights of Way as follows:

a. No disturbance of, or change to, the surface of the path or part thereof should be carried out without the Highway Authority's written

consent.

b. No diminution in the width of the right of way available for use by the public.
c. Buildings materials must not be stored on the right of way.
d. Vehicle movements and parking to be arranged so as not to unreasonably interfere with the public's use of the right of way.
e. No additional barriers are placed across the right of way. No stile, gate, fence or other structure should be created on, or across, a public right of way without written consent of the Highway Authority.
f. The safety of the public using the right of way is to be ensured at all times.

Where possible, the definitive line of public rights of way should be kept open and available for use throughout the construction phase. However, if public safety requires a temporary closure of a public right of way during works the appropriate application should be made to the Public Rights of Way Mapping Team at Worcestershire County Council at least 8 weeks prior to the earliest requested closure date.

If it is necessary to divert/extinguish/create public rights of way in order for the development to take place, this should be completed to confirmation stage before any development affecting the public right/s of way is started.

The applicant will require an Environmental Permit to authorise the landfilling operation proposed as part of the restoration of the site. The proposal also notes that sand will be extracted, but not processed on site. Any mining waste produced from this phase and deposited at the site would also be subject to authorisation via an Environmental Permit.

The proposed waste to be used in the landfilling phase is inert. The operator must ensure that all waste accepted at the site is suitable for use, and that a full 'WM3' assessment and Waste Assessment Criteria (WAC) tests have been completed and that these are shown to be compliant. As part of an application for an Environmental Permit, the operator will be required to submit their proposals for the landfill infrastructure, including groundwater monitoring regime, which may include a Construction Quality Assurance (CQA) plan. These aspects will eb secured and controlled through the permit. The landfill must have a geological barrier in place that extends along the base and sides of the site and provides a barrier to any emissions of contaminants. Where the operator intends to rely on the natural geology to form a barrier they must show that it is suitable and meets all of the relevant requirements. The Environmental Permit will likely require the operator to undertake regular monitoring of site emissions, including landfill gas. They should ensure that the infrastructure for this is installed at the site and maintained for the life of the Environmental Permit. All stored fuels and other potentially polluting liquids must be stored with adequate secondary containment, and where static storage is located, on an impermeable surface.

Cadent Gas Ltd own and operate the gas infrastructure within the area of your development. Prior to carrying out works, please register on www.linesearchbeforeudig.co.uk to submit details of the planned works for review, ensuring requirements are adhered to.

Appeal

If the applicant is aggrieved by the decision of the local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.

If you want to appeal against your local planning authority's decision, then you must do so within 6 months of the date of this notice.

Appeals must be made using a form which you can get from the Secretary of State at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN (Tel: 0303 444 5000) or online at https://acp.planninginspectorate.gov.uk

The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

If you intend to submit an appeal that you would like examined by inquiry then you must notify the Local Planning Authority and Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.UK.

Purchase Notices

If either the local planning authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that the owner can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (that is, where the land is situated in a National Park, the National Park authority for that Park, or in any other case the district council (or county council which is exercising the functions of a district council in relation to an area for which there is no district council), London borough council or Common Council of the City of London in whose area the land is situated). This notice will require the Council to purchase the owner's interest in the land in accordance with the provisions of Chapter I of Part VI of the Town and Country Planning Act 1990.

Appendix 3

Stability Risk Assessment, Key GS Limited, February 2021

Sandy Lane Quarry
Stability Risk Assessment
(February 2021)

Prepared for: NRS Waste Care Limited

Key GeoSolutions Ltd
Nova House
Audley Avenue Enterprise Park
Newport
Shropshire
TF10 7DW

Tel. 01952 822960
Fax. 01952 822961

email info@keygs.co.uk
web www.keygs.co.uk

Job Number: 21-063

Report Number: 21-063-R-001

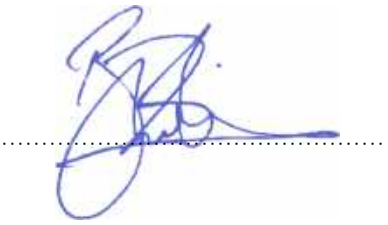
NRS Waste Care Limited

Sandy Lane Quarry

Stability Risk Assessment

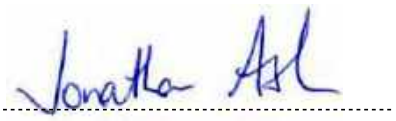
Prepared by:

B Duthie BEng CGeol FGS FIQ



Approved by:

J Ash BSc MSc CEng MIMMM FGS



Report Distribution List

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J Jessup				pdf	02	19/03/21			

CONTENTS

APPENDICES

DRAWINGS

1.0 INTRODUCTION

Key GeoSolutions Limited (KeyGS) have been commissioned by NRS Waste Care Limited (NRS) to undertake a stability assessment of the eastern quarry face of Sandy Lane Quarry in order to determine the likely long-term stability of the excavation and to identify the need for remedial works to ensure the stability.

The report provides an overview of the available data and a review of the existing ground conditions. A site visit was undertaken on 19th February 2021 to carry out an inspection of the current excavation.

2.0 SITE LOCATION AND HISTORY

The site is located approximately 5km to the north of Bromsgrove, 12km to the east of Kidderminster and 2km to the west north west of Junction 4 of the M5 motorway. It is located on the north east side of the roundabout on the junction of the A491 Sandy Lane and the B4091. The site is at National Grid Reference 394980mE 276290mN, see Figure 1 below.

The site covers an area of c. 5 hectares, with the A491 forming the southern boundary, Madeley Road the western boundary, to the north is agricultural land and to the east is a landfill site operated by Veolia. Infilling at the landfill site is complete and the site has been capped. A further operational quarry is located on the south side of the A491.

Figure 1 – Site Location

From OS maps it is apparent that quarrying started in the area at the turn of the 20th Century on a small scale, with more extensive working taking place from the 1950's onward. The area being considered by this report was worked in the 1990's, from the drawings produced for the landfill design it can be seen that the area had not been worked in 1991, see drawing 10547.G57/02 Site Survey, included at the back of this report. Landfilling operations at the Veolia site are now complete and the surface of the site has been restored.

The topographic survey of the quarry is shown on drawing number 21-063-D-001. The land surrounding the quarry falls in a westerly direction, from an elevation of c. 175mAOD on the east side

of the quarry to c. 165mAOD on the west side of the quarry. The quarry floor is at an elevation of 150mAOD at its deepest, which is in its south-eastern corner.

3.0 GEOLOGY

Geological Sheet No. 182 Droitwich shows the site to be underlain by the Wildmoor Sandstone Member (previously the Upper Mottled Sandstone) of the Wilmslow Sandstone Formation, which are described as silty or argillaceous, fine to medium grained, bright orange-red to dark brick-red sandstones, with subordinate siltstone and mudstone.

Boreholes drilled within the area of the Veolia landfill, locations shown on drawing number 21-063-D-001 and logs included as Appendix 1, confirm the BGS description, encountering generally a moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, sandstone with claystone interbeds to a depth of 50m, the base of the borehole being at a level of 104mAOD.

Photograph 1 – View of the Eastern Face looking North

A general view of the Eastern Face is shown on Photograph 1, it can be seen that the face has a reasonable cover of vegetation, with a thin ‘soil’ layer having developed on the surface of the face. Localised instability of the face was evident in the form of fresh scars, which represent shallow slips of material taking place, likely due to weathering processes. It is also evident from the profile of the slope that the sandstone is not a heterogeneous material, with preferential weathering taking place in the softer / weaker sandstone.

No groundwater monitoring information is available, however from photographic evidence it is likely that the groundwater level is around the level of the quarry floor, which tends to be dry in the summer and wet in the winter, hence it is assumed that the regional groundwater level is c. 150mAOD.

4.0 STABILITY ANALYSIS

Applied Geology drawing numbers 10547.G57/04 and 10547.G57/05 (included at the rear of this report) show the ground profile in the Veolia landfill area prior to construction of the landfill and the proposed cell wall profile. Section B-B is applicable to the eastern wall of Sandy Lane Quarry.

In combination with the topographic survey it has been possible to produce a cross-section through the eastern wall of Sandy Lane Quarry (the western wall of the Veolia landfill), which is included on drawing number 21-063-D-001. The exposed Wildmoor Sandstone face of the eastern side of the quarry excavation is at an average gradient of c. 60° from horizontal and is 22m high, above the sandstone face there is a section of slope which is 2 - 4m high and has a gradient of c. 1V in 2H (26°), this is assumed to represent the weaker, more soil like overburden materials. The completed landfill surface rises above this level in a dome shape at a gradient of the order of 1V in 10H.

The assumed parameters for the stability analysis are shown in Table 1.

Table 1 - Geotechnical Parameters Used in Analyses

Material Type	Effective Cohesion, c' (kN/m^2)	Angle of Shearing Resistance, Ø' (°)	Bulk Density (kN/m^3)	Typical Description
Landfill	5	25	12	
Landfill Side Walls	0	35	20	Recompacted Wildmoor Sandstone
Wildmoor Sandstone	50	35	22	Weak to moderately weak

The parameters selected are believed to be representative of the sandstone exposed in the face, however a slight variation in the parameters will have a significant influence on the results of the slope stability analysis. Using the parameters given in Table 1, stability analyses have been undertaken using the Rocscience SLIDE software, which is a limit equilibrium software program. The Factor of Safety given by the analysis for the sandstone face is of the order of 1.16 to 1.23.

5.0 DISCUSSION

The Factor of Safety calculated for the overall stability of the sandstone face could be considered appropriate for the temporary stability of a rock face in an operational quarry situation, however when it is considered that the wall of sandstone is supporting a domestic landfill and will have to remain stable effectively forever the Factor of Safety is too low. At the time that the design drawings for the landfill were produced the sandstone face did not exist and the area had not been quarried, no information has been provided as to whether the rock face was 'designed' and how long the design life was. The risk to the environment of the slope failing would be considered too high to allow any shorter design life to be considered.

In addition to the overall stability of the sandstone face the localised stability of the face also needs to be considered and needs to be considered in regard to two aspects;

- The impact on people who may be in the quarry
- The impact on the overall stability of the face

There will always be a risk that trespassers will enter the site, with a number of hazards being present that could affect their health and safety.

Photograph 2 – General view of the quarry, showing hazards such as high faces and standing water

Risk to trespassers will include, but not be limited to, material falling from the face and striking them, them falling from the crest of the face and drowning in standing water. Whilst a boundary fence is in place around the quarry it is not possible to prevent a determined trespasser from entering the quarry.

At present the localised instability of the face may appear to be having limited detrimental effect on the overall stability of the face however, it will serve in the long-term to reduce the effective width of the sandstone wall that is supporting the landfill. This will in turn result in a reduced Factor of Safety against failure and hence an increased risk of failure.

In order to ensure the long-term stability of the landfill it is proposed to buttress the sandstone face with inert infill. Doing this will remove all of the risks identified, namely;

- There will be no risk of failure of the landfill, with the overall slope stability ensured in the long-term.
- The risk to trespassers will be reduced, with no potential for shallow instability on the rock face or the potential for a person to fall from the crest of the face.

Consideration should be given to infilling the remainder of the site to a level where no high or steep faces exist at all and the potential for standing water will be removed.

APPENDIX 1

BGS Borehole Logs

SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 1 of 5

Sample No.	Fracture Index Tim	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			0	152.30	OPEN HOLE.		>.00 1.00
			1.00	151.30			
		100 (18) 0	1 1.50		Slightly to moderately weathered, weak to moderately weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE.	1.00-1.90 JOINT, orientation 0°-10°, rough, extremely narrow to tight, infilled with mica flakes.	1.10
		100 (25) 0	2 1.90				
				150.20	Weak, fissured, red brown, sandy, MARL, (very low plastic).	1.90-3.00 JOINT, orientation 0°-20°, planar, rough, very narrow, infilled with very stiff, red brown, low plastic, silty CLAY (MARL). 2.00 JOINT, orientation 70°, planar, rough, tight. 2.70 JOINT, orientation 80°, planar, rough, tight.	.80
		100 (83) 50	3 3.00				
		85 (20) 20	4 4.12		Slightly weathered, moderately weak, thinly bedded, light red brown to red brown, fine to medium, micaceous, SANDSTONE, with weak, medium bedded, bands of SANDSTONE.		3.95
		94 (67) 34	5 5.00 5.50	146.80		4.20-5.50 JOINT, orientation 15°, planar, rough, tight.	
		80 (44) 0	6 6.50		Slightly to moderately weathered, moderately weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE, with some pockets of very stiff, low plastic, fissured, CLAY (MARL) and grey fine SAND.	5.50-10.00 JOINT, orientation 0°-20°, planar and irregular, narrow to tight, infilled with very stiff, red brown, low plastic CLAY and some joints infilled with silvery MICA flakes.	3.36
		92 (76) 49	7 7.86	144.44			
		103 (13) 0	8 8.64		Slightly to highly weathered, weak, red brown, fine to medium, micaceous, SANDSTONE.		2.14
		100 (55) 40	9 10.00				

COMMENTS

Standpipe installed on 6-8-1991.
Borehole grouted up from GL to 44.0 mBGL.
Bentonite pellets seal from 44.0 to 45.2 mBGL.
Sand filter from 45.2 to 48.2 mBGL.
Response zone from 45.25 to 48.2 mBGL.

Printed Date:	06/11/91	Scale	1:50
Issue No.	01	Logged By: Date:	EBF 02/08/91
Revision No.	1	Checked By: Date:	FBC 01/09/91
Approved By: Date:		Approved By: Date:	

SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 2 of 5

Sample No.	Fracture Index f/m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			10.00	142.30			
		56 (44) 20	10		Slightly to highly weathered, weak, red brown, fine to medium, micaceous, SANDSTONE.	10.00-14.80 JOINT, orientation 15°, planar, rough, extremely narrow to tight.	4.84
					Slightly weathered, moderately weak, medium bedded, red brown, SANDSTONE.	10.85 JOINT, orientation 60°, planar, rough, tight.	4.80
			11.60	140.70			
		140 (22) 0	11		Very weak, red brown, fine to medium, SAND.	Disturbed core.	.90
			12.10	140.20			
		109 (82) 40	12				
			13.20				
		75 (50) 37	13		Slightly weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, degrading down to very weakly cemented SAND.	13.60 JOINT, orientation 60°, planar, rough, tight.	6.10
			14.80				
		96 (84) 62	15.00			14.80-16.20 JOINT, orientation 15°-25°, planar, rough, extremely narrow to tight.	
			14				
			16.20	136.10			
		92 (24) 14	15		Red brown, fine to medium, SAND.		1.00
				135.10	Slightly weathered, weak, medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.42
			17.62	134.68			
		88 (30) 13	16		Red brown, SAND.	The last 2 runs: The top end of the core is possibly disturbed (washed out) due to hydraulic extrusion.	.68
				134.00			
			18.87			18.30-20.39 JOINT, orientation 10°-15°, planar, rough, extremely narrow to tight.	
		102 (82) 66	17		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		3.53
			20.00				

COMMENTS STRATIGRAPHIC UNIT: UPPER MOTTLED SANDSTONE (WILDMOOR SANDSTONE)

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 02/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 3 of 5

Sample No.	Fracture Index (Fm)	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			20.00				
			20.39				
		75 (67) 25	18		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		0.82
			21.93	130.37			
		60 (0) 0	19		SAND.	Totally disturbed, very weakly cemented band of SAND (flushed out core).	1.60
			22.93	129.37			
		87 (35) 7	20		Slightly weathered, very weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE.	Core partly flushed.	1.50
			24.43	127.87			
		110 (0) 0	21		Slightly weathered, very weakly cemented, red brown, SAND.	Very poor recovery, due to very weakly cemented, loose sand.	1.60
			25.43	126.87			
				126.60	Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.33
				126.20	Very weakly cemented, red brown, SAND.	Cohesive behaviour of sample due to fine silt contents.	.40
		83 (44) 0	22		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	26.10-27.00 JOINT, orientation 20°, rough, extremely narrow to tight.	.84
			27.06	125.24			
		87 (9) 0	23		Loose, red brown, fine to medium, SAND.	Sand probably disturbed due to drilling.	1.50
			28.56	123.74			
				123.20	Slightly weathered, weak, red brown, fine to medium, SANDSTONE.	28.60-29.00 JOINT, orientation 15°, planer, rough.	.54
		87 (17) 0	24		Very dense, red brown, fine to medium, SAND.	Possibly disturbed due to drilling.	.96

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 05/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 4.56

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 4 of 5

Sample No.	Fracture Index /1m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			30.04	122.24	Very dense, red brown, fine to medium, SAND.		
		87 (0) 0	25	121.74	Slightly weathered, very weak, darkish red brown, fine to medium, SANDSTONE.		
			30.86	121.44	Moderately weak, light red brown, silty, MARL.		
		92 (0) 0	26				
			32.22				
		93 (42) 28	27		Slightly weathered, very weak to moderately weak, thinly bedded, red brown, fine to medium, SANDSTONE.	32.30-41.60 JOINT, orientation 10°-20°, planar, rough, extremely narrow to tight.	
			33.40				
		68 (0) 0	28			Disturbed core due to drilling in very weak sandstone.	
			34.72	117.58			
			35.00				
		100 (90) 75	29				
			37.53		Slightly weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.		
		85 (15) 15	30				
			38.70				
		93 (84) 53	31				
			40.00				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 06/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 5 of 5

Sample No.	Fracture Index /1m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			40.00		Slightly weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.		6.80
			41.60	110.70			
					Slightly weathered, very stiff, fissured, red brown, low plastic, MARL.		.40
				110.30			
		81 (16) 0	32		Slightly Weathered, very weak to weak, thinly bedded, red brown, fine to medium, sandy, SANDSTONE.		1.35
				109.20			
					Soft and stiff to very stiff, laminated, red brown, plastic, MARL.	Marl band at both sides covered with silty micaceous infill.	.25
			43.45	108.85			
					Slightly weathered, very weak to weak, medium bedded, red brown, fine to medium, SANDSTONE.		.75
				108.10			
		98 (73) 45	33		Very stiff, fissured, red brown, low plastic, MARL, with firm MARL interbedded.		.35
				107.75			
					Very stiff, red brown, sandy, silty, MARL, with very stiff, interlaminated, grey white, micaceous SILT.		.20
				107.55			
		93 (84) 53	45.00 31		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.	44.75-45.50 JOINT, orientation 15°, planar, rough, extremely tight.	.75
			45.50	106.80			
					Slightly weathered, very stiff, medium bedded, red brown, sandy, silty, MARL.		.20
				106.60			
						45.60-48.20 JOINT, orientation 15°, planar, smooth to rough, very to extremely narrow, infilled with red brown, laminated CLAY.	
		87 (81) 77	34		Slightly weathered, weak, medium bedded, red brown, SANDSTONE.		2.60
			48.20				
			50.00				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 06/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 1 of 5

Sample No.	Fracture Index /1m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			0	154.13	OPEN HOLE.		>.00
			1.00	153.13			1.00
		100 (85) 51	1		Moderately weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with a few little pockets of red brown, very stiff, CLAYSTONE, and with very stiff, thinly bedded, very low plastic, sandy, silty, CLAY bands, and with every 50cm, very weakly cemented, very thinly bedded, SAND.	1.00-7.13 JOINT, orientation 10°-25°, rough, extremely narrow to tight.	4.80
		88 (58) 43	2				
			5.00				
			5.60	148.53			
		98 (87) 86	3			5.70 JOINT, orientation 80°, planar, tight.	
			7.13				
		103 (82) 55	4		Moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with some small pockets of claystone, and with very weakly cemented, thinly interbedded, SAND.	7.13-10.50 JOINT, orientation 15°-25°, planar, rough, tight.	4.80
			8.63				
		88 (35) 32	5			9.00 JOINT, orientation 80°, planar, rough, extremely narrow.	
			10.00				

COMMENTS

Standpipe installed on 9-8-1991.
Borehole grouted up from GL to 47.00 mBGL.
Bentonite pellets seal from 46.00 to 47.00 mBGL.
Sand filter form 47.00 to 50.00 mBGL.
Response zone from 47.05 to 50.00 mBGL.

Printed Date: 06/11/91	Scale 1:50
Issue No. 01	Logged By: EBF Date: 08/08/91
Revision No. 1	Checked By: FBC Date: 01/09/91
Approved By: Date:	Approved By: Date:

SO 99NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 2 of 5

Sample No.	Fracture Index Per 1m	TCR (SCR) RQD	Depth (m) Core Run No.	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			10.00		Moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with some small pockets of claystone, and with very weakly cemented, thinly interbedded, SAND.		4.50
			10.50	143.63			
		92 (78) 56	6		Moderately weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with occasional pockets of clayey, silty sandstone, and with occasional pockets of very stiff, silty, low plastic, claystone.	10.50-11.70 JOINT, orientation 20°-30°, planar, rough, tight. 11.00 JOINT, orientation 25°, rough, moderately narrow, moderately weathered, infilled with very low plastic clay.	2.50
			11.70				
		108 (95) 84	7			11.70-16.06 JOINT, orientation 0°-20°, rough, very narrow to tight, infilled with clay or mica.	
			13.00	141.13			
		100 (85) 58	8				6.20
			14.58				
		101 (89) 78	9			15.00 JOINT, orientation 80°, planar, rough, tight.	
			16.06		Moderately weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		
		98 (80) 66	10			16.10-22.20 JOINT, orientation 0°-20°, planar, rough, tight.	
			12.70				
		97 (87) 41	11			18.10 JOINT, orientation 50°, planar, rough, tight.	
			19.20	134.93			
		103 (89) 32	12		Slightly to moderately weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		5.90

COMMENTS STRATIGRAPHIC UNIT: UPPER MOTTLED SANDSTONE (WILDMOOR SANDSTONE)

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 08/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 3 of 5

Sample No.	Fracture Index /1m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			20.00				
			20.70				
		100 (43) 21	13		Slightly to moderately weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	22.00 JOINT, orientation 80°, planar, rough, tight.	5.10
			22.20				
		100 (83) 37	14				
			22.80			22.80-24.30 JOINT, orientation 15°, planar, rough, tight.	
		87 (90) 47	15				
			24.30	129.83			
		83 (37) 14	16		Slightly weathered, very weakly cemented, thinly to medium bedded, red brown, fine to medium, SAND.	Disturbed core.	.70
			25.00	129.13	Slightly weathered, weak, thinly to medium bedded, red brown, SANDSTONE.	25.30 JOINT, orientation 75°, rough, 7.	.45
			25.45	128.68		25.45-30.10 JOINT, orientation 10°-40°, planar, rough, tight.	
		100 (92) 87	17		Slightly weathered, moderately strong, medium bedded, red brown, fine to medium, SANDSTONE.		1.50
			26.95	127.18			
		96 (65) 20	18		Faintly to slightly weathered, weak to moderately weak, very thinly to mainly bedded, red brown, fine to medium, SANDSTONE.		3.45
			28.55				
		90 (73) 26	19				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 09/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 4 of 5

Sample No.	Fracture Index (Fi/m)	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			30.10				
		100 (73) 29	20			30.10-37.95 JOINT, orientation 0°-25°, planar, rough, tight.	
			31.60				
		97 (87) 49	21		Faintly to slightly weathered, weak to moderately weak, very thinly to mainly bedded, red brown, fine to medium, SANDSTONE.		5.85
			33.15				
		78 (77) 41	22			33.90 JOINT, orientation 60°, planar, rough, tight.	
			35.00				
		100 (92) 66	23	118.73 118.63	Moderately weak, red brown, CLAYSTONE (MARL).		0.10
			36.45		Slightly weathered, weak to moderately weak, thinly to medium bedded, red brown to dark red brown, fine to medium, SANDSTONE.		1.50
		100 (79) 66	24	117.13 117.07	Very weakly cemented, thinly bedded, dark red brown, medium grained, SAND.		0.06
			37.95			37.75 JOINT, orientation 50°, irregular, rough, tight.	
		97 (69) 41	25		Slightly weathered, moderately weak, thinly to medium bedded, light to dark red brown, fine to medium, micaceous, SANDSTONE, with at 40.65 pockets of loose, uncemented, mica and sand.	37.95-45.76 JOINT, orientation 10°-15°, planar, rough, tight.	5.46
			39.55			39.00 JOINT, orientation 90°, planar, rough, tight, 30cm long.	
		85 (67) 81	26				
			40.00				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 09/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 5 of 5

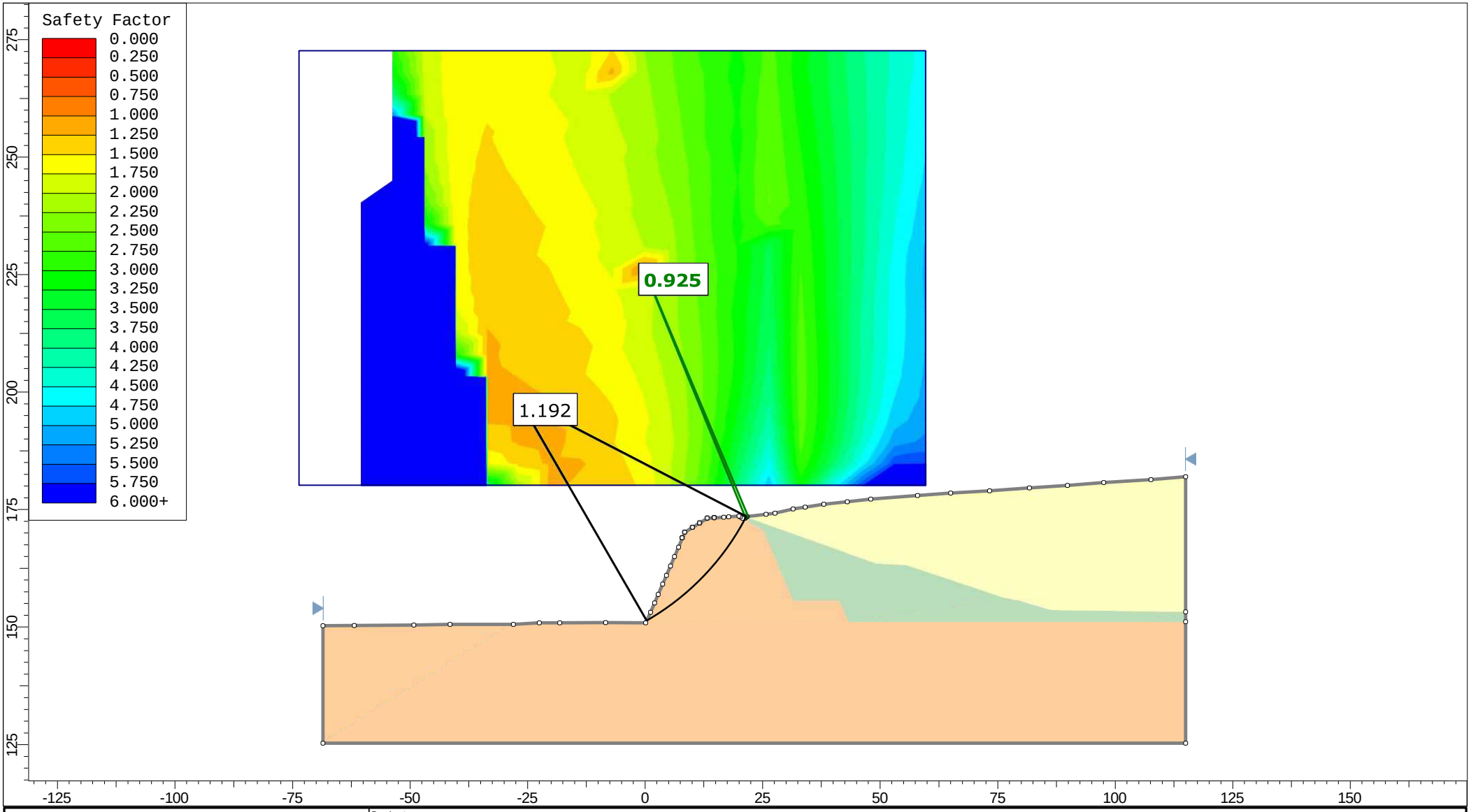
Sample No.	Fracture Index Type	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			40.00				
					Slightly weathered, moderately weak, thinly to medium bedded, light to dark red brown, fine to medium, micaceous, SANDSTONE, with at 40.65 pockets of loose, uncemented, mica and sand.	40.70 JOINT, orientation 60°, planar, rough, extremely narrow, infilled with mica flakes.	2.42
			42.55	111.58			
					Slightly weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.45
				111.13			
					Very stiff, thinly bedded, red brown, very low plastic, CLAYSTONE (MARL).	Marl between thin bands of very stiff, sandy clay.	.90
		89 (64) 39	27	111.03			
			44.35				
		92 (88) (84) 81	28 28		Slightly to moderately weathered, moderately strong, thinly to medium bedded, red brown to dark red brown, fine to medium, micaceous, SANDSTONE.		3.10
			45.76				
				107.93			
					Weak, medium bedded, dark red brown, medium, very micaceous, SANDSTONE.		.60
				107.53			
		96 (71) 50	29		Moderately weathered, moderately strong, medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	47.20 JOINT, orientation 85°, planar, rough, tight.	.70
				106.83			
					Very stiff, thinly bedded, red brown, very low plastic, very sandy, MARL.	47.40-49.00 JOINT, orientation 10°-15°, planar, rough, extremely narrow to tight.	.70
				106.73			
			48.00				
					Slightly to moderately weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		1.60
		75 (45) 30	30	105.13			
					Very weakly cemented, medium bedded, red brown, SAND.		.40
				104.73			
					Very stiff, thinly bedded, very low plastic, sandy, MARL.		.10
				104.63			
				104.33			
					Moderately strong, thinly bedded, fine to medium, SANDSTONE.		.30
			50.00				

COMMENTS

Printed Date:	06/11/91	Scale	1:50
Issue No.	1	Logged By: Date:	EBF 09/08/91
Revision No.		Checked By: Date:	
Approved By: Date:		Approved By: Date:	

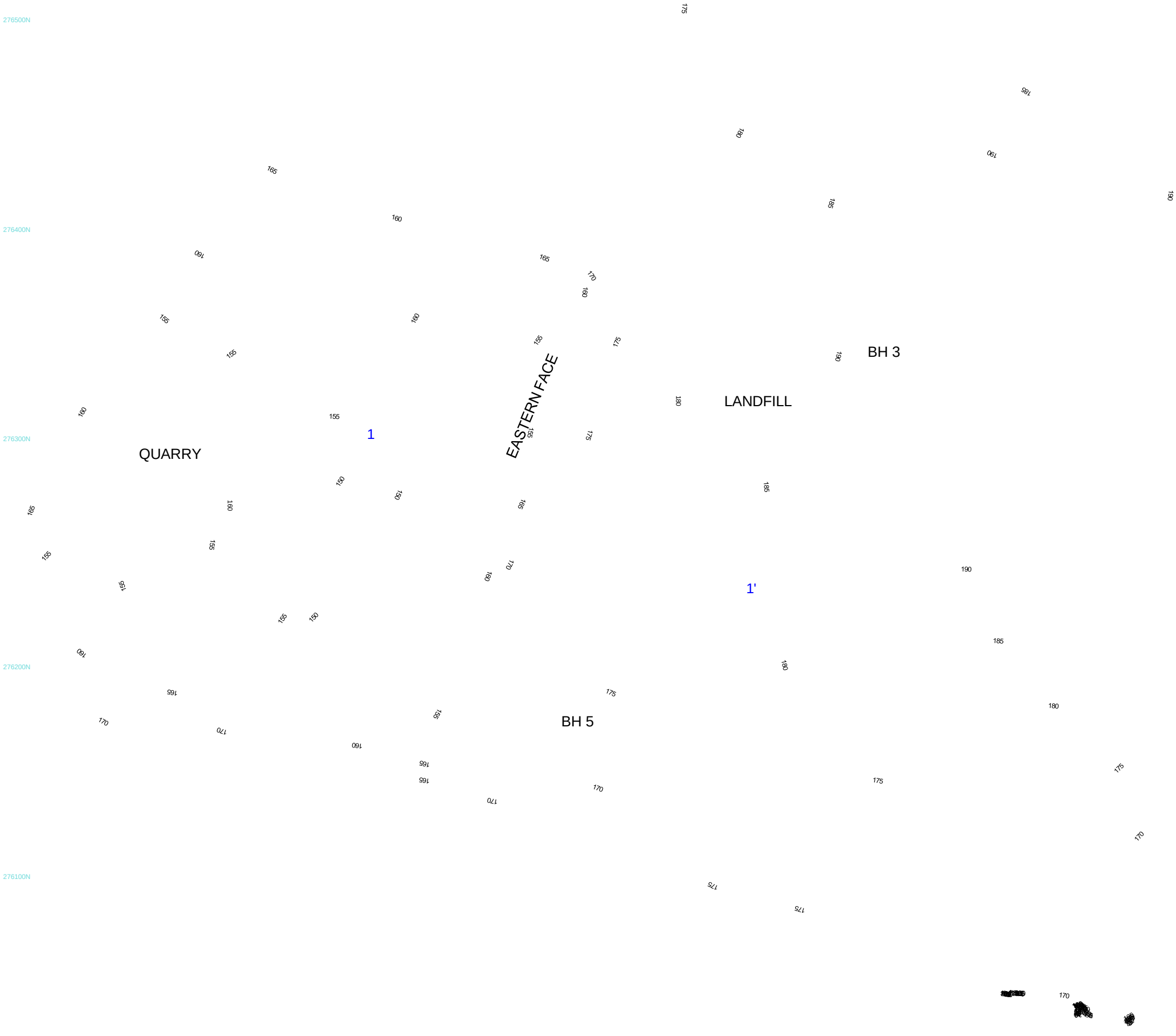
APPENDIX 2

Stability Analyses



rocscience	Project	SLIDE - An Interactive Slope Stability Program	
	Group	Sandy Lane - Stability Analysis.slim	Scenario: Sandy Lane - Stability Analysis.slim
	Drawn By		Company
SLIDEINTERPRET 9.012	Date	21/02/2018, 10:40:14	File Name: Sandy Lane - Stability Analysis.slim

DRAWINGS



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158.0
156.0
154.0
152.0
150.0

PRE-QUARRYING GROUND PROFILE

148.0
146.0
144.0
142.0

CURRENT QUARRY TOPOGRAPHY

LANDFILL

PRE-LANDFILL GROUND SURFACE

SECTION 1 - 1'

CLIENT:

PROJECT:
SANDY LANE QUARRY
STABILITY ASSESSMENT
OF EASTERN FACE

TITLE:
PLAN AND CROSS SECTION

Nova House

394900E 395000E 395100E 395200E 395300E 395400E

enue

Drawn: WR | Checked: BD | Date: FEB '21

Newport
Shropshire TF10 7DW

Scale: PLAN 1:2000
SECTION 1:1000

Original Sheet Size: A3

Status: DRAFT

Tel: 01952 822960
E-mail: info@keygs.com

Drawing No.

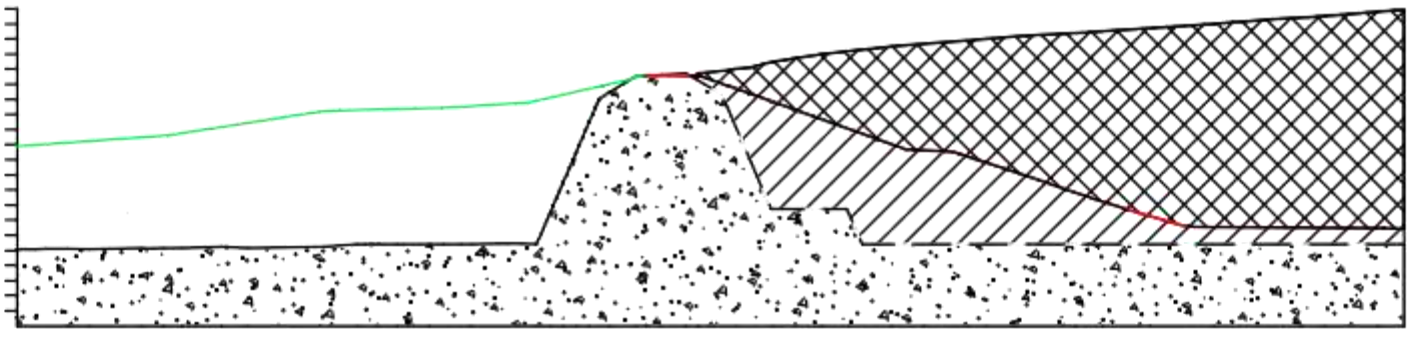
Revision:

Rev.	Revision Detail	Drawn	Date
01	First Issue	WR	25/02/21

Key GeoSolutions Ltd

Web: www.keygs.com

21-063-D-001 **01**

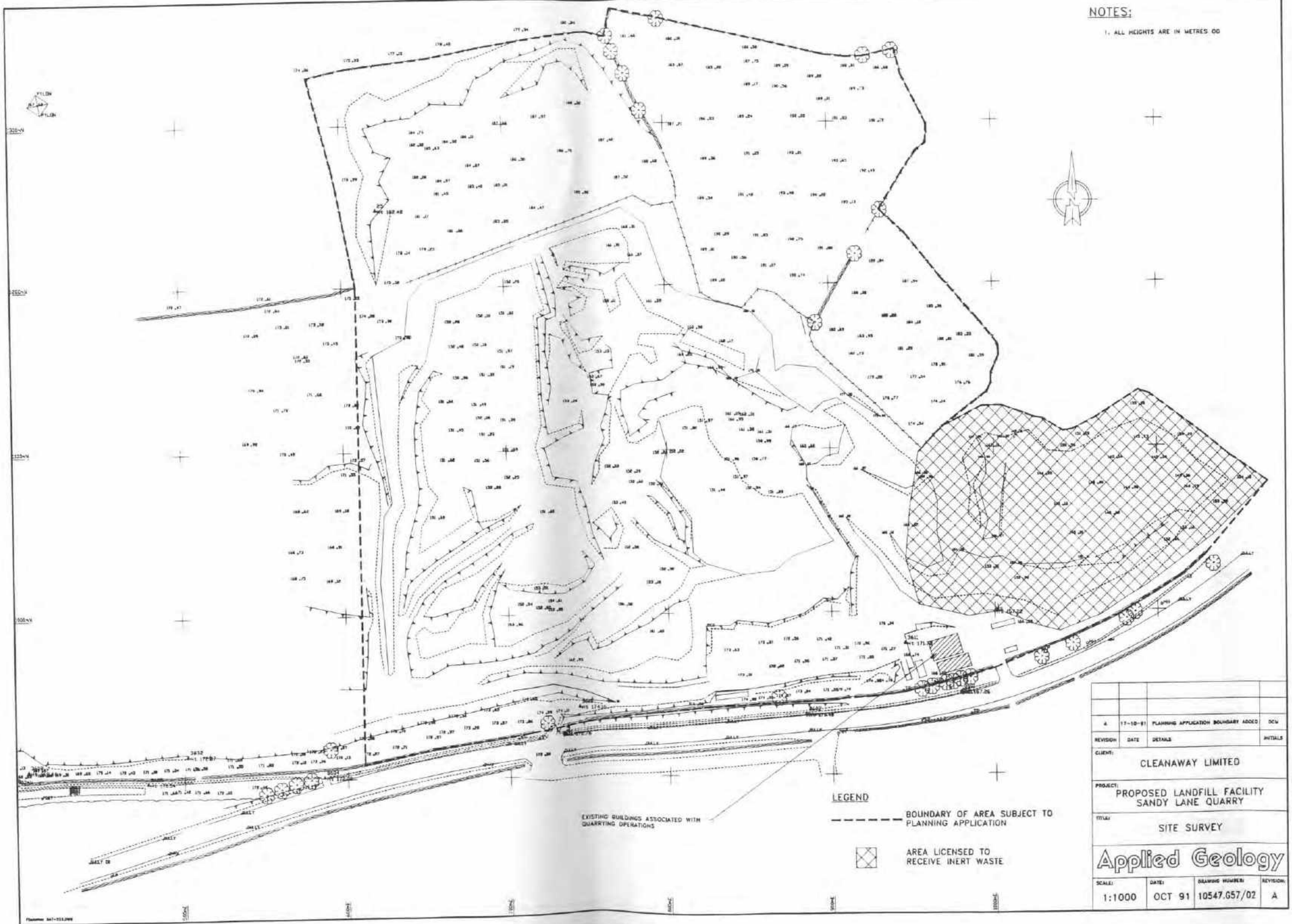


WasteCare Ltd

KEY | GS

NOTES:

1. ALL HEIGHTS ARE IN METRES OD



LEGEND

BOUNDARY OF AREA SUBJECT TO PLANNING APPLICATION

AREA LICENSED TO RECEIVE INERT WASTE

A	17-10-91	PLANNING APPLICATION BOUNDARY ADDED	DCW
REVISION	DATE	DETAILS	INITIALS

CLIENT: CLEANAWAY LIMITED

PROJECT: PROPOSED LANDFILL FACILITY SANDY LANE QUARRY

TITLE: SITE SURVEY

Applied Geology

SCALE:	DATE:	DRAWING NUMBER:	REVISION:
1:1000	OCT 91	10547.G57/02	A

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NUMBER 10547.057/08

PHASE A

PHASE B

LEGEND:

BOUNDARY OF AREA SUBJECT TO PLANNING APPLICATION

REVISION	DATE	DETAILS	INITIALS
A	17-10-91	SIDE ROAD REMOVED PLANNING APPLICATION BOUNDARY ADDED	DCM

CLIENT: CLEANAWAY LIMITED

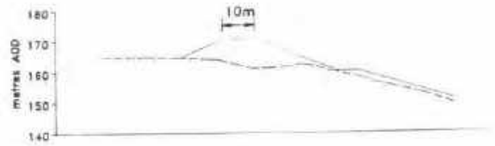
PROJECT: PROPOSED LANDFILL FACILITY SANDY LANE QUARRY

TITLE: ENGINEERING DESIGN – PLAN

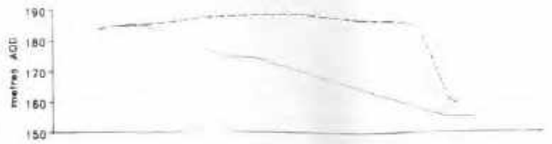
Applied Geology

SCALE:	DATE:	DRAWING NUMBER:	REVISION:
1:1000	OCT 91	10547.057/04	A

Filename: 547-108.DWG



SECTION A–A

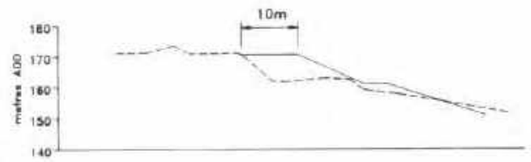


SECTION E–E

SECTION I–I

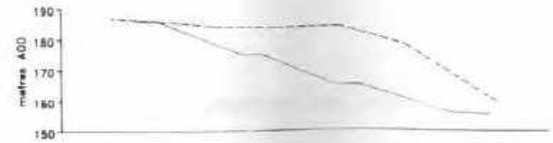
SECTION B–B

SECTION F–F



SECTION J–J

SECTION C–C



SECTION G–G

SECTION D–D

SECTION H–H

Filename: 547-109.DWG

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NUMBER 10547.057/04
2. ALL HEIGHTS ARE IN METRES OD

LEGEND:

------ EXISTING GROUND PROFILE

——— PROPOSED GROUND PROFILE

SLOPE GRADIENTS:

BASE TO FIRST BERM 1:3
ABOVE FIRST BERM 1:2.5

BERM WIDTH 7M UNLESS INDICATED

REVISION	DATE	DETAILS	INITIALS
A	17-10-91	NOTES ADDED	DCM

CLIENT: CLEANAWAY LIMITED

PROJECT: PROPOSED LANDFILL FACILITY SANDY LANE QUARRY

TITLE: ENGINEERING DESIGN – CROSS SECTIONS

Applied Geology

SCALE:	DATE:	DRAWING NUMBER:	REVISION:
1:1000	OCT 91	10547.057/05	A

Appendix 4

Environment Agency advice on Waste Recovery Plan Version 1

From: Franklin, Selina <selina.franklin@environment-agency.gov.uk>
Sent: Wednesday, 5 January 2022 17:13
To: Kate Brady <kateb@westburyenv.co.uk>
Subject: RE: Sandy Lane Quarry EPR/KB3801TP/A001

Hi Kate,

I have now completed my assessment of the Waste Recovery Plan for Sandy Lane Quarry EPR/KB3801TP/A001 and attach the letter confirming our decision.

We agree that the retained conditions 12 and 13 within the lapsed Review of Old Mineral Planning Permissions (ROMP), dated 20th March 2000, do provide a general obligation to restore the site to agriculture. However, we are unable to agree recovery at this time as the planning permission for the activity has not yet been granted. We will in due course, need to check any planning permission granted to ensure that there is nothing in the permission which conflicts with the Waste Recovery Plan or puts a decision of recovery at risk. The planning permission is likely to approve cross section drawings, contour drawings, etc and we are unable to give a decision of recovery until we are sure of what has been set within the planning permission. We understand that a planning permission application was submitted in August 2021 and having checked the status of the application, a Regulation 25 request for further information was issued on 29 October 2021.

This pre-application assessment of the Waste Recovery Plan is now complete. Once the planning permission has been granted the applicant should submit a further request for assessment, including the planning permission/ reference and a new fee. If the Waste Recovery Plan has not been revised so that it no longer meets the recovery tests, and the planning permission is in line with the Waste Recovery Plan, it is likely we will be able to agree that this is a recovery activity. If you'd like to note my name in your re-submission email, I will be happy to pick it up again once you have the planning permission.

Kind regards,
Selina

Selina Franklin BSc (Hons)
National Permitting Officer
National Permitting Service
Regulated Industry Permitting (waste)
Environment Agency
selina.franklin@environment-agency.gov.uk

Westbury Environmental
Agriculture House
Southwater Way
Telford
Shropshire
TF3 4NR

Our ref: EA/EPR/KB3801TP/A001
Your ref: EA/EPR/KB3801TP/A001

Date: 05/01/2022

Dear Kate Brady,

Environmental Permitting – Recovery or Disposal Operation
Pre-application Reference: EA/EPR/KB3801TP/A001
Proposed Operator: NRS Bromsgrove Aggregates Ltd
Regulated facility: Sandy Lane Quarry
Site Address : Sandy Lane, Wildmoor, Bromsgrove, Worcestershire B61 0QT

As part of our pre-application discussions, you have submitted information to us that includes your assessment that the activity you wish to undertake at your site amounts to a recovery operation.

We have now fully considered your submission and we would like to advise you that:

We do not agree with your assessment that your activity is a recovery operation for the following reasons: Not enough evidence has been provided to support the case that the proposed activity is a recovery operation and therefore we cannot confirm that this is a recovery operation. Please see the email for further information about the planning permission.

You may still apply for a recovery permit, however if you are unable to provide further evidence that supports your claim that the activity is a recovery operation, then the application is likely to be refused. If this happens you will lose your application fee. If your application is refused you have the right to appeal that refusal.

If you have any questions please phone me or email NAME@environment-agency.gov.uk

Yours sincerely,

Selina Franklin

Permitting Officer

Appendix 2

Environmental Risk Assessment

Data and Information				Judgement				Action (By Permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of Exposure**	**Consequence**	**Magnitude of Risk**	**Justification for Magnitude**	**Risk Management**	**Residual Risk**
Local human population – Residential dwellings located within the vicinity of the Site. Nearest residential dwelling Stoney Bridge Estate; 20m west.	Releases of dusts and micro-organisms (bioaerosols)	Harm to human health - respiratory irritation and illness	Air transport then inhalation	Medium	Medium	Medium	Permitted waste types are inert and non-hazardous and do not comprise solely of dusts, powders or loose fibres. Permitted wastes have a very low potential to produce bioaerosols. There is potential for dust emissions from the movement of material and vehicles, particularly during prolonged dry periods. Treatment activities may produce dust emissions. Dust from the deposit and treatment of soil and stones are likely to comprise predominately of PM10 (larger sized) particles. It is considered that most of the dust is likely to be deposited within 50m of the source. The nearest residential dwelling	A number of mitigation measures will be implemented to reduce the risk of dust emissions. Vehicles entering and exiting the site will be sheeted. Strict waste acceptance procedures will be employed to ensure that loads comprising mainly dust, fibres or loose fibres are not accepted. Waste operations that have the potential to generate dust e.g., crushing, screening and tipping will be subject to water sprays for dust suppression. Waste handling will be within the quarry void, below the surrounding ground level, reducing the risk of dust leaving the Site.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
							is Stoney Bridge Estate located approximately 20m west of the Site. Stoney Bridge is the only residential dwelling receptor located within 50m of the Site. The predominant wind direction blows towards receptors to the northeast of the Site and therefore the dwelling at Stoney Bridge is generally upwind of the Site. The works will be phased, minimising the duration and surface area over which materials movement will occur at any one time/location.		
		Nuisance - dust on cars, clothing etc.	Air transport then deposition	Medium	Low	Low	As above.	As above.	Low
Nearby highways Sandy Lane 5m south and Madeley Rd 10m west. Stoney Bride Estate dwellings 20m west.	Litter	Nuisance, loss of amenity and harm to human health	Air transport then deposition	Low	Medium	Low	Areas of deciduous woodland located close to the Site may be sensitive to litter. Permitted waste types have a low	Any litter found will be collected and disposed of regularly to keep the Site tidy. Strict waste acceptance criteria will be applied within the Environmental Management System	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
Residence off Madeley Rd 55m north. Nearby habitats Deciduous woodland 360m east.							potential to produce litter.	(EMS) to ensure incoming loads of waste that have a high litter content are rejected.	
Local human population. Nearest residential dwelling Stoney Bridge Estate; 20m west. Workers at Wildmoor Quarry 25m south, Accumix Concrete Ltd 140m south, and LJ Beauty Clinic 295m north. Sandy Lane (A491) 5m south, Madeley Road 10m west, and Harbours Hill 265m northeast.	Waste, litter, and mud on local roads.	Nuisance, loss of amenity, road traffic incidents, potential for resuspension of dust.	Vehicles entering and leaving the site.	Medium	Medium	Medium	Local residents are often sensitive to waste, litter, mud on roads. Permitted waste types have a low potential to produce litter. Material movement via HGV has the potential to track mud onto the public highway.	There will be wheel cleaning facilities to wash mud off vehicles exiting the Site. The site will have access to a road sweeper to deploy in the event that mud is observed on the adjacent highways. Requirements of the EMS procedures ensure that the internal and external haul routes will be inspected regularly (Site Inspection checklists) to ensure any mud is cleared up in a timely manner.	Low
Local human population. Nearest residential dwelling Stoney	Odour	Nuisance, loss of amenity	Air transport then inhalation	Low	Low	Low	Local residents often sensitive to odour, however permitted waste types have a low potential to give rise to odour.	Waste imported onto the Site will be checked to ensure that it does not contain malodourous materials. This is controlled by the Waste Acceptance Procedures.	Very low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
Bridge Estate; 20m west. Workers at Wildmoor Quarry 25m south, Accumix Concrete Ltd 140m south, and LJ Beauty Clinic 295m north.	Noise and vibration	Nuisance, loss of amenity, loss of sleep	Noise through the air and vibration through the ground	Low	Medium	Medium	Local residents are often sensitive to noise and vibration. The proposed waste treatment activities have the potential to create noise emissions. The deposition of materials by HGV are considered to be of equal or lesser noise potential as quarrying operations which have already taken place at the Site. Nearest residential dwelling is Stoney Bridge Estate, 20m west. Although the dwelling is close to the site, waste deposit activities will be set below surrounding ground level. The difference in elevation (14m) will act as an effective screening bund to shield from noise and dust for much of the works. The activity closest to Stoney Bridge Estate will be the building of the	All plant and equipment will be maintained in accordance with the manufacturers' recommendations to minimise noise generation. Phased restoration of the site reduces potential for the time and intensity of potentially noise generating activities being carried out/ adversely impacting nearby receptors. All noise mitigation measures are designed to ensure the Operator complies with the noise limits stated within the planning permission. These are controlled by the planning permission.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
							screening bund in Phase 1. The construction of this bund has potential to cause some disruption for the brief construction period. However the bund will then screen receptors from further disturbances. It is considered likely that the noise generated from Sandy Lane A491 (5m south), is likely to equal or exceed noise generated from the waste operations carried out at the Site at nearby receptors.		
Local human population. (As above)	Scavenging animals and scavenging birds	Harm to human health - from waste carried off site and faeces. Nuisance and loss of amenity	Air transport and over land	Low	Medium	Low	Permitted waste types unlikely to attract scavenging animals and birds but may become breeding / nesting sites.	Implementation of strict waste acceptance procedures will ensure that only permitted wastes are accepted. Regular housekeeping will minimise the risk from scavenging animals.	Very Low
	Pests (e.g., flies)	Harm to human health, nuisance, loss of amenity	Air transport and over land	Low	Medium	Low	Permitted waste types unlikely to attract pests. The permitted waste types are not putrescible.	As above.	Very Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
Nearest residential dwelling Stoney Bridge Estate; 20m west. Deciduous woodland 360m east. Silt Settlement Lagoons 420m east.	Flooding of site	Run off produced from the Site	Flood waters	High	Low	Medium	Permitted waste types are inert and non-hazardous so any waste washed off Site will add to the volume of the local post-flood clean-up workload, rather than the hazard. However, as site is a quarry, wastes are unlikely to be carried off site. The site is designated as being in a Flood Zone 1 for risk of flooding from rivers or seas. Flood Zone 1 means it is at very low risk of flooding from rivers and seas. An isolated part of the centre of the Site void is considered to be in a high risk area from surface water flooding (<0.9m depth). The modelled depth of floodwater does not extend to surrounding ground level.	Any liquids shall be provided with secondary containment. Fuels and oils will be stored appropriately within areas of the Site not at risk of flooding. Waste accepted to the site will be controlled by strict waste acceptance procedures.	Very Low
Local human population and / or livestock after gaining	All on-site hazards: wastes,	Bodily injury	Direct physical contact	Low	High	Medium	Equipment and machinery located on the Site are secured outside of	The Site will be manned during operational hours or when the Site entrance is unlocked.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
unauthorised access to the Site	machinery, and vehicles						operational / manned hours. The site is secured by perimeter hedgerows, fencing and a lockable gated entrance.	Vehicles will not be left unattended when unsecured. All plant will be maintained in line with manufacturers recommendations.	
Local human population. Nearest residential dwelling Stoney Bridge Estate; 20m west. Sandy Lane (A491) 5m south. Madeley Road 10m west.	Arson and / or vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness, and nuisance to the local population. Injury to staff, firefighters, or arsonists / vandals. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from site and via surface water drains and ditches	Low	Low	Low	As above plus: Permitted waste types do not include any flammable materials so a low magnitude of risk is estimated.	As above.	Very low
	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness, and nuisance to the local population. Injury to staff or firefighters. Pollution of water or land.	As above.	Low	Low	Low	Permitted waste types do not include any flammable materials so a low magnitude of risk is estimated. Permitted activities do not include the burning of waste. Any fuels/oils on Site will be stored in accordance with the Oil regulations and secured.	As above. Any liquids shall be provided with secondary containment. Regular checks on fuel/oil storage in accordance with Site inspection checklists in the EMS.	Very low
All surface waters close to	Spillage of liquids, leachate	Acute effects: oxygen depletion, fish	Direct run-off from site across	Medium	Medium	Medium	Permitted waste types will not include sludges or	Any liquids shall be provided with secondary containment. Wastes from	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
and downstream of Site - Silt settlement Lagoons 420m east.	from waste, contaminated run-off from waste e.g., containing suspended solids	kill and algal blooms. Chronic effects: deterioration of water quality	ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer.				liquids so only a low magnitude risk is estimated. There are no point source emissions to surface water nor any surface water features within 400m of the Site. Waste types are inert and non-hazardous, so harm is likely to be temporary and reversible.	potentially contaminated sites require analysis. Strict waste acceptance procedures will ensure that only permitted waste is accepted to the Site.	
Groundwater – The Site is in a groundwater Source Protection Zone 3- total catchment.	Spillage of liquids, leachate from waste, contaminated run-off from waste e.g., containing suspended solids	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole	Transport through soil / groundwater then extraction at borehole.	Low	Medium	Medium	The site overlies a Principal Aquifer. The Site is located in Groundwater Source Protection Zone 3 and is reported to be in an area of high groundwater vulnerability. Waste types are inert and non-hazardous, so harm is likely to be temporary and reversible. The Site will include an engineered barrier to prevent migration of water	Strict waste acceptance procedures will ensure that only inert waste is accepted to the Site. The Hydrogeological Risk Assessment confirms that the proposed barrier mitigation mean the wastes to be deposited will not pose an unacceptable risk to controlled waters. The HRA also sets out a proposed scheme of groundwater monitoring.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
							through deposited wastes.		
Protected sites - European sites and SSSIs Deciduous woodland 360m east. Madeley Heath Pit SSSI, 825m northeast	Any	Harm to protected site through toxic contamination, nutrient enrichment, smothering, disturbance, predation etc.	Any	Medium	Low	Medium	Waste operations may cause harm to and deterioration of nature conservation sites. Dust is unlikely to travel more than 50m from the Site. The closest habitat is deciduous woodland >350m east. Any dust impacts would be temporary and reversible.	Adherence to the Dust Management Plan (part of the EMS) will ensure dust emissions will be minimised such as not to cause adverse impact to the protected woodland.	Low
Local human population and local environment.	Build up and emissions of gas from adjacent historic waste deposits within the permitted site	Respiratory irritation, illness, and nuisance to local population. Risk of explosion and injury to staff and local population.	Gas migrating laterally through waste deposit and building up in certain areas.	Low	High	Medium	Gas is actively monitored at non-hazardous landfill immediately east of the Site.	Site will have basal and sidewall liner which will minimise the risk of gas entering the site from adjacent deposits, if present.	Low
Local human population and local environment.	Build up and emissions of gas from placed wastes within the Site.	Respiratory irritation, illness, and nuisance to local population. Risk of explosion and injury to staff and local population.	Gas generated on site and migrating off site.	Low	High	Medium	Waste types to be accepted comprise non-biodegradable soil and stones. Soils with the potential for high organic content (topsoils) will be placed within the top 50cm only.	Site will have basal and sidewall liner. Waste acceptance procedure will ensure only permitted wastes are accepted and deposited for recovery.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for Magnitude	Risk Management	Residual Risk
							Accidental placement of soils with organic materials are unlikely to generate significant quantities of gas which will migrate offsite.		

Appendix 3

Hydrogeological Risk Assessment

HYDROGEOLOGICAL RISK ASSESSMENT

SANDY LANE QUARRY

Report Reference: 3308/HRA
Final Version F1
August 2022

Report prepared for:

NRS Bromsgrove Aggregates Limited
NRS House -Site 7
Meriden Park
Cornets End Lane
MERIDEN
Warwickshire CV7 7LG

Barkers Chambers • Barker Street • Shrewsbury • United Kingdom • SY1 1SB
T: 01743 355770 • *F*: 01743 357771 • *E*: info@hafrenwater.com

GENERAL NOTES

Title of report: Hydrogeological Risk Assessment

Site: Sandy Lane Quarry

Report ref: 3308/HRA

Date: August 2022

Version	Date	Issued to
D1	August 2022	

Author: Dylan Ingman BSc MSc FGS

Reviewer: Heather Macleod BSc MSc FGS

https://hafrenw.sharepoint.com/sites/HafrenWater/Shared Documents/General/Projects/Sandy Lane Quarry (3084)/2022_Permit application/Reports/HRA/3308_HRA.docx

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1 INTRODUCTION

1.1 Report context

The site at Sandy Lane, Bromsgrove, Worcestershire (the 'site') comprises a former sand quarry owned by NRS Bromsgrove Aggregates Limited (NRS). The Sandy Lane complex comprises three main areas: in the centre is the completed Veolia Landfill, to the east former silt settlement lagoons and in the west a disused quarry void. This NRS site comprises the western quarry void only.

It is proposed to remove final sand reserves, provide buttress support to the eastern quarry face and restore the remainder of site using inert fill back to approximately pre-quarrying ground levels. A post-restoration agricultural landuse is proposed.

The proposed stabilisation the failing eastern quarry face (western sidewall of the Veolia landfill) will comprise the construction of a foundation buttress using selected fill. The importation of 975,000 m^3 of inert fill is required to complete the site restoration.

It is intended to apply for a permit for importation of inert fill to restore the site as a waste recovery operation under the Environmental Permitting (England and Wales) Regulations (EPR) (2016). No waste has been placed at the site historically.

This report sets out the Hydrogeological Risk Assessment (HRA) that has been prepared in support of the Environmental Permit Application for the proposed inert waste recovery. The HRA has been prepared with due regard to the hydrogeological risk assessment guidance (Environment Agency, 2020) and reporting guidance (Environment Agency, February 2022) provided by the Environment Agency.

1.2 Conceptual hydrogeological site model

The conceptual hydrogeological model for the proposed waste operation is described in Section 4 of the ESSD report and illustrated on *Drawing 3308/HRA/01*. The proposed permit boundary covers the site and access road and totals approximately 5.5 hectares (ha). Sandy Lane parallels the southern boundary of the Site and land to the north comprises grazing pasture. A footpath lies between Madeley Road and the western boundary of the site and between the northern boundary and the adjacent pasture.

Geological and hydrogeological setting

Sandy Lane Quarry lies within the Wildmoor Sandstone Member, the outcrop of which is bounded by north-south aligned faults to the east and west. The Formation comprises a red brown silty, fine to medium-grained weak sandstone with subordinate and discontinuous

siltstone and mudstone layers. It is reported to be up to 284 m thick in the Worcester Basin and in the Wildmoor No 2 borehole the base is reported to be at a depth of approximately 143 m. The BGS hold records for two boreholes within the adjacent Veolia site (SO97NE457 and SO97NE456) which prove sandstone to a depth of 50m bgl. The strata dip at around 8° to the southwest (BGS, 2009).

Superficial deposits are relatively sparse in the area and none are present in the immediate vicinity of the site.

Groundwater monitoring has been undertaken at boreholes in the adjacent Veolia site. During February 2021, boreholes adjacent to the eastern site boundary indicate groundwater is at approximately 143 m AOD and 146 m AOD (approximately 4 to 7m below the base of final extraction at Sandy Lane Quarry). The monitoring indicated groundwater flow to be east-southeastwards, with an estimated gradient of 0.02 to 0.03. Monitoring undertaken in 2001 indicates groundwater flow towards the southeast, however it is not clear what has caused this change in flow direction.

Mineral extraction of the remaining sand reserves will remain above the water table.

Engineering/waste recovery construction

A natural geological barrier does not exist at the site and it has been decided that an artificial geological barrier will be placed against the base and sides of the quarry void due to the sensitive site location. This will be undertaken using suitable imported inert material. This barrier will have a minimum thickness of 1 m placed to achieve a maximum permeability of 5×10^{-9} m/s, or equivalent (See section 2.5).

A cap is not required at the site, in accordance with the Landfill Directive.

Source

The waste recovery area will receive inert waste which complies with the Landfill Directive description for Inert Waste. This will be ensured by appropriately trained staff and by the application of strict Waste Acceptance Criteria and Procedures (WAC) (provided elsewhere in the application). All incoming waste will be from known sources. Any waste that has not been identified as acceptable without testing, will be subject to Inert WAC testing in addition to waste classification analyses.

Approximately 975,000 m^3 of inert fill will be required to achieve the agreed restoration contours.

Pathways

Strata from the Sherwood Sandstone will remain in place below the geological barrier and waste. There is, therefore, a potential pathway through the base of the site via the geological barrier.

Receptors

Groundwater exists below the base of the site with the Sherwood Sandstone aquifer, which forms the primary groundwater receptor.

The site lies within the catchment of a Severn Trent Water public supply borehole, this is considered a secondary groundwater receptor. Other licensed abstractions within the area are either up hydraulic gradient or further away from the site than the public supply borehole.

Groundwater flow is to the east and may provide some baseflow to Battlefield Brook which flows southwestwards, east of the site. Battlefield Brook forms a secondary receptor.

Identified receptors and pathways are summarised in *Table 3308/HRA/T1* below.

3308/HRA/T1: Summary of identified receptors and pathways	
Hazard	The proposed waste at the site will be inert in nature (see Section 2.2 of the ESSD report) therefore it is considered that the site poses minimal potential hazard to nearby surface and groundwater. An estimated 975,000 m^3 of inert material will be imported.
Source	All waste to be deposited will adhere to Waste Acceptance Criteria and Procedures which shall ensure the waste is correctly characterised and inert in accordance with Environment Agency guidance. No Hazardous substances are expected to be present and Non-hazardous pollutants, if present within the leachate, will be of low concentration such that pollution of nearby groundwater and surface water will not occur.
Potential primary pathway	Primary pathways may exist via the artificial geological barrier vertically into the Sherwood Sandstone aquifer.
Potential secondary pathway	A secondary pathway exists via groundwater flow through the Sherwood Sandstone.
Potential primary receptor	Sherwood Sandstone principal aquifer
Potential secondary receptor	Groundwater – Severn Trent public water supply Surface Water – Battlefield Brook
Compliance point	For Hazardous substances –Groundwater on the east site boundary For Non-hazardous pollutants – as above

2 HYDROGEOLOGICAL RISK ASSESSMENT

2.1 Nature of the Hydrogeological Risk Assessment

Environment Agency guidance proposes a tiered approach to risk assessment such that the degree of effort and complexity reflects the potential risk posed by a particular site or situation, the sensitivity of the site setting, and the degree of uncertainty and likelihood of the risk being realised. To meet the requirements a robust conceptual model for the site has been set out and a risk screen undertaken. The conceptual model is set out in the ESSD report (3308/ESSD Aug 22) and the risk screening is summarised in Section 2.2 and 2.3 below. A risk screening exercise is used to determine whether the proposed waste recovery operation represents, or potentially represents, a risk to groundwater or surface water resources.

2.2 Policy

Compliance with Environmental Permitting (England and Wales) Regulations (2016)

Based upon the inert waste types to be accepted at the site, the site should not produce leachate (defined here as water coming into contact with the waste) that could result in the discharge of Hazardous substances or Non-hazardous pollutants. Hence the site falls outside the scope of the Environmental Permitting (England and Wales) Regulations (2016), Schedule 22 Groundwater Activities.

Environment Agency Landfill location Policy

The proposed waste recovery operation is located within a bedrock classified as a Principal Aquifer. The sandstone aquifer is in hydraulic continuity with the nearby Battlefield Brook. The site is located within Source Protection Zone 3 (SPZ 3) for a Severn Trent public water supply located approximately 1 km southeast of the site. The Environment Agency's position statement indicates that non-landfill waste activities can be located within SPZ3 where the risk can be appropriately controlled by an environmental permit or a relevant waste exemption.

The proposed waste recovery at Sandy Lane Quarry will receive only Landfill Directive compliant inert wastes, hence long-term site management will not be required to prevent groundwater pollution. The ESSD report, together with this HRA, constitutes a site-specific risk assessment.

It is therefore concluded that the site complies with the Environment Agency landfill location policy.

2.3 Risk screening

The proposed waste acceptance criteria (Inert WAC) have been compared with appropriate environmental assessment limits (EALs) to identify any contaminants in the waste that, if leached, could exceed relevant standards at the site boundary. Hazardous substances were compared with Minimum Reporting Values (MRVs) or, where these were not available, with limits of qualification (LoQ) defined by UKTAG.

The screening assessment entailed applying a dilution factor for the site to Inert WAC concentrations to identify any substances where dilution within the aquifer would not be sufficient to prevent the EALs from being breached in the groundwater beneath the site.

The infiltration rate to imported fill is estimated as 50.29 m^3/day based on the rainfall values provided in Section 3.4.1 of the ESSD and the site dimensions. The rate of groundwater flow beneath the site has been estimated as 12,372 m^3/day based on approximate dimensions of the site, a permeability for the sandstone of 12.1 m/day and a hydraulic gradient of 0.02.

This equates to a dilution factor of 246. Based on this dilution factor, dilution alone would be insufficient to dilute a constant source of leachate with maximum Inert WAC concentrations for certain substances. Further quantitative risk assessment modelling for mercury, lead, benzene and benzo-a-pyrene was, therefore, undertaken as described in Section 2.5.

Further details of the quantitative risk screen are provided in *Appendix 3308/HRA/A1*.

2.4 Proposed assessment scenarios

Lifecycle phases

Environment Agency guidance states that a Hydrogeological Risk Assessment must be carried out for the whole lifecycle of the waste operation, ie from the start of the operational phase until the point at which the site is no longer capable of posing an unacceptable environmental risk.

The restored site has been modelled as this represents the largest volume of waste present within the site. Operational phases have not been modelled as there will be no active management of leachate or groundwater during the wate recovery operation.

2.6 Failure scenarios and accidents

Failure scenarios

Due to the inert nature of the proposed waste stream and the location of the site above the watertable, there are no engineering management structures are required to prevent the ingress of groundwater or the egress of leachate. Failure of such systems is, therefore, not possible and failure scenarios will not be considered.

Accidents

Accidents are considered to be unintentional incidents that could reasonably occur, which are unforeseeable at their time of occurrence. An assessment of the potential impacts of accidents, together with the likelihood of their occurrence and magnitude of the consequences (in relation to compliance with the Environmental Permitting (England and Wales) Regulations, 2016 (EPR, 2016)) is presented below.

Accidents at the site could include the acceptance of contaminated material. Due to the proposed Waste Acceptance Criteria and Procedures and absence of any historical waste on-site, it is considered highly unlikely that 'rogue loads' will be accidentally accepted at the site. However, a rogue load assessment has been undertaken and is described in Section 2.6.

2.7 Risk Assessment Modelling

To support the application for bespoke environmental permit, the completed Site has been modelled using the RAM spreadsheet modelling software. The software was used to assess natural attenuation capacity at the Site and surrounding area and model the potential for contaminants at the Site to impact on water quality of sensitive controlled water receptors.

The contaminant species identified by the Risk Screening as being at risk of breaching their respective EAL's have been modelled, and include mercury, lead, benzene and benzo-a-pyrene.

Initial runs of the model indicated that an artificial geological barrier will be required to provide sufficient attenuation to ensure compliance with the EAL's can be achieved. The artificial geological barrier will be constructed across the base and sides of the waste recovery area to separate the waste from the surrounding sandstone strata. Sensitivity analysis of the barrier indicates that the barrier will need to be 1m thick with a hydraulic conductivity of $5x10^{-9}$ m/s, or 2m thick with a hydraulic conductivity of $1 x10^{-8}$ m/s, or equivalent.

Model parameterisation

The parameters used in the RAM assessment are described together with justification for their use within the RAM model and in *Table 3308/HRA/T2*. A printout of the RAM model is provided as *Appendix 3308/HRA/A2* and an electronic version will be e-mailed.

Two pathways have been modelled:

a) From the source, through the geological barrier vertically and into the underlying sandstone aquifer.

b) From the source, through the geological barrier and transport through the sandstone aquifer to the site boundary (although results for this pathway are not reported as no Non-hazardous substances were modelled)

The RAM model simulates the resultant concentrations in groundwater surrounding the site based on a declining source term. It also calculates what the maximum leachable concentrations could be before failure of the EAL's at the modelled receptors (similar to the remedial targets calculated in the Environment Agency's Annex J5 spreadsheet) occurs.

Parameter values were determined from information directly measured on-site or, in the absence of site data, other recognised sources. The results of the assessment are discussed below.

3308/HRA/T2: Model input parameters		
Parameter	**Value/distribution**	**Justification**
SOURCE TERM		
Waste volume (m^3)	975000	
GENERAL CONTAMINANT INFORMATION		
Free water diffusion coefficient (m^2/s): Mercury Lead Benzene Benzo-a-pyrene	 2.00×10^{-9} 1.00×10^{-9} $6.64x\ 10^{-10}$ 6.90×10^{-10}	Environment Agency, Soil Guideline Values US EPA SR7 2008
HYDROGEOLOGICAL UNITS		
Thickness (m): Artificial geological barrier Unsaturated zone Saturated Sandstone	 1 3.5 10	 Assumed likely achievable value Minimum based on borehole SAN821 Conservative estimate base on likely mixing depth.

3308/HRA/T2: Model input parameters		
Parameter	**Value/distribution**	**Justification**
Hydraulic conductivity (m/s):		
Artificial geological barrier	5 x 10^{-9} m/s	Assumed likely achievable value
Sandstone	1.4 x 10^{-4} m/s (12.1 m/d)	Median value BGS Aquifer Properties manual[1]
Hydraulic gradient:		
Artificial geological barrier	1	Assumed vertical
Saturated aquifer	0.02	Average gradient from boreholes in adjacent Veolia site.
Porosity:		
Artificial geological barrier	0.4	
Sandstone	0.27	
Tortuosity	5	Assumed generic value for all hydrogeological layers
Horizontal travel distance in sandstone (m)	103.5	Half the length of the site perpendicular to groundwater flow direction.
ATTENUATION PARAMETERS		
Dispersivity	Unit thickness/10	Standard assumption
Mixing depth in Sandstone (m)	10	Assumed
Bulk density (kg/m^3):		
Artificial clay barrier	1600	Estimate
Sandstone	2500	Key GS Stability Assessment Feb 2021
Fraction of organic carbon:		
Artificial geological barrier	0.01	
Sandstone	0.001	
<u>Mercury</u>		
Partition coefficient (k_d) (L/kg)		
Artificial geological barrier	450	Consim
Sandstone	450	
<u>Lead</u>		
Partition coefficient (k_d) (L/kg)		
Artificial geological barrier	220	
Sandstone	220	
<u>Benzene</u>		
Partition coefficient (k_d) (L/kg)		
Artificial geological barrier	0.066	
Sandstone	0.66	
Half life (days)	198	Suarez & Rifai (1999), Median value for mixed redox processes.

3308/HRA/T2: Model input parameters		
Parameter	**Value/distribution**	**Justification**
Benzo-a-pyrene		
Partition coefficient (k_d) (L/kg)		
Artificial geological barrier	1170	
Sandstone	11700	
Half life (days)	830	Wild et al (1992)
WATER BALANCE		
Precipitation (mm/yr)	800.3	Rain gauge SO 9509 7629, LTA.
Effective Precipitation (mm/yr)	359.1	Rainfall minus potential evapotranspiration from Area 30, MAFF Technical Bulletin 34

2.8 Whole site assessment

Modelling Approach

Modelling of the whole restored site has been undertaken as this represents the largest volume of waste present within the site. Initial modelling was undertaken without a geological barrier present. The results from the initial model indicated that a geological barrier would be required to prevent exceedance of the relevant EAL's.

Subsequent modelling comprised sensitivity analysis to determine the range of thickness and hydraulic conductivity values that would be required to provide sufficient attenuation to prevent exceedance of the EAL's.

Environmental Assessment Levels

Environmental Assessment Levels (EALs) are used to determine the local sensitivity of the groundwater and are a measure against which the results of models can be compared. EALs are determined on the basis of available water quality standards and concentrations.

All of the substances to be modelled (following the risk screening), are Hazardous Substances. The EPR (2016) requires there to be no discernible discharge of Hazardous substances to groundwater. Therefore, the appropriate EAL would be the concentration at which they become 'discernible'. The EAL's have been adopted as the Minimum Reporting Value (MRV), where these were not available for a contaminant the Limit of Quantification (LoQ) was adopted.

The adopted EAL's are presented in *Table 3308/HRA/T3*.

3308/HRA/T3: Summary of adopted EALs	
Determinand	**EAL (µg/l)**
Mercury	0.01
Lead	0.2*
Benzene	1
Benzo-a-pyrene	$5x10^{-5}$ *
* LoQ adopted as EAL	

Results

Sensitivity analysis indicates that in order to prevent exceedance of the EAL's the geological barrier will need to be 1m thick with a hydraulic conductivity of 5 $x10^{-9}$ m/s or, 2 m thick with a hydraulic conductivity of 1 x 10^{-8} m/s, or equivalent. With this in place the following peak concentrations are recorded at the compliance point.

3308/HRA/T4: Peak concentrations	
Determinand	**Peak concentration at the appropriate receptor (time to peak in years)**
Hazardous: Mercury Lead Benzene Benzo-a-pyrene	 $2x10^{-7}$ mg/l / $2x10^{-4}$µg/l (1200 years)* $1.6x10^{-4}$ mg/l / 0.16 µg/l (1200 years)* $4.1x10^{-4}$ mg/l / 0.41 µg/l (5 years) No concentration detectable
*Model run to 1200 years, concentrations appear to be peaking. Actual peaks will be broader, shallower and arrive earlier as waste will be progressively placed.	

2.9 Rogue load assessment

Modelling Approach

The waste acceptance procedures to be applied at the site make the deposition of rogue loads unlikely and the potential risk to groundwater minimal. However, due to the sensitivity of the site setting, risk assessment modelling of acceptance of an accidental rogue load has been undertaken.

It is not possible to model a number of rogue loads distributed throughout the waste body. Therefore, for the purposes of the rough load assessment the initial contaminant concentrations have been assumed as a weighted average with 90% of the waste at half the Inert WAC concentrations (based on the likely nature of the waste to be accepted) and the

remaining 10%, representing rogue loads, being modelled at three times Inert WAC concentrations.

The rogue load analysis forms an assessment of a plausible failure scenario and as such is not expected to occur. The scenario modelled is very conservative, in that 1 in 10 loads received by the site exceed the Inert WAC levels. A printout of the results has been included in Appendix 3308/HRA/A3.

Results of rogue load risk assessment

The rogue load assessment did not result in a breach of the EAL by any of the determinands modelled. The results of the modelling indicate that unlikely event that rogue loads are deposited at the site, 10% non-conforming waste with concentrations up to 3 times the inert WAC can be accepted at the site without breach of the EALs at the compliance point.

2.10 Review of technical precautions

Due to the inert nature of the waste it is considered that the proposed essential and technical precautions detailed below are appropriate and sufficient to prevent any unacceptable discharge from the site:

- Strict control of waste types sourced and accepted
- Strict adherence to Waste Acceptance Criteria and Procedures, including Inert WAC analyses
- Removal of standing water in areas of waste recovery prior to commencement of waste placement
- Provision of an artificial geological barrier as determined by the HRA
- Progressive restoration to a suitable profile to encourage surface water run-off and minimise water ingress
- Provision of ditches or berms on the western boundary to minimise surface water ingress to the operational waste recovery area
- Groundwater monitoring

It is considered that leachate monitoring and management is not required due to the inert nature of the waste.

2.11 Emissions to groundwater

One of the main purposes of the HRA is to establish whether the predicted discharge from the waste recovery area complies with the requirements of the Environmental Permitting (England and Wales) Regulations (2016) Schedule 22 Groundwater activities.

Hazardous substances

The HRA must demonstrate that the proposed technical precautions will prevent Hazardous substances from entering groundwater. Consequently it must consider whether there is likely to be a discernible discharge of Hazardous substances to groundwater. The compliance point is, therefore, the watertable prior to any dilution occurring.

Due to the provision of an artificial geological barrier, there is considered to be no direct discharge to groundwater. Potential exists for an indirect discharge to the underlying sandstone. However, given the strictly inert nature of the waste to be imported, together with the provision of a geological barrier the results of the HRA indicate that during normal operation and through to long-term post-closure there will be no discernible discharge of Hazardous substances to groundwater.

Non-hazardous pollutants

The HRA must demonstrate that technical precautions will limit the introduction of Non-hazardous pollutants into groundwater so as to avoid pollution. Consequently, it must consider whether predicted concentrations of Non-hazardous pollutants are likely to exceed relevant standards and other environmental quality criteria, or cause an unacceptable deterioration in groundwater quality following dilution.

A pathway exists for Non-hazardous pollutants. However, given the inert nature of the waste and the provision of a geological barrier, it is concluded that under normal operation and through to long-term post-closure concentrations of Non-hazardous pollutants would be sufficiently low as to avoid pollution of the groundwater.

2.12 Surface water management

The proposed inert waste recovery area is not located in an area that is liable to flood. However, given that the void represents a topographic low, run-off will need to be managed.

During the operational phase, run-off will be directed away from the areas of active waste recovery.

Post-operation, the restoration profile of the inert waste recovery area will be domed and run-off collect in perimeter drains and be directed to the northwestern corner of the site where it will collect in a pool adjacent to a residual sandstone face. Infiltration to the face will occur together with loss through evaporation. There will be no need to actively manage surface water post-closure.

2.13 Emissions to surface water

Given the geometry of the restoration profile, the inert nature of the waste and the other technical precautions in place, it is concluded that during normal operation and through to long-term post-closure, concentrations of Hazardous substances will not be discernible and Non-hazardous pollutants will be sufficiently low as to avoid pollution of surface water.

2.14 Hydrogeological completion criteria

Hydrogeological completion criteria refer to the conditions that must be met before an Environmental Permit can be surrendered, ie Permit Completion attained. Completion relating to hydrogeological risk will have been achieved when there is no longer any unacceptable risk of pollution from the waste recovery area, ie the site complies with the Environmental Permitting (England and Wales) Regulations (2016) Section 22 Groundwater Activities without any active leachate management. It is suggested that assessment of completion should be with reference to the recommended Environmental Assessment Levels (EALs).

As the site is inert and unacceptable discharge is unlikely, it is considered that hydrogeological completion criteria will not be the controlling factor in the ultimate surrender of the Environmental Permit. Guidance issued by the Environment Agency[1] states that for inert waste permitted under the Landfill Directive "you should be able to demonstrate, through waste records, that the waste accepted is genuinely inert", and this could form the basis for Permit Surrender, together with appropriate construction quality assurance (CQA) reports and review of relevant environmental monitoring.

1 Environment Agency, 13/12/2012. Additional guidance for Landfill (EPR 5.0) and other permanent deposits of waste: how to surrender your permit

3 REQUISITE SURVEILLANCE

3.1 Risk-based monitoring scheme

Under the Environmental Permitting (England and Wales) Regulations (2016), there is a requirement for 'requisite surveillance' in the form of leachate, groundwater and surface water monitoring.

Environmental monitoring is a crucial element of the risk assessment process as it:

- Allows for validation of the risk assessment
- Can confirm whether risk management options are meeting their aims
- Provides a warning mechanism if adverse impacts are found

Leachate monitoring

There is no requirement for collection and management of leachate, hence leachate monitoring is not proposed.

Groundwater Monitoring

Groundwater monitoring boreholes will be drilled at the site and will target the groundwater within the Wildmoor Sandstone. A minimum of three boreholes are proposed to be constructed down groundwater gradient of the waste recovery area, and one upgradient to supplement the Veolia boreholes on the site boundary. The locations of the proposed boreholes are shown on *Drawing 3308/HRA/02* and these are to be agreed subject to access constraints.

The monitoring suite proposed for these locations is shown in *Table 3048/HRA/T5*.

3308/HRA/T5: Proposed monitoring suite for groundwater samples	
Frequency	**Suite**
Quarterly	Level, pH, conductivity, ammoniacal nitrogen, chloride, Chemical Oxygen Demand, Nitrate, Sulphate, Mercury, Nickle, Lead, benzene, arsenic.
Annually	As quarterly suite plus total alkalinity, sodium, magnesium, potassium, copper, zinc, chromium, iron, manganese, cadmium, BTEX total petroleum hydrocarbons, polyaromatic hydrocarbons

Surface water monitoring

No run-off will be discharge from the site and there are no watercourses or waterbodies in close proximity to the site. Therefore no surface water monitoring is proposed.

4 CONCLUSIONS

4.1 Compliance with the Landfill Regulations, 2002

It is considered that the artificial geological barrier to be constructed on the sides to provide a maximum permeability of 1 m at 5 x 10^{-9} m/s, or equivalent, is such that the Landfill Regulations requirement for a geological barrier will be met. There is no requirement for an artificial sealing liner or leachate management system due to the inert nature of the waste. **It is therefore considered that the waste recovery site will be compliant with the requirements of the Landfill Regulations 2002**.

4.2 Compliance with the Environmental Permitting (England and Wales) Regulations (2016)

The risk assessment has demonstrated that under normal operational and post-operational phases, Hazardous substances will not be present in groundwater beneath the site in concentrations discernible above background. **It is therefore considered that the site will be compliant with respect to the Environmental Permitting (England and Wales) Regulations (2016).**

5 REFERENCES

British Geological Survey (BGS), 2009. Bromsgrove Aquifer Groundwater Modelling Study: Results from Task 1.1 3D Visualisation and Geological Framework of the Bromsgrove Aquifer. Commissioned Report CR/09/023

Environment Agency, October 2020. Landfill developments: groundwater risk assessment for leachate. https://www.gov.uk/guidance/landfill-developments-groundwater-risk-assessment-for-leachate.

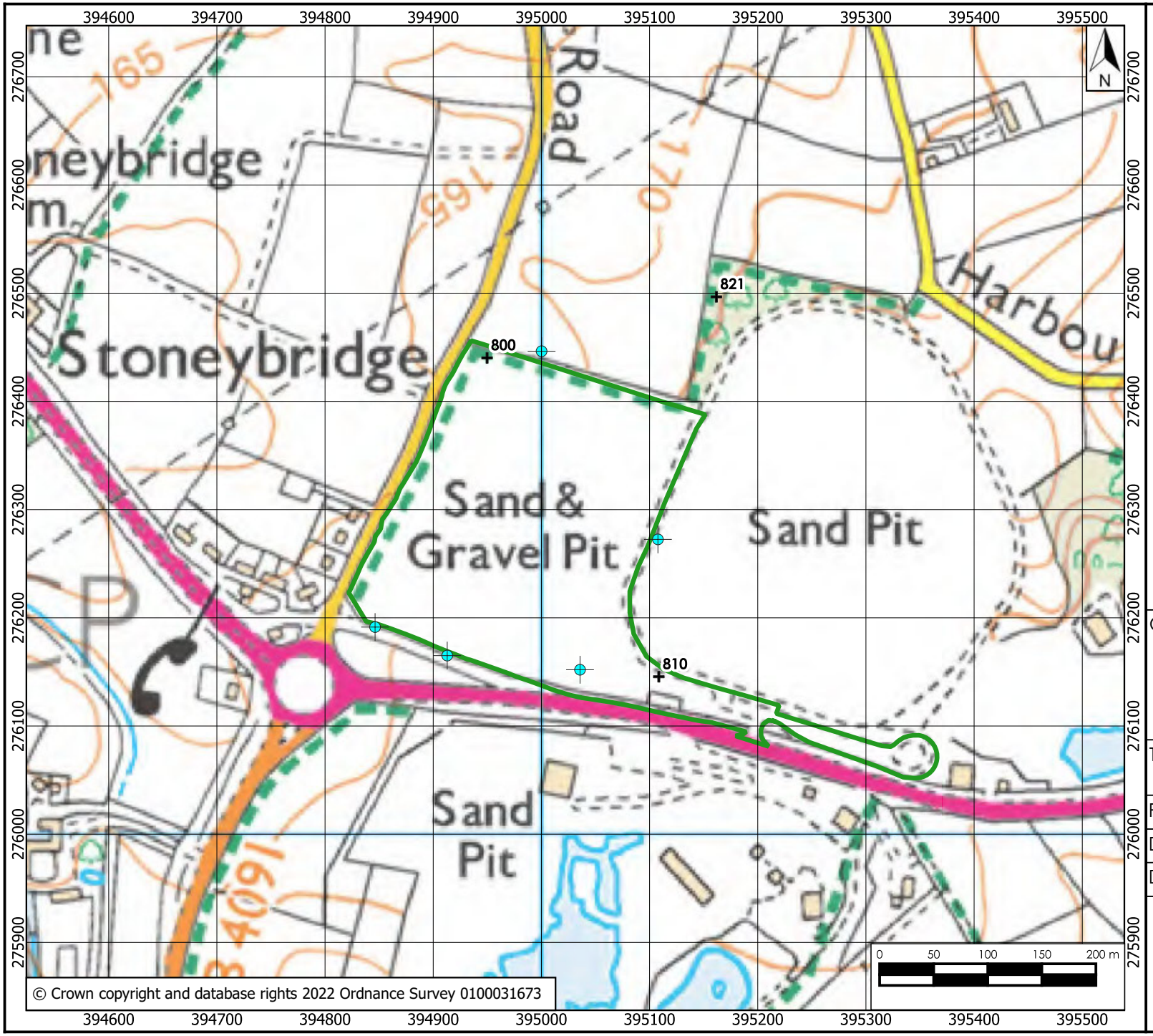
Environment Agency, February 2022 What to include in your hydrogeological risk assessment. https://www.gov.uk/guidance/landfill-operators-environmental-permits/what-to-include-in-your-hydrogeological-risk-assessment#:~:text=Your%20hydrogeological%20risk%20assessment%20must%20normally%20include%3A,the%20geology%20and%20hydraulic%20gradient

Hafren Water. Conceptual Model, Environmental Setting and Site Design report. Sandy Lane Quarry. Report reference: 3308/ESSD.

ESI, 2001. Benchmarking RAM: ESI's Groundwater Risk Assessment Tool. Report Reference 5303R1

ESI, 2008. RAM3 User Guidance

DRAWINGS



Legend

- Site Boundary
- Proposed Monitoring Borehole
- Veolia Monitoring Borehole

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Proposed Monitoring Borehole Locations
Project	Sandy Lane Quarry
Drawing	3308/HRA/02
Versio	1
Date	Aug 22
Scale	1:5,000

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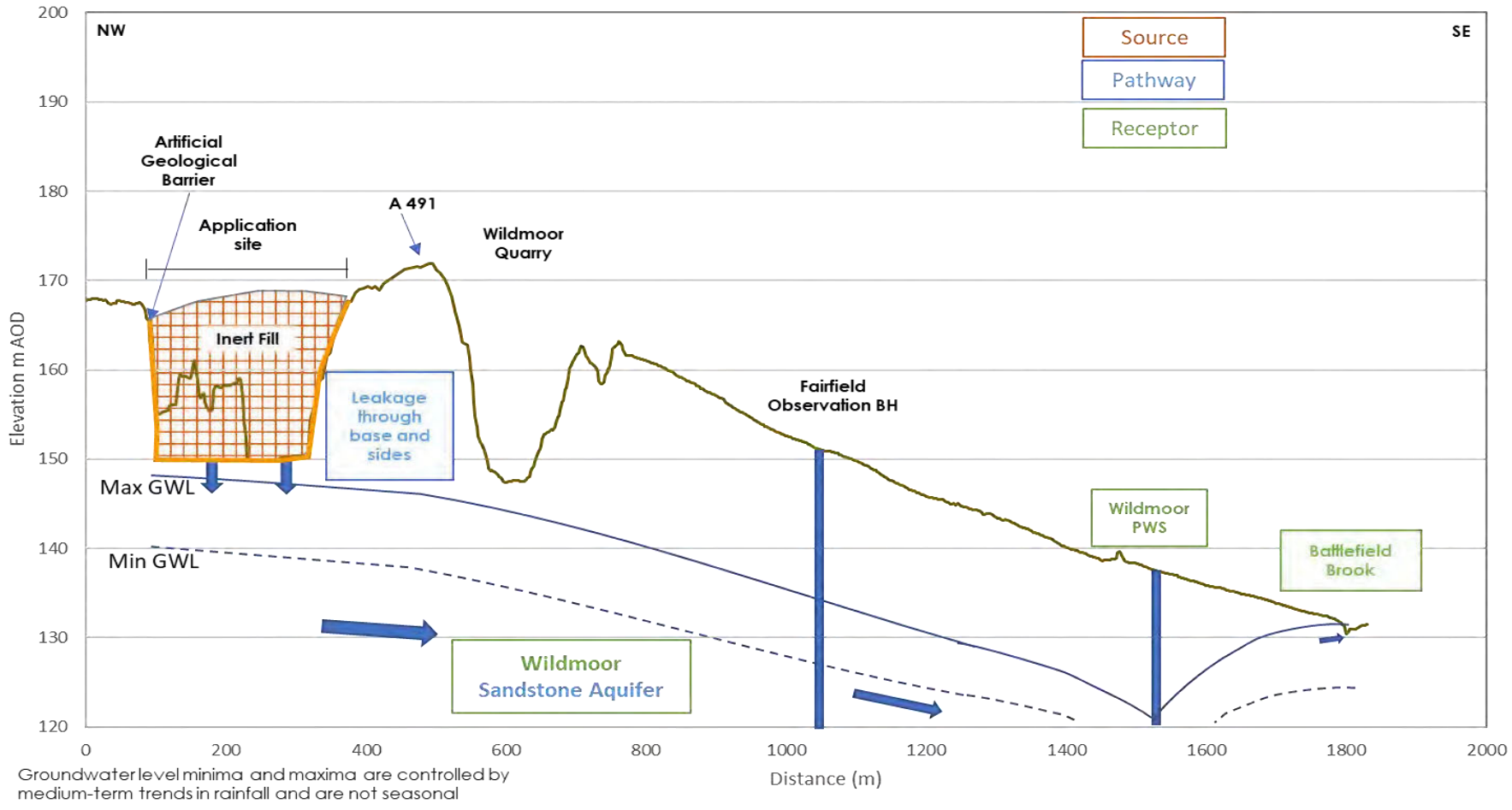
environmental water management
Barkers Chambers • Barker Street • Shrewsbury • Shropshire • SY1 1SB
www.hafrenwater.com • Tel. 01743 355 770



hafrenwater
environmental water management
Barkers Chambers • Barker Street • Shrewsbury • United Kingdom • SY1 1SB
E: info@hafrenwater.com • T: 01743 355 770

Client	NRS Bromsgrove Aggregates		
Title	Conceptual model		
Project	Sandy Lane Quarry		
Drawing	3308/HRA/01	Version	1
Date	Aug-22	Scale	

APPENDIX 3308/HRA/A1

Tier 1 Risk Screening

hafrenwater
environmental water management

Calc sheet by:	DI	Yellow	Data entry
Version number:	1	Green	Formulae
Date:	07/07/2021	Blue	Select from list

Generic inert Waste Acceptance Criteria (WAC) limits have been compared to appropriate screening values.

A screening exercise has been undertaken using a calculated dilution factor.

Hazardous Substances have been compared against the Minimum Reporting Values (MRV)

Non-Hazardous Substances have been compared againts DWS values

Type of Dilution Aquifer

Screening Values (µg/l)

Parameter	Inert WAC	MRV	DWS	EQS	User Defined
Arsenic (As)+	500	5	10	50	
Cadmium (Cd)	40	0.1	5	0.08	
Copper (Cu)	2000		2000	1	
Total Chromium (Cr)	500	37.5	50	4.7	
Chromium VI+		1		3.4	
Nickel (Ni)	400		20	4	
Mercury (Hg)	10	0.01	1	0.07	
Lead (Pb)+	500	0.2	10		
Selenium (Se)	100		10		
Chloride (Cl^-)	8.0E+05		250000		
Sulphate (SO_4^{2-})	1.0E+06		250000		
Benzene	6000	1	1	10	
Benzo-a-pyrene+	1.0E+05	5.0E-05	1.0E-02	1.7E-04	

Hazardous substance

+ *MRV assumed as Limit of Quantification (LoQ)*

Calculation of Dilution Factor

Site Parameters			Data Source
Rainfall infiltration rate	359.0	mm/yr	MAFF data and CEH-GEAR
Area of landfill	51128	m^2	measured
Total infiltration	50.29	m^3/day	

Aquifer Dilution			
Hydraulic Conductivity (k)	12.1000	m/day	Allen et al. 1997
Hydraulic Gradient (i)	0.0200		Estimated from water strike data
Area	51128	m^2	Measured site area
Flow Rate (Q)	12372.976	m^3/day	

Waterbody Dilution			
Waterbody Area		m^2	
Waterbody Depth		m	
Waterbody Volume	NA	m^3	

Watercourse Dilution			
Flow Rate		m^3/sec	
Volume	NA	m^3/day	

Dilution Factor 246.04

Screening Assessment

Parameter	WAC after dilution	Exceeds selected screening value?	Max allowable concentration		
Arsenic (As)[+]	2	No	NA	µg/l	
Cadmium (Cd)	0.16	No	NA	µg/l	
Copper (Cu)	8	No	NA	µg/l	
Total Chromium (Cr)	2.0	No	NA	µg/l	
Chromium VI[+]	No Value	No Value	NA	µg/l	
Nickel (Ni)	2	No	NA	µg/l	
Mercury (Hg)	0.04	Yes	2.46	µg/l	modelled in RAM
Lead (Pb)[+]	2.0	Yes	49.2	µg/l	modelled in RAM
Selenium (Se)	0.4	No	NA	µg/l	
Chloride (Cl^-)	3251	No	NA	µg/l	
Sulphate (SO_4^{2-})	4064	No	NA	µg/l	
Benzene	24	Yes	246.04	µg/l	modelled in RAM
Benzo-a-pyrene[+]	406	Yes	1.2E-02	µg/l	modelled in RAM

Hazardous substance

[+] *MRV assumed as Limit of Quantification (LoQ)*

Notes

Non-Hazardous substances have been compared against DWS values as groundwater is the primary receptor.
The EQS value for Cadmium is determined by the water hardness. As the hardness is unknown, the most stringent value has been adopted.
The EQS value for Copper is based on the bioavailable fraction.

Common Assumptions & References

Benzene concentrations are assumed as indicative of BTEX concentrations.
Benzo(a)pyrene concentrations are assumed as indicative of PAH concentrations.
Hazardous substances as defined by List I Substances under Groundwater Directive 2006/118/EC
Assumes 'leachate' density equals that of water and hence 1 mg/kg is equivalent to 1 mg/l

Council Decision Annex 2003/33/EC

The Water Supply (Water Quality) Regulations 2016

UKTAG Technical Report on Groundwater Hazardous Substances 11b(iii) v12, Sep 2016

APPENDIX 3308/HRA/A2

Whole Site RAM model

Source Type

☐ Soil Source ☐ Groundwater Source

Level Number

◉ Advanced

Parameter Values

◉ Deterministic ○ Probabilistic

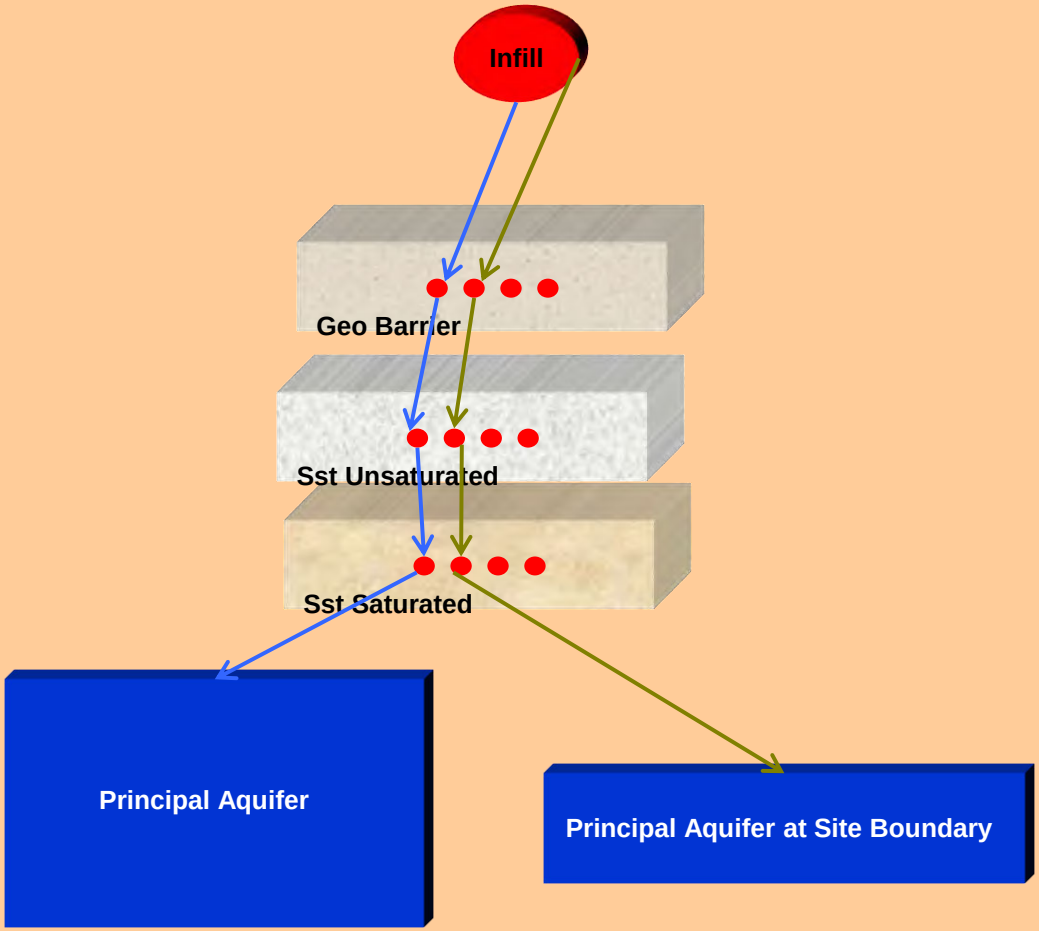
Created: 14/07/2022 11:35:25

by: Heather MacLeod

Version: 3.06.00x StdBmb

Site: Sandy Lane RAM1

Numerical value
Suggested formula
Probabilistic parameters
Data specified elsewhere
Suggested formula edited



SOURCE CONCENTRATIONS: Infill

Source Data Options

- (●) Pore water concentrations
- ( ) Leaching test
- ( ) Soil contaminant concentrations

Source Type

- ( ) Constant source
- (●) Declining source

Source Geometry

Infill_Source_length	207	**m**
Infill_Source_width	246	**m**
Infill_Source_area	51128	**m2**
Infill_Source_thickness		**m**
Infill_Source_volume	975000	**m3**

General Source Properties

Infill_Source_field_capacity	**[-]**	0.2

Source Contaminant Information

Source determinand names		Hg	Pb	Benzene	BaP
Infill_Pore_water_concentration	**mg/L**	0.01	0.5	6	100
Infill_Initial_inventory	**kg**	1.95	97.5	1170	19500
Infill_Input_concentration	**mg/L**	0.01	0.5	6	100

CONTAMINANT INFORMATION

		Species1	Species2	Species3	Species4
Source determinand names	4	Hg	Pb	Benzene	BaP

Receptor Target Concentrations

	Name	Values in mg/L			
Quality Standard 1	MRV	0.00001	0.0002	1.00E-03	5.00E-08
Quality Standard 2					
Quality Standard 3					
Quality Standard 4					

Generic Contaminant Properties

Contaminants_Organic_Carbon_Water_Partition_Coefficient_Koc	**L/kg**			66	1.17E+06
Contaminants_Free_Water_Diffusion_Coefficient	**m2/s**	2.00E-09	1.00E-09	6.64E-10	6.90E-10

HYDROGEOLOGICAL UNITS

Hydrogeological Units		Sst Unsaturated	Sst Saturated	Geo Barrier
Hydrogeology_Unit_Thickness	m	3.5	10	1
Hydrogeology_Log_Hydraulic_Conductivity	log(m/s)			
Hydrogeology_Hydraulic_Conductivity	m/s	1.40E-04	1.40E-04	5.00E-09
Hydrogeology_Head	m			
Hydrogeology_Hydraulic_Gradient	[-]	1	0.02	1
Hydrogeology_Porosity	[-]	0.27	0.27	0.4
Hydrogeology_Velocity	m/s	0.000518519	1.03704E-05	1.25E-08
Hydrogeology_Tortuosity	[-]	5	5	5

ATTENUATION PARAMETERS

Hydrogeological Units		Sst Unsaturated	Sst Saturated	Geo Barrier
General properties				
Attenuation_Dry_bulk_density	kg/m3	2200	2200	1600
Attenuation_Fraction_organic_carbon	[-]	0.001	0.001	0.01
Contaminant specific parameters				
Hg				
Attenuation_Partition_Coefficient_Kd_Species_1	L/kg	450	450	450
Attenuation_Retardation_Species_1	[-]	3667.666667	3667.666667	1801
Attenuation_Half_Life_Species_1	days	No Decay	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_1	1/s	0	0	0
Pb				
Attenuation_Partition_Coefficient_Kd_Species_2	L/kg	220	220	220
Attenuation_Retardation_Species_2	[-]	1793.592593	1793.592593	881
Attenuation_Half_Life_Species_2	days	No Decay	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_2	1/s	0	0	0
Benzene				
Attenuation_Partition_Coefficient_Kd_Species_3	L/kg	0.066	0.066	0.66
Attenuation_Retardation_Species_3	[-]	1.537777778	1.537777778	3.64
Attenuation_Half_Life_Species_3	days	198	198	198
Attenuation_Decay_Coefficient_Species_3	1/s	4.05179E-08	4.05179E-08	4.05E-08
BaP				
Attenuation_Partition_Coefficient_Kd_Species_4	L/kg	1170	1170	11700
Attenuation_Retardation_Species_4	[-]	9534.333333	9534.333333	46801
Attenuation_Half_Life_Species_4	days	830	830	830
Attenuation_Decay_Coefficient_Species_4	1/s	9.66571E-09	9.66571E-09	9.67E-09

WATER BALANCE

User defined

Enter your own calculations for the water balance
Carry fluxes and velocities over onto the Pathway sheet

Infiltration through the soil zone source

Source Name: Infill

Effective_Rainfall	359.1	**mm/year**
Infiltration_Factor	1	**[-]**
Infiltration_Rate	359.1	**mm/year**
Infiltration_Area	51128	**m2**
Q_Infiltration	0.000582	**m3/s**

	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (m	65.2	53.2	46.5	57.8	69.7	64.9	76.2	70.4	54.8	91.2	79.3	71.1
Potential transpiration (mm)	1	8	30	55	80	93	93	72	43	19	4	0
Effective rainfall (mm)	64.2	45.2	16.5	2.8					11.8	72.2	75.3	71.1
											Total ER	359.1

PATHWAY SUMMARY

Path 1	Section 1		Section 2		Section 3		Section 4		Section 5	
Path 1 Type	Source		Unit		Unit		Unit		Receptor	
Path 1 Name	**Infill**		**Geo Barrier: Node 1**		**Sst Unsaturated: Node 1**		**Sst Saturated: Node 1**		**Principal Aquifer**	
Path 1 Process	Declining source		ADRD (1D) + Dilution		ADRD (1D) + Dilution		ADRD (1D) + Dilution		Monitoring Borehole	
Path 1 Standards									Target Standard	MRV
Path 1 Parameter1	**Q_managed [m3/s]**	0.000E+00	**Velocity [m/s]**	1.250E-08	**Velocity [m/s]**	5.185E-04	**Velocity [m/s]**	1.037E-05		
Path 1 Parameter2	**Managed time [years]**	0.000E+00	**Dispersivity [m]**	0.1	**Dispersivity [m]**	0.4	**Dispersivity [m]**	0.0		
Path 1 Parameter3	**Q_path [m3/s]**	5.818E-04	**Travel Distance [m]**	1.0	**Travel Distance [m]**	3.5	**Travel Distance [m]**	0.0		
Path 1 Parameter4	**Q_decline [m3/s]**	5.818E-04	**Mixing Depth [m]**		**Mixing Depth [m]**		**Mixing Depth [m]**	10.0		
Path 1 Parameter5			**Mixing Width [m]**		**Mixing Width [m]**		**Mixing Width [m]**	246.0		
Path 1 Parameter6			**Q_Dilute [m3/s]**	0.000E+00	**Q_Dilute [m3/s]**	0.000E+00	**Q_Dilute [m3/s]**	6.888E-03	**Q_dilute [m3/s]**	0.000E+00

Path 2	Section 1		Section 2		Section 3		Section 4		Section 5	
Path 2 Type	Source		Unit		Unit		Unit		Receptor	
Path 2 Name	**Infill**		**Geo Barrier: Node 2**		**Sst Unsaturated: Node 2**		**Sst Saturated: Node 2**		**Principal Aquifer at Site Boundary**	
Path 2 Process	Declining source		ADRD (1D) + Dilution		ADRD (1D) + Dilution		ADRD (1D) + Dilution		Monitoring Borehole	
Path 2 Standards									Target Standard	MRV
Path 2 Parameter1	**Q_managed [m3/s]**	0.000E+00	**Velocity [m/s]**	1.250E-08	**Velocity [m/s]**	5.185E-04	**Velocity [m/s]**	1.037E-05		
Path 2 Parameter2	**Managed time [years]**	0.000E+00	**Dispersivity [m]**	0.1	**Dispersivity [m]**	0.4	**Dispersivity [m]**	10.4		
Path 2 Parameter3	**Q_path [m3/s]**	5.818E-04	**Travel Distance [m]**	1.0	**Travel Distance [m]**	3.5	**Travel Distance [m]**	103.5		
Path 2 Parameter4	**Q_decline [m3/s]**	5.818E-04	**Mixing Depth [m]**		**Mixing Depth [m]**		**Mixing Depth [m]**	10.0		
Path 2 Parameter5			**Mixing Width [m]**		**Mixing Width [m]**		**Mixing Width [m]**	246.0		
Path 2 Parameter6			**Q_Dilute [m3/s]**	0.000E+00	**Q_Dilute [m3/s]**	0.000E+00	**Q_Dilute [m3/s]**	6.888E-03	**Q_dilute [m3/s]**	0.000E+00

SIMULATION PARAMETERS

Monte Carlo Analysis with Crystal Ball

Reported Percentile	95
Number of simulations	10000

☐ Stop on calculation error

☐ Use same sequence of random numbers

Minimise while running:

◉ Nothing

○ All Spreadsheets (faster)

○ Microsoft Excel (fastest)

Named Constants

s_per_year	31557600
s_per_day	86400

Laplace Transform Solution Parameters

sigma	0
nu	1
nsum	16
omega	11

Reporting Options

☑ Include Remedial Targets and Attenuation Factors on the results sheets in Advanced level

☐ Use the array form of the RAM function

☑ Include a set of timeslices for each contaminant in each pathway

Number of timeslices for breakthrough curves: 20

The timeslices specified on the results sheets are saved below.

Path1 timeslices in years

TS_Path1_Spec1	TS_Path1_Spec2	TS_Path1_Spec3	TS_Path1_Spec4
1	1	1	1
2	2	2	2
5	5	5	5
10	10	10	10
15	15	15	15
20	20	20	20
30	30	30	30
40	40	40	40
50	50	50	50
60	60	60	60
70	70	70	70
80	80	80	80
90	90	90	90
100	100	100	100
120	120	120	120
140	140	140	140
160	160	160	160
180	180	180	180
200	200	200	200
250	250	250	250

Path2 timeslices in years

TS_Path2_Spec1	TS_Path2_Spec2	TS_Path2_Spec3	TS_Path2_Spec4
1	1	1	1
2	2	2	2
5	5	5	5
10	10	10	10
15	15	15	15
20	20	20	20
30	30	30	30
40	40	40	40
50	50	50	50
60	60	60	60
70	70	70	70
80	80	80	80
90	90	90	90
100	100	100	100
120	120	120	120
140	140	140	140
160	160	160	160
180	180	180	180
200	200	200	200
250	250	250	250

BREAKTHROUGH RESULTS

Site Name: "Sandy Lane RAM1"

Advanced

Barrier Thickness	1 m	Benzene Half Life	198 Days
Barrier k	5.00E-09 m/s		

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer

Concentrations in mg/L in Principal Aquifer

Compared with MRV target concentration in mg/L

	1.000E-05		2.000E-04		1.000E-03		5.000E-08
	Species1		Species2		Species3		Species4
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	0.000E+00	1	0.000E+00	1	1.049E-09	1	0.000E+00
2	0.000E+00	2	0.000E+00	2	1.290E-05	2	0.000E+00
5	0.000E+00	5	0.000E+00	5	4.138E-04	5	0.000E+00
10	0.000E+00	10	0.000E+00	10	3.028E-04	10	0.000E+00
15	0.000E+00	15	0.000E+00	15	1.892E-04	15	0.000E+00
20	0.000E+00	20	0.000E+00	20	1.181E-04	20	0.000E+00
30	0.000E+00	30	9.626E-33	30	4.607E-05	30	0.000E+00
40	0.000E+00	40	0.000E+00	40	1.797E-05	40	0.000E+00
50	1.597E-36	50	0.000E+00	50	7.009E-06	50	0.000E+00
60	4.977E-33	60	8.848E-24	60	2.734E-06	60	0.000E+00
70	0.000E+00	70	0.000E+00	70	1.066E-06	70	0.000E+00
80	7.049E-29	80	1.102E-21	80	4.158E-07	80	0.000E+00
90	0.000E+00	90	0.000E+00	90	1.622E-07	90	0.000E+00
100	9.883E-27	100	4.467E-20	100	6.326E-08	100	0.000E+00
120	0.000E+00	120	3.278E-19	120	9.622E-09	120	0.000E+00
140	9.992E-24	140	1.897E-16	140	1.463E-09	140	0.000E+00
160	0.000E+00	160	1.375E-14	160	2.214E-10	160	0.000E+00
180	4.191E-22	180	3.786E-13	180	3.252E-11	180	0.000E+00
200	0.000E+00	200	5.276E-12	200	3.728E-12	200	0.000E+00
250	1.529E-18	250	5.681E-10	250	0.000E+00	250	0.000E+00
300	4.594E-16	300	1.198E-08	300	0.000E+00	300	0.000E+00
350	2.591E-14	350	1.000E-07	350	0.000E+00	350	0.000E+00
400	5.143E-13	400	4.699E-07	400	0.000E+00	400	0.000E+00
450	5.102E-12	450	1.510E-06	450	0.000E+00	450	0.000E+00
500	3.121E-11	500	3.730E-06	500	0.000E+00	500	0.000E+00
550	1.346E-10	550	7.624E-06	550	0.000E+00	550	0.000E+00
600	4.472E-10	600	1.354E-05	600	0.000E+00	600	0.000E+00
650	1.217E-09	650	2.161E-05	650	0.000E+00	650	0.000E+00
700	2.834E-09	700	3.175E-05	700	0.000E+00	700	0.000E+00
750	5.830E-09	750	4.367E-05	750	0.000E+00	750	0.000E+00
800	1.085E-08	800	5.697E-05	800	0.000E+00	800	0.000E+00
850	1.861E-08	850	7.120E-05	850	0.000E+00	850	0.000E+00
900	2.982E-08	900	8.588E-05	900	0.000E+00	900	0.000E+00
950	4.515E-08	950	1.006E-04	950	0.000E+00	950	0.000E+00
1000	6.516E-08	1000	1.149E-04	1000	0.000E+00	1000	0.000E+00
1050	9.027E-08	1050	1.285E-04	1050	0.000E+00	1050	0.000E+00
1100	1.207E-07	1100	1.411E-04	1100	0.000E+00	1100	0.000E+00
1150	1.567E-07	1150	1.527E-04	1150	0.000E+00	1150	0.000E+00
1200	1.980E-07	1200	1.629E-04	1200	0.000E+00	1200	0.000E+00

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary

Concentrations in mg/L in Principal Aquifer at Site Boundary

Compared with MRV target concentration in mg/L

	1.000E-05		2.000E-04		1.000E-03		5.000E-08
	Species1		Species2		Species3		Species4
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	0.000E+00	1	0.000E+00	1	6.293E-13	1	0.000E+00
2	0.000E+00	2	0.000E+00	2	1.005E-06	2	0.000E+00
5	0.000E+00	5	0.000E+00	5	2.157E-04	5	0.000E+00
10	0.000E+00	10	0.000E+00	10	1.753E-04	10	0.000E+00
15	0.000E+00	15	0.000E+00	15	1.095E-04	15	0.000E+00
20	0.000E+00	20	0.000E+00	20	6.841E-05	20	0.000E+00
30	0.000E+00	30	0.000E+00	30	2.668E-05	30	0.000E+00
40	0.000E+00	40	0.000E+00	40	1.041E-05	40	0.000E+00
50	0.000E+00	50	0.000E+00	50	4.059E-06	50	0.000E+00
60	0.000E+00	60	8.965E-35	60	1.583E-06	60	0.000E+00
70	0.000E+00	70	3.464E-31	70	6.175E-07	70	0.000E+00
80	0.000E+00	80	2.467E-29	80	2.408E-07	80	0.000E+00
90	0.000E+00	90	0.000E+00	90	9.393E-08	90	0.000E+00
100	1.147E-38	100	7.180E-26	100	3.663E-08	100	0.000E+00
120	1.900E-35	120	0.000E+00	120	5.572E-09	120	0.000E+00
140	3.768E-32	140	2.782E-22	140	8.473E-10	140	0.000E+00
160	0.000E+00	160	0.000E+00	160	1.284E-10	160	0.000E+00
180	1.840E-29	180	3.686E-20	180	1.893E-11	180	0.000E+00
200	3.107E-27	200	0.000E+00	200	2.241E-12	200	0.000E+00
250	1.224E-24	250	0.000E+00	250	0.000E+00	250	0.000E+00
300	0.000E+00	300	3.245E-16	300	0.000E+00	300	0.000E+00
350	0.000E+00	350	5.920E-14	350	0.000E+00	350	0.000E+00
400	1.552E-21	400	2.988E-12	400	0.000E+00	400	0.000E+00
450	5.329E-22	450	6.013E-11	450	0.000E+00	450	0.000E+00
500	0.000E+00	500	6.376E-10	500	0.000E+00	500	0.000E+00
550	1.143E-18	550	4.249E-09	550	0.000E+00	550	0.000E+00
600	2.382E-17	600	2.001E-08	600	0.000E+00	600	0.000E+00
650	3.402E-16	650	7.223E-08	650	0.000E+00	650	0.000E+00
700	3.272E-15	700	2.118E-07	700	0.000E+00	700	0.000E+00
750	2.289E-14	750	5.263E-07	750	0.000E+00	750	0.000E+00
800	1.238E-13	800	1.144E-06	800	0.000E+00	800	0.000E+00
850	5.418E-13	850	2.229E-06	850	0.000E+00	850	0.000E+00
900	1.990E-12	900	3.967E-06	900	0.000E+00	900	0.000E+00
950	6.305E-12	950	6.541E-06	950	0.000E+00	950	0.000E+00
1000	1.763E-11	1000	1.012E-05	1000	0.000E+00	1000	0.000E+00
1050	4.429E-11	1050	1.481E-05	1050	0.000E+00	1050	0.000E+00
1100	1.015E-10	1100	2.070E-05	1100	0.000E+00	1100	0.000E+00
1150	2.146E-10	1150	2.777E-05	1150	0.000E+00	1150	0.000E+00
1200	4.233E-10	1200	3.597E-05	1200	0.000E+00	1200	0.000E+00

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer

Remedial Target Concentrations in mg/L in Infill

Species1		Species2		Species3		Species4	
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	1.000E+40	1	1.000E+40	1	5.720E+06	1	1.000E+40
2	1.000E+40	2	1.000E+40	2	4.653E+02	2	1.000E+40
5	1.000E+40	5	1.000E+40	5	1.450E+01	5	1.000E+40
10	1.000E+40	10	1.000E+40	10	1.982E+01	10	1.000E+40
15	1.000E+40	15	1.000E+40	15	3.172E+01	15	1.000E+40
20	1.000E+40	20	1.000E+40	20	5.079E+01	20	1.000E+40
30	1.000E+40	30	1.039E+28	30	1.302E+02	30	1.000E+40
40	1.000E+40	40	1.000E+40	40	3.339E+02	40	1.000E+40
50	6.261E+28	50	1.000E+40	50	8.561E+02	50	1.000E+40
60	2.009E+25	60	1.130E+19	60	2.195E+03	60	1.000E+40
70	1.000E+40	70	1.000E+40	70	5.628E+03	70	1.000E+40
80	1.419E+21	80	9.072E+16	80	1.443E+04	80	1.000E+40
90	1.000E+40	90	1.000E+40	90	3.699E+04	90	1.000E+40
100	1.012E+19	100	2.239E+15	100	9.485E+04	100	1.000E+40
120	1.000E+40	120	3.050E+14	120	6.236E+05	120	1.000E+40
140	1.001E+16	140	5.272E+11	140	4.102E+06	140	1.000E+40
160	1.000E+40	160	7.275E+09	160	2.709E+07	160	1.000E+40
180	2.386E+14	180	2.641E+08	180	1.845E+08	180	1.000E+40
200	1.000E+40	200	1.896E+07	200	1.610E+09	200	1.000E+40
250	6.541E+10	250	1.760E+05	250	1.000E+40	250	1.000E+40

Compared with source concentrations in mg/L

1.000E-02	5.000E-01	6.000E+00	1.000E+02

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer

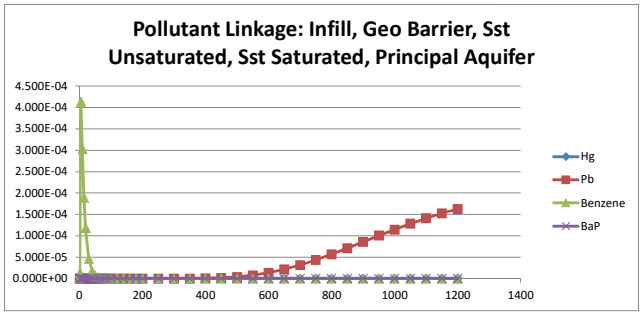
Dilution Factor

1.284E+01 *for all species and timeslices*

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer

Attenuation Factor

Species1		Species2		Species3		Species4	
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	1.000E+40	1	3.894E-02	1	1.000E+40	1	7.789E+00
2	1.000E+40	2	1.947E-02	2	1.000E+40	2	3.894E+00
5	1.000E+40	5	7.789E-03	5	1.000E+40	5	1.558E+00
10	1.000E+40	10	3.894E-03	10	1.000E+40	10	7.789E-01
15	1.000E+40	15	2.596E-03	15	1.000E+40	15	5.192E-01
20	1.000E+40	20	1.947E-03	20	1.000E+40	20	3.894E-01
30	1.000E+40	30	1.298E-03	30	4.855E+31	30	2.596E-01
40	1.000E+40	40	9.736E-04	40	1.000E+40	40	1.947E-01
50	4.877E+32	50	7.789E-04	50	1.000E+40	50	1.558E-01
60	1.565E+29	60	6.491E-04	60	5.282E+22	60	1.298E-01
70	1.000E+40	70	5.563E-04	70	1.000E+40	70	1.113E-01
80	1.105E+25	80	4.868E-04	80	4.240E+20	80	9.736E-02
90	1.000E+40	90	4.327E-04	90	1.000E+40	90	8.654E-02
100	7.881E+22	100	3.894E-04	100	1.046E+19	100	7.789E-02
120	1.000E+40	120	3.245E-04	120	1.425E+18	120	6.491E-02
140	7.795E+19	140	2.782E-04	140	2.464E+15	140	5.563E-02
160	1.000E+40	160	2.434E-04	160	3.400E+13	160	4.868E-02
180	1.859E+18	180	2.164E-04	180	1.234E+12	180	4.327E-02
200	1.000E+40	200	1.947E-04	200	8.858E+10	200	3.894E-02
250	5.094E+14	250	1.558E-04	250	8.226E+08	250	3.115E-02



Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary

Remedial Target Concentrations in mg/L in Infill

Species1		Species2		Species3		Species4	
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	1.000E+40	1	1.000E+40	1	9.534E+09	1	1.000E+40
2	1.000E+40	2	1.000E+40	2	5.969E+03	2	1.000E+40
5	1.000E+40	5	1.000E+40	5	2.781E+01	5	1.000E+40
10	1.000E+40	10	1.000E+40	10	3.422E+01	10	1.000E+40
15	1.000E+40	15	1.000E+40	15	5.477E+01	15	1.000E+40
20	1.000E+40	20	1.000E+40	20	8.770E+01	20	1.000E+40
30	1.000E+40	30	1.000E+40	30	2.249E+02	30	1.000E+40
40	1.000E+40	40	1.000E+40	40	5.765E+02	40	1.000E+40
50	1.000E+40	50	1.000E+40	50	1.478E+03	50	1.000E+40
60	1.000E+40	60	1.115E+30	60	3.790E+03	60	1.000E+40
70	1.000E+40	70	2.887E+26	70	9.717E+03	70	1.000E+40
80	1.000E+40	80	4.054E+24	80	2.491E+04	80	1.000E+40
90	1.000E+40	90	1.000E+40	90	6.388E+04	90	1.000E+40
100	8.718E+30	100	1.393E+21	100	1.638E+05	100	1.000E+40
120	5.263E+27	120	1.000E+40	120	1.077E+06	120	1.000E+40
140	2.654E+24	140	3.595E+17	140	7.082E+06	140	1.000E+40
160	1.000E+40	160	1.000E+40	160	4.674E+07	160	1.000E+40
180	5.434E+21	180	2.713E+15	180	3.169E+08	180	1.000E+40
200	3.219E+19	200	1.000E+40	200	2.677E+09	200	1.000E+40
250	8.168E+16	250	1.000E+40	250	1.000E+40	250	1.000E+40

Compared with source concentrations in mg/L

1.000E-02	5.000E-01	6.000E+00	1.000E+02

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary

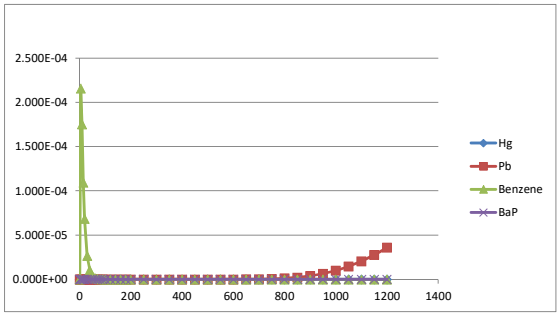
Dilution Factor

1.284E+01 *for all species and timeslices*

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary

Attenuation Factor

Species1		Species2		Species3		Species4	
Time(years	**Hg**	Time(years	**Pb**	Time(years	**Benzene**	Time(years	**BaP**
1	1.000E+40	1	3.894E-02	1	1.000E+40	1	7.789E+00
2	1.000E+40	2	1.947E-02	2	1.000E+40	2	3.894E+00
5	1.000E+40	5	7.789E-03	5	1.000E+40	5	1.558E+00
10	1.000E+40	10	3.894E-03	10	1.000E+40	10	7.789E-01
15	1.000E+40	15	2.596E-03	15	1.000E+40	15	5.192E-01
20	1.000E+40	20	1.947E-03	20	1.000E+40	20	3.894E-01
30	1.000E+40	30	1.298E-03	30	1.000E+40	30	2.596E-01
40	1.000E+40	40	9.736E-04	40	1.000E+40	40	1.947E-01
50	1.000E+40	50	7.789E-04	50	1.000E+40	50	1.558E-01
60	1.000E+40	60	6.491E-04	60	5.213E+33	60	1.298E-01
70	1.000E+40	70	5.563E-04	70	1.349E+30	70	1.113E-01
80	1.000E+40	80	4.868E-04	80	1.895E+28	80	9.736E-02
90	1.000E+40	90	4.327E-04	90	1.000E+40	90	8.654E-02
100	6.790E+34	100	3.894E-04	100	6.509E+24	100	7.789E-02
120	4.100E+31	120	3.245E-04	120	1.000E+40	120	6.491E-02
140	2.067E+28	140	2.782E-04	140	1.680E+21	140	5.563E-02
160	1.000E+40	160	2.434E-04	160	1.000E+40	160	4.868E-02
180	4.232E+25	180	2.164E-04	180	1.268E+19	180	4.327E-02
200	2.507E+23	200	1.947E-04	200	1.000E+40	200	3.894E-02
250	6.362E+20	250	1.558E-04	250	1.000E+40	250	3.115E-02



APPENDIX 3308/HRA/A2

Rogue Load Assessment RAM model

SOURCE CONCENTRATIONS: Infill

Source Data Options

- (●) Pore water concentrations
- ( ) Leaching test
- ( ) Soil contaminant concentrations

Source Type

- ( ) Constant source
- (●) Declining source

Source Geometry

Infill_Source_length	207	**m**
Infill_Source_width	246	**m**
Infill_Source_area	51128	**m2**
Infill_Source_thickness		**m**
Infill_Source_volume	975000	**m3**

General Source Properties

Infill_Source_field_capacity	**[-]**	0.2

Source Contaminant Information

Source determinand names		Hg	Pb	Benzene	BaP
Infill_Pore_water_concentration	**mg/L**	7.50E-03	0.375	4.5	75
Infill_Initial_inventory	**kg**	1.4625	73.125	877.5	14625
Infill_Input_concentration	**mg/L**	0.0075	0.375	4.5	75

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer
Concentrations in mg/L in Principal Aquifer

Compared with MRV target concentration in mg/L

1.000E-05	2.000E-04	1.000E-03	5.000E-08

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	0.000E+00	1	0.000E+00	1	7.867E-10	1	0.000E+00
2	0.000E+00	2	0.000E+00	2	9.672E-06	2	0.000E+00
5	0.000E+00	5	0.000E+00	5	3.103E-04	5	0.000E+00
10	0.000E+00	10	0.000E+00	10	2.271E-04	10	0.000E+00
15	0.000E+00	15	0.000E+00	15	1.419E-04	15	0.000E+00
20	0.000E+00	20	0.000E+00	20	8.860E-05	20	0.000E+00
30	0.000E+00	30	7.220E-33	30	3.456E-05	30	0.000E+00
40	0.000E+00	40	0.000E+00	40	1.348E-05	40	0.000E+00
50	1.198E-36	50	0.000E+00	50	5.257E-06	50	0.000E+00
60	3.733E-33	60	6.636E-24	60	2.050E-06	60	0.000E+00
70	0.000E+00	70	0.000E+00	70	7.996E-07	70	0.000E+00
80	5.287E-29	80	8.267E-22	80	3.119E-07	80	0.000E+00
90	0.000E+00	90	0.000E+00	90	1.216E-07	90	0.000E+00
100	7.412E-27	100	3.350E-20	100	4.744E-08	100	0.000E+00
120	0.000E+00	120	2.459E-19	120	7.216E-09	120	0.000E+00
140	7.494E-24	140	1.423E-16	140	1.097E-09	140	0.000E+00
160	0.000E+00	160	1.031E-14	160	1.661E-10	160	0.000E+00
180	3.143E-22	180	2.840E-13	180	2.439E-11	180	0.000E+00
200	0.000E+00	200	3.957E-12	200	2.796E-12	200	0.000E+00
250	1.147E-18	250	4.261E-10	250	0.000E+00	250	0.000E+00

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary
Concentrations in mg/L in Principal Aquifer at Site Boundary

Compared with MRV target concentration in mg/L

1.000E-05	2.000E-04	1.000E-03	5.000E-08

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	0.000E+00	1	0.000E+00	1	4.720E-13	1	0.000E+00
2	0.000E+00	2	0.000E+00	2	7.539E-07	2	0.000E+00
5	0.000E+00	5	0.000E+00	5	1.618E-04	5	0.000E+00
10	0.000E+00	10	0.000E+00	10	1.315E-04	10	0.000E+00
15	0.000E+00	15	0.000E+00	15	8.216E-05	15	0.000E+00
20	0.000E+00	20	0.000E+00	20	5.131E-05	20	0.000E+00
30	0.000E+00	30	0.000E+00	30	2.001E-05	30	0.000E+00
40	0.000E+00	40	0.000E+00	40	7.805E-06	40	0.000E+00
50	0.000E+00	50	0.000E+00	50	3.044E-06	50	0.000E+00
60	0.000E+00	60	6.724E-35	60	1.187E-06	60	0.000E+00
70	0.000E+00	70	2.598E-31	70	4.631E-07	70	0.000E+00
80	0.000E+00	80	1.850E-29	80	1.806E-07	80	0.000E+00
90	0.000E+00	90	0.000E+00	90	7.045E-08	90	0.000E+00
100	8.603E-39	100	5.385E-26	100	2.748E-08	100	0.000E+00
120	1.425E-35	120	0.000E+00	120	4.179E-09	120	0.000E+00
140	2.826E-32	140	2.086E-22	140	6.354E-10	140	0.000E+00
160	0.000E+00	160	0.000E+00	160	9.627E-11	160	0.000E+00
180	1.380E-29	180	2.764E-20	180	1.420E-11	180	0.000E+00
200	2.330E-27	200	0.000E+00	200	1.681E-12	200	0.000E+00
250	9.182E-25	250	0.000E+00	250	0.000E+00	250	0.000E+00

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer
Remedial Target Concentrations in mg/L in Infill

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	1.000E+40	1	1.000E+40	1	5.720E+06	1	1.000E+40
2	1.000E+40	2	1.000E+40	2	4.653E+02	2	1.000E+40
5	1.000E+40	5	1.000E+40	5	1.450E+01	5	1.000E+40
10	1.000E+40	10	1.000E+40	10	1.982E+01	10	1.000E+40
15	1.000E+40	15	1.000E+40	15	3.172E+01	15	1.000E+40
20	1.000E+40	20	1.000E+40	20	5.079E+01	20	1.000E+40
30	1.000E+40	30	1.039E+28	30	1.302E+02	30	1.000E+40
40	1.000E+40	40	1.000E+40	40	3.339E+02	40	1.000E+40
50	6.261E+28	50	1.000E+40	50	8.561E+02	50	1.000E+40
60	2.009E+25	60	1.130E+19	60	2.195E+03	60	1.000E+40
70	1.000E+40	70	1.000E+40	70	5.628E+03	70	1.000E+40
80	1.419E+21	80	9.072E+16	80	1.443E+04	80	1.000E+40
90	1.000E+40	90	1.000E+40	90	3.699E+04	90	1.000E+40
100	1.012E+19	100	2.239E+15	100	9.485E+04	100	1.000E+40
120	1.000E+40	120	3.050E+14	120	6.236E+05	120	1.000E+40
140	1.001E+16	140	5.272E+11	140	4.102E+06	140	1.000E+40
160	1.000E+40	160	7.275E+09	160	2.709E+07	160	1.000E+40
180	2.386E+14	180	2.641E+08	180	1.845E+08	180	1.000E+40
200	1.000E+40	200	1.896E+07	200	1.609E+09	200	1.000E+40
250	6.541E+10	250	1.760E+05	250	1.000E+40	250	1.000E+40

Compared with source concentrations in mg/L

7.500E-03	3.750E-01	4.500E+00	7.500E+01

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary
Remedial Target Concentrations in mg/L in Infill

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	1.000E+40	1	1.000E+40	1	9.534E+09	1	1.000E+40
2	1.000E+40	2	1.000E+40	2	5.969E+03	2	1.000E+40
5	1.000E+40	5	1.000E+40	5	2.781E+01	5	1.000E+40
10	1.000E+40	10	1.000E+40	10	3.422E+01	10	1.000E+40
15	1.000E+40	15	1.000E+40	15	5.477E+01	15	1.000E+40
20	1.000E+40	20	1.000E+40	20	8.770E+01	20	1.000E+40
30	1.000E+40	30	1.000E+40	30	2.249E+02	30	1.000E+40
40	1.000E+40	40	1.000E+40	40	5.765E+02	40	1.000E+40
50	1.000E+40	50	1.000E+40	50	1.478E+03	50	1.000E+40
60	1.000E+40	60	1.115E+30	60	3.790E+03	60	1.000E+40
70	1.000E+40	70	2.887E+26	70	9.717E+03	70	1.000E+40
80	1.000E+40	80	4.054E+24	80	2.491E+04	80	1.000E+40
90	1.000E+40	90	1.000E+40	90	6.388E+04	90	1.000E+40
100	8.718E+30	100	1.393E+21	100	1.638E+05	100	1.000E+40
120	5.263E+27	120	1.000E+40	120	1.077E+06	120	1.000E+40
140	2.654E+24	140	3.595E+17	140	7.082E+06	140	1.000E+40
160	1.000E+40	160	1.000E+40	160	4.674E+07	160	1.000E+40
180	5.434E+21	180	2.713E+15	180	3.169E+08	180	1.000E+40
200	3.219E+19	200	1.000E+40	200	2.677E+09	200	1.000E+40
250	8.168E+16	250	1.000E+40	250	1.000E+40	250	1.000E+40

Compared with source concentrations in mg/L

7.500E-03	3.750E-01	4.500E+00	7.500E+01

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer
Dilution Factor

1.284E+01	*for all species and timeslices*

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary
Dilution Factor

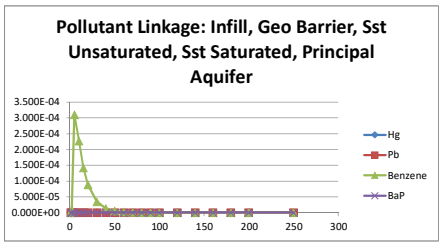
1.284E+01	*for all species and timeslices*

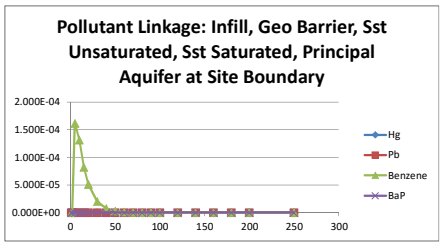
Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer
Attenuation Factor

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	1.000E+40	1	2.921E-02	1	1.000E+40	1	5.841E+00
2	1.000E+40	2	1.460E-02	2	1.000E+40	2	2.921E+00
5	1.000E+40	5	5.841E-03	5	1.000E+40	5	1.168E+00
10	1.000E+40	10	2.921E-03	10	1.000E+40	10	5.841E-01
15	1.000E+40	15	1.947E-03	15	1.000E+40	15	3.894E-01
20	1.000E+40	20	1.460E-03	20	1.000E+40	20	2.921E-01
30	1.000E+40	30	9.736E-04	30	4.855E+31	30	1.947E-01
40	1.000E+40	40	7.302E-04	40	1.000E+40	40	1.460E-01
50	4.877E+32	50	5.841E-04	50	1.000E+40	50	1.168E-01
60	1.565E+29	60	4.868E-04	60	5.282E+22	60	9.736E-02
70	1.000E+40	70	4.172E-04	70	1.000E+40	70	8.345E-02
80	1.105E+25	80	3.651E-04	80	4.240E+20	80	7.302E-02
90	1.000E+40	90	3.245E-04	90	1.000E+40	90	6.491E-02
100	7.881E+22	100	2.921E-04	100	1.046E+19	100	5.841E-02
120	1.000E+40	120	2.434E-04	120	1.425E+18	120	4.868E-02
140	7.795E+19	140	2.086E-04	140	2.464E+15	140	4.172E-02
160	1.000E+40	160	1.825E-04	160	3.400E+13	160	3.651E-02
180	1.859E+18	180	1.623E-04	180	1.234E+12	180	3.245E-02
200	1.000E+40	200	1.460E-04	200	8.858E+10	200	2.921E-02
250	5.094E+14	250	1.168E-04	250	8.226E+08	250	2.337E-02

Pollutant Linkage: Infill, Geo Barrier, Sst Unsaturated, Sst Saturated, Principal Aquifer at Site Boundary
Attenuation Factor

Species1		Species2		Species3		Species4	
Time(years	Hg	Time(years	Pb	Time(years	Benzene	Time(years	BaP
1	1.000E+40	1	2.921E-02	1	1.000E+40	1	5.841E+00
2	1.000E+40	2	1.460E-02	2	1.000E+40	2	2.921E+00
5	1.000E+40	5	5.841E-03	5	1.000E+40	5	1.168E+00
10	1.000E+40	10	2.921E-03	10	1.000E+40	10	5.841E-01
15	1.000E+40	15	1.947E-03	15	1.000E+40	15	3.894E-01
20	1.000E+40	20	1.460E-03	20	1.000E+40	20	2.921E-01
30	1.000E+40	30	9.736E-04	30	1.000E+40	30	1.947E-01
40	1.000E+40	40	7.302E-04	40	1.000E+40	40	1.460E-01
50	1.000E+40	50	5.841E-04	50	1.000E+40	50	1.168E-01
60	1.000E+40	60	4.868E-04	60	5.213E+33	60	9.736E-02
70	1.000E+40	70	4.172E-04	70	1.349E+30	70	8.345E-02
80	1.000E+40	80	3.651E-04	80	1.895E+28	80	7.302E-02
90	1.000E+40	90	3.245E-04	90	1.000E+40	90	6.491E-02
100	6.790E+34	100	2.921E-04	100	6.509E+24	100	5.841E-02
120	4.100E+31	120	2.434E-04	120	1.000E+40	120	4.868E-02
140	2.067E+28	140	2.086E-04	140	1.680E+21	140	4.172E-02
160	1.000E+40	160	1.825E-04	160	1.000E+40	160	3.651E-02
180	4.232E+25	180	1.623E-04	180	1.268E+19	180	3.245E-02
200	2.507E+23	200	1.460E-04	200	1.000E+40	200	2.921E-02
250	6.362E+20	250	1.168E-04	250	1.000E+40	250	2.337E-02





Appendix 4

Stability Risk Assessment

KEY GS

Geological & Geotechnical Consultants

Sandy Lane Quarry

Stability Risk Assessment Report (October 2022)

Prepared for: NRS Waste Care Limited

Key GeoSolutions Ltd
Nova House
Audley Avenue Enterprise Park
Newport
Shropshire
TF10 7DW

Tel. 01952 822960
Fax. 01952 822961

email info@keygs.co.uk
web www.keygs.co.uk

Job Number: 8730-001

Report Number: 8730-001-R-01

NRS Waste Care Limited

Sandy Lane Quarry

Stability Risk Assessment Report

Prepared by:

Z Lu BEng PhD MIMMM

Approved by:

B Duthie BEng CGeol FGS FIQ

Report Distribution List

Name	Copies	Rev.	Date	Copies	Rev.	Date	Copies	Rev.	Date

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TABLES

APPENDICES

DRAWINGS

1.0 INTRODUCTION

1.1 Report Context

Key GeoSolutions Limited (KGS) have been commissioned by NRS Waste Care Limited (NRS) to undertake a Stability Risk Assessment in order to assess the stability of the proposed restoration at Sandy Lane Quarry. This report has been compiled in accordance with the template issued by the EA (Ref: SRA Version 2 – November 2003), with reference to R&D Technical Reports P1-385/TR1 and TR2 where applicable.

The report provides an overview of the available data and a review of the existing ground conditions.

1.2 Conceptual Stability Site Model

This report deals with the proposed mineral extraction and the restoration with inert waste at Sandy Lane Quarry. The extent of the proposed development area of the mineral extraction and inert waste infill is shown in Drawing No. 8730-001-001.

The site is located approximately 5km to the north of Bromsgrove, 12km to the east of Kidderminster and 2km to the northwest of Junction 4 of the M5 motorway. It is located on the northeast side of the roundabout at the junction of the Sandy Lane A491 and the B4091. The site is at National Grid Reference 395,000mE 276,300mN, see Figure 1 below.

Figure 1 Site Location

The site covers an area of c. 5.5 hectares, with the A491 forming the southern boundary, Madeley Road the western boundary, to the north is agricultural land and to the east is a landfill

site operated by Veolia. Infilling at the Veolia landfill site has been completed and the site has been capped. A further operational quarry is located on the south side of the A491.

The Geological Sheet No. 182 (Droitwich) shows the site to be underlain by Wildmoor Sandstone Member of the Wilmslow Sandstone Formation, which are described as silty or argillaceous, fine to medium grained, bright orange red to dark brick-red sandstones, with subordinate siltstone and mudstone.

Boreholes drilled within the area of the Veolia landfill, locations shown on drawing number 8730-001-001 and logs included in Appendix SRA 1, confirm the BGS description, encountering generally a moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, sandstone with claystone interbeds to a depth of 50m, the base of the borehole being at a level of 104mAOD.

There are twelve groundwater monitoring boreholes installed around the perimeter of the adjacent Veolia Landfill site, four of which are adjacent to the proposed restoration area. The locations of the monitoring boreholes and ground water level contours are shown on Drawing No. 3084/HIA/10, which are taken from the hydrogeological and hydrological assessment report (HIA), dated April 2021, ref. 3084/HIA, prepared by Hafren Water Ltd.

The groundwater monitoring data as shown in Drawing No. 3084/HIA/10 indicates that groundwater levels vary in the range of 143mAOD to 146mAOD, i.e. 4 – 7m below the lowest level of the current quarry floor. A maximum groundwater level of 146mAOD has been adopted for the current assessment. Selected 2021 HIA groundwater monitoring data are included in Appendix SRA 2.

The exposed Wildmoor Sandstone faces at the site vary between 5-22m in height and have an average gradient of c. 60° from horizontal, above which there is a section of slope which is 2 - 4m high and has a gradient of c. 1V in 2H (26°), this is assumed to represent the weaker, more soil like overburden materials. The adjacent completed landfill surface rises above the crest level of the quarry faces in a dome shape at a gradient of the order of 1V in 10H (5.7°).

The excavation area will subsequently be backfilled with inert waste to achieve the proposed restoration profile as shown in Drawing Nos. 8730-001-003 and NRS-001-W.D.010 (included in Appendix SRA 3).

The mineral extraction and restoration will be carried out progressively in phases in accordance with the waste recovery plan prepared by Westbury Environmental in August 2021 (WRP). The stage 1 restoration involves the construction of a stabilisation buttress with imported inert waste along the eastern face next to the Veolia Landfill. The buttress as shown in Drawing No. 8730-

001-002 will permanently stabilise the over-steepen slopes and ensure the long-term stability of the slopes.

Following the construction of the eastern stabilisation buttress, mineral extraction and restoration will progressively take place in the rest of the excavation area. The selected drawings showing the stages and sequence of the proposed restoration scheme are included in Appendix SRA 3.

It is proposed that a 1m thick geological barrier will be constructed over the base and the sides of the excavation prior to the placement of inert waste. Given that mineral extraction is taking place during the restoration, the excavation area will be sequentially backfilled with inert waste following the completion of mineral extraction in that area.

Temporary backfill slopes will be formed during the restoration and the whole site will ultimately be restored with inert waste following the completion of mineral extraction at the site. The highest temporary slope that would potentially be formed during the restoration is the side slope of the eastern stabilisation buttress constructed in Stage 1 and the other temporary slopes will be generally less than the buttress slope. Any inert waste fill slope should have a maximum slope gradient of 1V in 2.5H (21.8°).

1.2.1 Basal Subgrade Model

The basal subgrade will be formed by in-situ strata of the Wildmoor Sandstone at an minimum elevation of 150 mAOD.

1.2.2 Side Slope Subgrade Model

The side slopes subgrade will be formed of in-situ strata of the Wildmoor Sandstone with an average slope angle of 60° from horizontal.

1.2.3 Basal Lining Model

It is proposed to install a minimum 1m thick basal geological barrier within the proposed restoration area, which will be compacted to achieve a maximum permeability of 1 x 10^{-7} m/s.

1.2.4 Side Slope Lining Model

The side slope geological barrier will consist of a minimum 1m thick layer of suitable material, which will be compacted to achieve a maximum permeability of 1 x 10^{-7} m/s. It is proposed that the barrier will be placed in lifts of a maximum height of 2m, subsequent lifts will only be constructed once the inert waste has been placed to the crest of the previous lift.

1.2.5 Waste Mass Model

The waste mass will consist of materials described as inert waste comprising construction waste, demolition and building waste.

Due to the inert nature of the waste material, leachate and gas abstraction measures are not proposed. It is proposed that restoration will be undertaken progressively as indicated on the restoration plans included in Appendix SRA 3.

The waste materials will be placed in compacted layers of thickness appropriate for the material being deposited; the maximum anticipated layer thickness is 1m with maximum lift heights of 2m and with temporary slopes in the waste no steeper than a 1v in 2.5h gradient.

The restoration design indicates that the inert waste infill will be wholly contained within the excavation void and the final restoration profile has a maximum slope angle of 5.7° from horizontal (1v:10h). However, given the restoration will be undertaken progressively in several phases, intermediate/temporary backfill slopes will be formed at a slope gradient of maximum 1v : 2.5h with slope height of maximum 20m (see drawing no. 8730-001-002).

1.2.6 Capping System Model

It is proposed that due to the inert nature of the waste materials accepted at the site and the fact there is no requirement to collect leachate or gas, there is no proposed engineered capping system.

2.0 STABILITY RISK ASSESSMENT

Each of the six principal components of the conceptual stability site model has been considered and the various elements of the component have been assessed with regard to stability.

The principal components considered are:

- the basal subgrade;
- the side slope subgrade;
- the basal lining system;
- the side slope lining system;
- the waste, and
- the capping system.

2.1 Risk Screening

Issues relating to stability and integrity for each principal component of the development have been subject to a preliminary review to determine the need to undertake further detailed geotechnical analyses. The following sections present the results of this screening exercise.

2.1.1 Basal Subgrade Screening

The stability and deformability of the basal subgrade will be ensured during the construction and in the long term by appropriate design of the components in Table SRA 2/1, below.

Table SRA 2/1

Stability Components for Basal Subgrade

Excessive Deformation	Compressible Subgrade	The basal subgrade will comprise in-situ Wildmoor Sandstone. The sandstone will be of low compressibility.
	Basal Heave	Ground water is not encountered within the quarry at subgrade level and the maximum water level recorded at the site is 4-7m below the quarry floor, hence basal heave within sandstone strata is not considered to be a problem and therefore this aspect is not considered further.
	Cavities in Subgrade	No evidence of cavities was identified during the site inspection. Natural cavities are not known to exist in the Wildmoor Sandstone strata, therefore this aspect is not considered further.

Given the foregoing, it is not considered that the basal subgrade system requires further assessment.

2.1.2 Side Slope Subgrade Screening

The controlling factors that will affect the stability and deformability of the side slope subgrade are detailed in Table SRA 2/2 below.

Table SRA 2/2

Stability Components for Side Slope Subgrade

Cut Slope	**Wildmoor Sandstone**	Stability	The side slope subgrade will be formed by in-situ Wildmoor Sandstone. These slopes will be formed at a average slope angle of 60° and a maximum height of 22m. The stability of the unconfined slopes will be considered further.
		Deformability	The in-situ Wildmoor Sandstone is considered to be essentially incompressible. Therefore, this issue does not require further consideration.
		Groundwater	No groundwater is encountered within the excavation area.

Given the foregoing, it is considered that the side slope subgrade system requires further assessment.

2.1.3 Basal Lining Screening

The basal lining system consists of 1m thick engineered geological barrier that will be placed and compacted in layers prior to the placement of inert waste. No ground water is encountered within the excavation area and the engineered basal lining system is considered to be essentially incompressible. The basal lining system will be considered as the part of the waste mass and the stability of it is considered in Section 2.1.5 below.

2.1.4 Side Slope Lining Screening

The side slope lining system will be progressively built up in maximum 2m lifts; shortly after, inert waste will be backfilled against it to a similar elevation. The controlling factors that will affect the stability and deformability of the side slope liner are detailed in Table SRA 2/3 below.

Table SRA 2/3

Stability Components for Side Slope Liner

Failure involving slope liner	Stability	The exposed clay slope at any time will be maximum 2m high, formed as a wedge of clay against the sandstone slope. Given the limited height and temporary nature of the liner slope these are not considered further.
Failure involving subgrade and waste	Stability	Phased restoration will result in the generation of temporary backfill slopes. Instability within the waste and the subgrade could potentially occur and this will be considered further.

Given the foregoing, it is considered that the side slope lining system requires further assessment.

2.1.5 Waste Mass Screening

The controlling factors that will affect the stability and deformability of the waste mass are detailed in Table SRA 2/4 below.

Table SRA 2/4

Stability Components for Waste Slopes

Failure wholly in waste	Stability	The waste materials will be placed in compacted layers of thickness appropriate for the material being deposited. Given the nature of phased restoration, temporary intermediate waste slopes will be formed at a gradient of no steeper than 1v in 2.5h. The stability of the unconfined slopes will be considered further.
Failure involving subgrade and waste	Stability	Phased restoration will result in temporary 20m high waste slopes. Instability within the waste and the basal subgrade could potentially occur and this will be considered further.
Failure in basal and/or slope lining system	Stability	The lining system form an interface between waste mass and subgrade formation. The potential instability of the temporary waste slopes may result in the movement of waste mass along the basal and/or slope liner interface and this will be considered further.

Given the foregoing, it is considered that the waste mass and lining system require further assessment.

2.1.6 Leachate Screening

No requirement for treatment of leachate has been proposed within the scheme and so this has not been considered further within this report.

2.1.7 Capping System Screening

As previously discussed in Section 1.2.6, there is no proposed capping system for the inert waste backfill; therefore, detailed geotechnical analysis is not required.

2.2 Lifecycle Phases

It is proposed that waste deposition will be progressive as areas of the excavation are completed. The inert waste will be built up in layers, following the creation of each 2m high section of slope liner, inert waste will be immediately placed adjacent to the liner.

The restoration will be completed in two major stages, of which the first stage involves the construction of a stabilisation buttress against eastern quarry faces and the second stage involves progressive restoration of areas where the mineral extraction has been completed. Following the construction of the stabilisation buttress that permanently stabilise the eastern quarry faces, restoration will continue to take place in a north to south direction as indicated on the Drawing No. NRS-001-W.D.0098.

Given the ongoing infilling operations and progressive restoration of the site, short-term temporary waste slope will be formed. The restoration area will be extended laterally and increased in height with progressive infilling and ultimately achieve the approved restoration contours of the site.

2.3 Data Summary

The following data is required as input for the analyses undertaken for this Stability Risk Assessment:

- material unit weight;
- drained and/or undrained shear strength of soil / rock and waste;
- hydrogeological conditions.

The geotechnical parameter values adopted are discussed in more detail in Section 2.6.

2.4 Selection of Appropriate Factors of Safety

The factor of safety is the numerical expression of the degree of confidence that exists, for a given set of conditions, against a particular failure mechanism occurring. It is expressed as the ratio of resisting forces against driving forces within a slope. This is readily determined by limit equilibrium slope stability analysis, which is the only type of analyses required for the current study.

Prior to determining appropriate factors of safety for the various elements of the model, it is necessary to identify key 'receptors' and evaluate the consequences in the event of failure. Consideration of the following receptors is required:

- Human beings (i.e. direct risk)
- Property – site infrastructure and third party property.

The factor of safety adopted for each component of the model would be related to the consequences of failure.

The scenario currently being analysed will represent short-term slope conditions; the temporary waste slopes will be progressively backfilled with inert waste and the entire restoration area will be increased in height to comply with the approved restoration contours of the site.

Given that the proposed backfill and excavation is contained wholly below the surrounding ground level and that no third party property or site infrastructure will be affected in the event of slope failure it is considered that a factor of safety of 1.2 is appropriate for the short-term slopes when using conservative shear strength parameters for the rock / soil types that are involved.

2.5 Justification for Modelling Approach and Software

In order to perform the Stability Risk Assessment, the components of the proposed development, as previously described in Section 1.2 of this document, have to be considered not only individually but in conjunction with one another where relevant.

It is considered that circular failure through the mass of the material (including the lining system) is the most likely form of instability. The failure of the lining system (slope and basal) may occur due to the movement of waste mass along the slope and basal lining system. Given the floor of the excavation is, sliding failure associated is not considered kinematically feasible.

With the proposed system being a simple construction, it is only necessary to employ limit equilibrium stability analyses for the derivation of factors of safety for potential failures. The limit equilibrium analyses have been undertaken using the software package SLIDE2 Version 9 (Rocscience Ltd.).

2.6 Justification of Geotechnical Parameters Selected for Analysis

The stability analyses that have been undertaken as part of this assessment have assumed various geotechnical parameters for the in-situ strata, engineered geological barrier and inert waste materials.

The parameters that have been used are summarised below in Table SRA 2/5.

Table SRA 2/5
Geotechnical Parameters Used in Analyses

Material Type	Effective Cohesion, c' (kN/m^2)	Angle of Shearing Resistance Ø' (°)	Bulk Density (kN/m^3)	Typical Description
Waste Backfill	1	25	18	Imported Inert waste
Wildmoor Sandstone	50	35	22	Weakly cemented sandstone
Geological barrier	0	26	20	Firm silty clay
Existing Landfill	0	25	18	Inert waste
Landfill Side Wall	0	35	20	Granular fill

Groundwater has not been encountered at the restoration area at the site and a maximum groundwater level of 146mAOD (4m below the quarry floor level) has been recorded at the monitoring wells. A slightly conservative Ru coefficient of 0.1 has been adopted for the stability assessment, which models the pore pressure as a fraction of the vertical earth pressure.

2.6.1 Parameters Selected for Basal Subgrade Analysis

The parameters are given in Table SRA 2/5 for the Wildmoor Sandstone have been assumed by

KGS, based upon knowledge of similar materials and ground conditions elsewhere.

2.6.2 Parameters Selected for Side Slope Subgrade Analysis

The parameters are given in Table SRA 2/5 for the Wildmoor Sandstone have been assumed by KGS, based upon knowledge of similar materials and ground conditions elsewhere.

2.6.3 Parameters Selected for Basal Liner Analysis

The parameters are given in Table SRA 2/5 for the engineered basal liner (geological barrier) has been assumed by KGS, based upon knowledge of similar materials and ground conditions elsewhere.

2.6.4 Parameters Selected for Side Slope Liner Analysis

The parameters are given in Table SRA 2/5 for the engineered side slope liner has been assumed by KGS, based upon knowledge of similar materials and ground conditions elsewhere.

2.6.5 Parameters Selected for Waste Analysis

The parameters are given in Table SRA 2/5 for inert waste has been selected based on experience of other sites and are considered slightly conservative.

2.6.6 Parameter Selected for Capping Analysis

Not applicable.

2.7 Analyses

Details of the various Stability Risk Assessment analyses undertaken for the site are presented in the following sections. The schematic cross sections (see drawing no. 8730-001-004) have been produced to represent the general slope profile through the development area. The typical cross section taken at section line location 1-1' used for the stability analysis represents the maximum height of excavation slope of the proposed of mineral extraction and maximum thickness of the proposed backfill, and hence presents the worst scenario. Therefore, it is considered that the stability risk assessment results are applicable to the whole development area.

2.7.1 Basal Subgrade Analysis

The stability of the basal subgrade will be a function of the height of the unconfined side slopes and this aspect is considered as part of the side slope subgrade analysis (Section 2.7.2).

2.7.2 Side Slope Subgrade Analysis

The stability analysis program SLIDE has been used to analyse the rotational failure using limit equilibrium analysis.

Details for the analysis are summarised below in Table SRA 2/6 and analysis outputs are

presented in Appendix SRA 4.

Table SRA 2/6

Summary of Stability Analysis for Side Slope Subgrade

Section	Failure Mechanism Analysed	FoS	Comments
SRA-01	Circular	1.12	Failure through slope subgrade
SRA-01	Circular	1.65	Failure through slope basal and slope subgrade

Minimum factors of safety (FoS) of 1.12 and 1.65 against global entire slope failure through the side slope and basal subgrade have been determined. Given the quarry faces will be stabilised with inert waste backfill and the whole site will ultimately be restored, the factors of safety are deemed acceptable for short term stability.

2.7.3 Basal Lining Analysis

The stability of the basal lining system will be a function of the waste height and the outer slope of the waste mass; therefore, the stability of the basal lining will be considered as part of the waste mass analysis (Section 2.7.5).

2.7.4 Side Slope Lining Analysis

The liner will be progressively built up in layers prior to the placement of inert waste, therefore, the stability of the side slope lining system will be considered as part of the waste mass analysis (Section 2.7.5).

2.7.5 Waste Mass Analysis

Both circular and non-circular failure mechanisms have been considered using the SLIDE2 program, with the stability of the relevant slip surfaces being analysed using vertical slice limit equilibrium methods.

Details for the analysis are summarised below in Table SRA 2/7 and analysis outputs are presented in Appendix SRA 4.

Table SRA 2/7

Summary of Stability Analysis for Waste Mass (including lining system)

Section	Failure Mechanism Analysed	FoS	Comments
SRA-02	Circular	1.18	Failure through waste mass and basal liner – shallow slip surface
		1.32	Failure through waste mass and basal liner – entire waste mass slope
		1.77	Global failure through entire slope, including subgrade, waste mass and lining system
SRA-02	Non-circular	1.27	Failure through the lining system and waste mass – lower section of the waste slope
		1.39	Failure through the lining system and waste mass – entire waste slope

A minimum factor of safety against global failure through the waste mass and lining system >1.27 has been determined; this value is deemed acceptable for short term stability. Any backfill slopes formed during the progressive restoration process are temporary slopes and the whole site will ultimately be restored.

2.7.6 Capping Analysis

Not applicable.

2.8 Assessment

2.8.1 Basal Subgrade Assessment

Assessment of the basal subgrade has been undertaken as part of the assessment of the side slope subgrade.

2.8.2 Side Slope Subgrade Assessment

The assessment of this component indicates that the stability of the basal and side slope subgrade is acceptable in the short term. This is confirmed by inspection of the existing excavated slopes within the quarry. The eastern quarry faces adjacent to the Veolia Landfill will be stabilised with inert waste backfill in the first stage of the restoration scheme to prevent erosion / slumping and ensure the long-term stability of the slopes and the Veolia Landfill.

2.8.3 Basal Lining Assessment

The stability of the basal lining has been considered as part of the waste mass analysis (Section 2.8.5).

2.8.4 Side Slope Lining Assessment

The stability of the side slope lining has been considered as part of the waste mass analysis

(Section 2.8.5).

2.8.5 Waste Mass Assessment

The waste mass analysis incorporates analyses of the lining system (basal and side slope) since these components will play a role in waste mass stability.

The assessment of this component indicates that the stability of the temporary slopes formed during the progressive restoration process is acceptable in the short term. Ultimately the whole excavation area will be backfilled with inert waste and the final restoration contours have a maximum gradient of 1v:10h (maximum 5.7° from horizontal) across the site, which will in turn improve its long-term stability.

The typical section been analysed has considered the maximum slope height and outer slope gradient of the inert waste backfill and thus represent the worst scenario. Given the ongoing and progressing backfilling operations, the slope height of the inert waste backfill will most likely be less than the maximum height used in the stability analysis and thus be more stable.

2.8.6 Capping Assessment

Not applicable.

2.9 MONITORING

2.9.1 The Risk Based Monitoring Scheme

Based upon the foregoing Stability Risk Assessment, a simple risk-based monitoring scheme is considered appropriate for the continued development of the site.

2.9.2 Basal Subgrade Monitoring

See Section 2.9.3 below.

2.9.3 Side Slope Subgrade Monitoring

The quarry excavation is subject to the inspection requirements of the Quarries Regulations 1999, it is considered that these will be adequate to monitor the stability of the excavation slopes.

It is recommended that the proposed regrading works be surveyed following completion to ensure compliance with proposed design. Monitoring during construction will comprise construction quality assurance to ensure compliance with the construction specification.

No additional instrumentation is deemed as being required during construction or post closure.

2.9.4 Basal Lining Monitoring

It is recommended that the basal lining be surveyed following completion to ensure compliance with proposed design. Monitoring during construction will comprise construction quality assurance to ensure compliance with the construction specification.

No additional instrumentation is deemed as being required during construction or post closure

2.9.5 Side Slope Lining Monitoring

Monitoring during construction will comprise construction quality assurance to ensure compliance with the construction specification.

No additional instrumentation is deemed as being required during construction or post closure.

2.9.6 Waste Mass Monitoring

Prior to placement of any waste / restoration fills the suitability of the waste mass (upper surface) will be confirmed by a competent person. Any soft or wet areas will need to be removed and replaced with suitable granular fill. Monitoring during construction will comprise construction quality assurance to ensure compliance with the construction specification.

Sandy Lane Quarry site personnel to undertake daily inspections of the waste mass to confirm its stability, a written record of all inspections to be maintained.

2.9.7 Capping System Monitoring

Not applicable.

APPENDIX SRA 1

BGS Borehole Logs

SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 1 of 5

Sample No.	Fracture Index TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
		.00	152.30			>.00
		0 1.00	151.30	OPEN HOLE.		1.00
	100 (16) 0	1 1.50		Slightly to moderately weathered, weak to moderately weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE.	1.00-1.90 JOINT, orientation 0°-10°, rough, extremely narrow to tight, infilled with mica flakes.	1.90
	100 (25) 0	2 1.90				
	100 (83) 50	3 3.00	150.29	Weak, fissured, red brown, sandy, MARL, (very low plastic).	1.90-3.00 JOINT, orientation 0°-20°, planar, rough, very narrow, infilled with very stiff, red brown, low plastic, silty CLAY (MARL). 2.00 JOINT, orientation 70°, planar, rough, tight. 2.70 JOINT, orientation 80°, planar, rough, tight.	1.06
	85 (20) 20	4 4.12		Slightly weathered, moderately weak, thinly bedded, light red brown to red brown, fine to medium, micaceous, SANDSTONE, with weak, medium bedded, bands of SANDSTONE.		3.96
	94 (67) 34	5 5.00 5.50	146.80		4.20-5.50 JOINT, orientation 15°, planar, rough, tight.	
	80 (44) 0	6 6.50		Slightly to moderately weathered, moderately weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE, with some pockets of very stiff, low plastic, fissured, CLAY (MARL) and grey fine SAND.	5.50-10.00 JOINT, orientation 0°-20°, planar and irregular, narrow to tight, infilled with very stiff, red brown, low plastic CLAY and some joints infilled with silvery MICA flakes.	2.36
	92 (78) 48	7 7.86	144.44			
	103 (13) 0	8 8.64				
	100 (55) 40	9 10.00		Slightly to highly weathered, weak, red brown, fine to medium, micaceous, SANDSTONE.		2.14

COMMENTS

Standpipe installed on 6-8-1991.
Borehole grouted up from GL to 44.0 mBGL.
Bentonite pellets seal from 44.0 to 45.2 mBGL.
Sand filter from 45.2 to 48.2 mBGL.
Response zone from 45.25 to 48.2 mBGL.

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SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 2 of 5

Sample No.	Fracture Index (/m)	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			10.00	142.30			
		56 (44) 20	10		Slightly to highly weathered, weak, red brown, fine to medium, micaceous, SANDSTONE.	10.00-14.80 JOINT, orientation 15°, planar, rough, extremely narrow to tight.	4.80
					Slightly weathered, moderately weak, medium bedded, red brown, SANDSTONE.	10.85 JOINT, orientation 60°, planar, rough, tight.	1.80
			11.60	140.70			
		140 (22) 0	11		Very weak, red brown, fine to medium, SAND.	Disturbed core.	.50
			12.10	140.20			
		109 (82) 40	12				
			13.20				
		75 (50) 37	13		Slightly weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, degrading down to very weakly cemented SAND.	13.60 JOINT, orientation 60°, planar, rough, tight.	4.10
			14.80				
		96 (84) 62	15.00			14.80-16.20 JOINT, orientation 15°-25°, planar, rough, extremely narrow to tight.	
			14				
			16.20	136.10			
		92 (24) 14	15		Red brown, fine to medium, SAND.		1.00
				135.10	Slightly weathered, weak, medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.42
			17.52	134.68			
		80 (20) 13	16	134.00	Red brown, SAND.	The last 2 runs; The top end of the core is possibly disturbed (washed out) due to hydraulic extrusion.	.68
			18.87			18.30-20.39 JOINT, orientation 10°-15°, planar, rough, extremely narrow to tight.	
		102 (82) 66	17		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		2.13
			20.00				

COMMENTS STRATIGRAPHIC UNIT: UPPER MOTTLED SANDSTONE (WILDMOOR SANDSTONE)

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SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 3 of 5

Sample No.	Fracture Index f/m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			20.00				
			20.39				
		75 (63) 25	18		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		1.93
			21.93	130.37			
		60 (0) 0	19		SAND.	Totally disturbed, very weakly cemented band of SAND (flushed out core).	1.00
			22.93	129.37			
		87 (35) 7	20		Slightly weathered, very weak, very thinly to thinly bedded, red brown, fine to medium, micaceous, SANDSTONE.	Core partly flushed.	1.50
			24.43	127.87			
		110 (0) 0	21		Slightly weathered, very weakly cemented, red brown, SAND.	Very poor recovery, due to very weakly cemented, loose sand.	1.00
			25.43	126.87			
				126.60	Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.77
				126.20	Very weakly cemented, red brown, SAND.	Cohesive behaviour of sample due to fine silt contents.	.40
		83 (44) 0	22		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	26.10-27.00 JOINT, orientation 20°, rough, extremely narrow to tight.	.90
			27.06	125.24			
		87 (9) 0	23		Loose, red brown, fine to medium, SAND.	Sand probably disturbed due to drilling.	1.50
			28.56	123.74			
				123.20	Slightly weathered, weak, red brown, fine to medium, SANDSTONE.	28.60-29.00 JOINT, orientation 15°, planer, rough.	.54
		87 (17) 0	24		Very dense, red brown, fine to medium, SAND.	Possibly disturbed due to drilling.	.96

COMMENTS

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SO97NE 456

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 4 of 5

Sample No.	Fracture Index Tim	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			20.06	122.24	Very dense, red brown, fine to medium, SAND.		
		87 (0) 0	25	121.74	Slightly weathered, very weak, darkish red brown, fine to medium, SANDSTONE.		
			30.86	121.44	Moderately weak, light red brown, silty, MARL.		
		92 (0) 0	26				
			32.22				
		93 (42) 29	27		Slightly weathered, very weak to moderately weak, thinly bedded, red brown, fine to medium, SANDSTONE.	32.30-41.60 JOINT, orientation 10°-20°, planar, rough, extremely narrow to tight.	
			33.40				
		66 (0) 0	28			Disturbed core due to drilling in very weak sandstone.	
			34.72	117.58			
			35.00				
		100 (90) 75	29				
			37.53		Slightly weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.		
		85 (15) 15	30				
			38.70				
		93 (84) 53	31				
			40.00				

COMMENTS

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SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 3

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 01/08/91
JKS 300	152.304	NGR SO 9524 7636	-	ROTARY DRILLING, AIR FLUSHED	Date Finish: 06/08/91
	ROTARY TABLE LEVEL 152.304				Sheet 5 of 5

Sample No.	Fracture Index Tcm	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			40.00		Slightly weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.		1.20m
			41.60	110.70			
					Slightly weathered, very stiff, fissured, red brown, low plastic, MARL.		.40
				110.30			
		81 (16) 0	32		Slightly Weathered, very weak to weak, thinly bedded, red brown, fine to medium, sandy, SANDSTONE.		1.20
				109.20			
					Soft and stiff to very stiff, laminated, red brown, plastic, MARL.	Marl band at both sides covered with silty micaceous infill.	.25
			43.45	108.85			
					Slightly weathered, very weak to weak, medium bedded, red brown, fine to medium, SANDSTONE.		.70
				108.10			
		98 (73) 45	33		Very stiff, fissured, red brown, low plastic, MARL, with firm MARL interbedded.		.35
				107.75			
					Very stiff, red brown, sandy, silty, MARL, with very stiff, interlaminated, grey white, micaceous SILT.		.20
				107.55		44.75-45.50 JOINT, orientation 15°, planar, rough, extremely tight.	
		93 (84) 83	45.00 34		Slightly weathered, weak, thinly to medium bedded, red brown, fine to medium, SANDSTONE.		.70
			45.50	106.80			
					Slightly weathered, very stiff, medium bedded, red brown, sandy, silty, MARL.		.10
				106.60			
						45.50-48.20 JOINT, orientation 15°, planar, smooth to rough, very to extremely narrow, infilled with red brown, laminated CLAY.	
		87 (81) 77	34		Slightly weathered, weak, medium bedded, red brown, SANDSTONE.		2.60
			48.20				
			50.00				

COMMENTS

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SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 1 of 5

Sample No.	Fracture Index (/m)	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			0	154.13	OPEN HOLE.		>.00 1.00
		100 (87) 51	1	153.13	Moderately weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with a few little pockets of red brown, very stiff, CLAYSTONE, and with very stiff, thinly bedded, very low plastic, sandy, silty, CLAY bands, and with every 50cm, very weakly cemented, very thinly bedded, SAND.	1.00-7.13 JOINT, orientation 10°-25°, rough, extremely narrow to tight.	4.80
		89 (58) 43	2				
		98 (87) 86	3			5.70 JOINT, orientation 80°, planar, tight.	
		103 (82) 55	4	148.53	Moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with some small pockets of claystone, and with very weakly cemented, thinly interbedded, SAND.	7.13-10.50 JOINT, orientation 15°-25°, planar, rough, tight.	4.80
		98 (35) 32	5			9.00 JOINT, orientation 80°, planar, rough, extremely narrow.	
			10.00				

COMMENTS

Standpipe installed on 9-8-1991.
Borehole grouted up from GL to 47.00 mBGL.
Bentonite pellets seal from 46.00 to 47.00 mBGL.
Sand filter form 47.00 to 50.00 mBGL.
Response zone from 47.05 to 50.00 mBGL.

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SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 2 of 5

Sample No.	Fracture Index TCR	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			10.00		Moderately weathered, weak to moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with some small pockets of claystone, and with very weakly cemented, thinly interbedded, SAND.		4.50
			10.50	143.63			
		82 (78) 64	6			10.50-11.70 JOINT, orientation 20°-30°, planar, rough, tight. 11.00 JOINT, orientation 25°, rough, moderately narrow, moderately weathered, infilled with very low plastic clay.	
			11.70		Moderately weathered, moderately weak, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE, with occasional pockets of clayey, silty sandstone, and with occasional pockets of very stiff, silty, low plastic, claystone.		8.50
		108 (95) 64	7			11.70-16.06 JOINT, orientation 0°-20°, rough, very narrow to tight, infilled with clay or mica.	
			13.00	141.13			
		100 (85) 58	8				
			14.58				
			15.00			15.00 JOINT, orientation 80°, planar, rough, tight.	
		101 (89) 78	9		Moderately weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		8.20
			16.06			16.10-22.20 JOINT, orientation 0°-20°, planar, rough, tight.	
		98 (80) 66	10				
			17.70				
		97 (87) 41	11			18.10 JOINT, orientation 50°, planar, rough, tight.	
			19.20	134.93			
		103 (89) 32	12		Slightly to moderately weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		6.50

COMMENTS STRATIGRAPHIC UNIT: UPPER MOTTLED SANDSTONE (WILDMOOR SANDSTONE)

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 08/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 3 of 5

Sample No.	Fracture Index (per 1m)	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			20.00				
			20.70				
		100 (83) 21	13		Slightly to moderately weathered, moderately weak, very thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	22.00 JOINT, orientation 80°, planar, rough, tight?.	
			22.20				
		100 (83) 37	14				
			22.80			22.80-24.30 JOINT, orientation 15°, planar, rough, tight.	
		97 (90) 47	15				
			24.30	129.83			
		83 (37) 14	16		Slightly weathered, very weakly cemented, thinly to medium bedded, red brown, fine to medium, SAND.	Disturbed core.	
			25.00	129.13	Slightly weathered, weak, thinly to medium bedded, red brown, SANDSTONE.		
			25.45	128.68		25.30 JOINT, orientation 75°, rough, ?.	
		100 (97) 87	17		Slightly weathered, moderately strong, medium bedded, red brown, fine to medium, SANDSTONE.	25.45-30.10 JOINT, orientation 10°-40°, planar, rough, tight.	
			26.95	127.18			
		94 (66) 20	18		Faintly to slightly weathered, weak to moderately weak, very thinly to mainly bedded, red brown, fine to medium, SANDSTONE.		
			28.55				
		90 (73) 26	19				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 09/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 4 of 5

Sample No.	Fracture Index /1m	TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
			30.10				
		100 (73) 29	20			30.10-37.95 JOINT, orientation 0°-25°, planar, rough, tight.	
			31.60				
		97 (87) 49	21		Faintly to slightly weathered, weak to moderately weak, very thinly to mainly bedded, red brown, fine to medium, SANDSTONE.		5.45
			33.15				
		78 (77) 41	22			33.90 JOINT, orientation 60°, planar, rough, tight.	
			35.00				
				118.73			
				118.63	Moderately weak, red brown, CLAYSTONE (MARL).		0.9
		100 (92) 66	23		Slightly weathered, weak to moderately weak, thinly to medium bedded, red brown to dark red brown, fine to medium, SANDSTONE.		1.82
			36.45				
				117.17			
		100 (79) 65	24		Very weakly cemented, thinly bedded, dark red brown, medium grained, SAND.		.68
			37.95			37.75 JOINT, orientation 50°, irregular, rough, tight.	
		87 (69) 41	25		Slightly weathered, moderately weak, thinly to medium bedded, light to dark red brown, fine to medium, micaceous, SANDSTONE, with at 40.65 pockets of loose, uncemented, mica and sand.	37.95-45.76 JOINT, orientation 10°-15°, planar, rough, tight.	8.48
			38.55			38.00 JOINT, orientation 90°, planar, rough, tight, 30cm long.	
		85 (67) 81	26				
			40.00				

COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 09/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

SO97NE 457

SANDY LANE QUARRY, BROMSGROVE
Geological Core Log Borehole No. 5

RIG	GROUND LEVEL	COORDINATES	ORIENTATION	DRILLING METHOD	Date Start: 07/08/91
JKS 300	154.13	NGR SO 9510 7618		ROTARY DRILLING, AIR FLUSHED	Date Finish: 09/08/91
	ROTARY TABLE LEVEL 154.13				Sheet 5 of 5

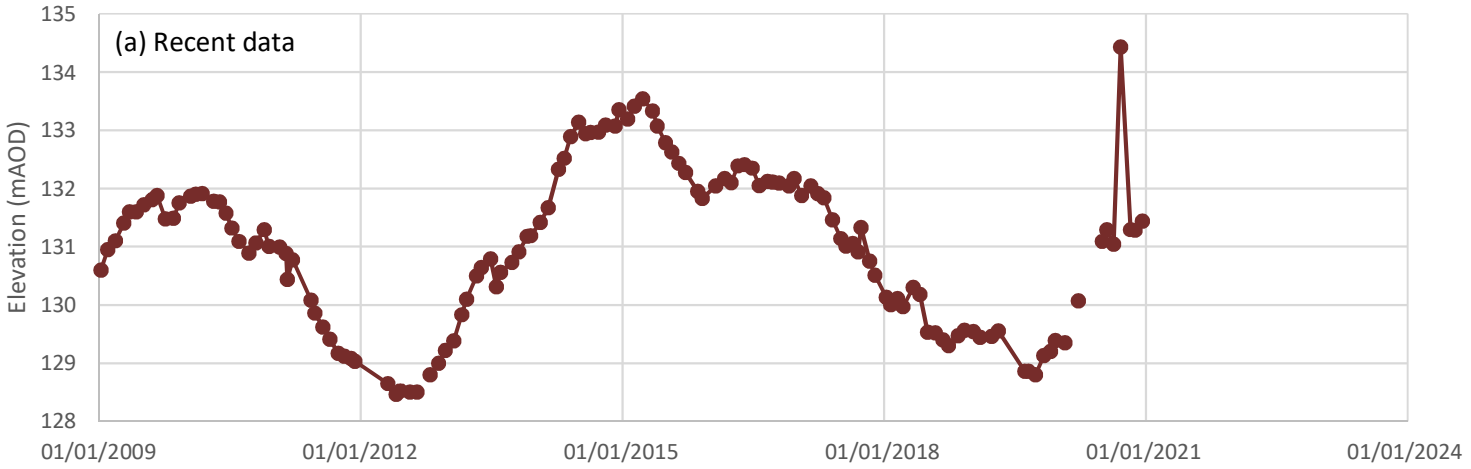
Sample No.	Fracture Index TCR (SCR) RQD	Depth (m) Core Run No	Level (m o.d.)	Main Description	Detailed Description	Legend & Thickness
		40.00		Slightly weathered, moderately weak, thinly to medium bedded, light to dark red brown, fine to medium, micaceous, SANDSTONE, with at 40.65 pockets of loose, uncemented, mica and sand.	40.70 JOINT, orientation 60°, planar, rough, extremely narrow, infilled with mica flakes.	2.45
		42.55	111.58			
				Slightly weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		.55
			111.13			
	89 (64) 39	27	111.03	Very stiff, thinly bedded, red brown, very low plastic, CLAYSTONE (MARL).	Marl between thin bands of very stiff, sandy clay.	.90
		44.35				
	92 (88) (87) 81	28 26		Slightly to moderately weathered, moderately strong, thinly to medium bedded, red brown to dark red brown, fine to medium, micaceous, SANDSTONE.		2.10
		45.76				
			107.93	Weak, medium bedded, dark red brown, medium, very micaceous, SANDSTONE.		.40
			107.53			
	96 (71) 50	29		Moderately weathered, moderately strong, medium bedded, red brown, fine to medium, micaceous, SANDSTONE.	47.20 JOINT, orientation 85°, planar, rough, tight.	.70
			106.83			
			106.73	Very stiff, thinly bedded, red brown, very low plastic, very sandy, MARL.	47.40-49.00 JOINT, orientation 10°-15°, planar, rough, extremely narrow to tight.	.90
		48.00				
				Slightly to moderately weathered, moderately strong, thinly to medium bedded, red brown, fine to medium, micaceous, SANDSTONE.		1.80
	75 (45) 30	30	105.13	Very weakly cemented, medium bedded, red brown, SAND.		.40
			104.73			
			104.63	Very stiff, thinly bedded, very low plastic, sandy, MARL.		.10
		50.00	104.53	Moderately strong, thinly bedded, fine to medium, SANDSTONE.		.50

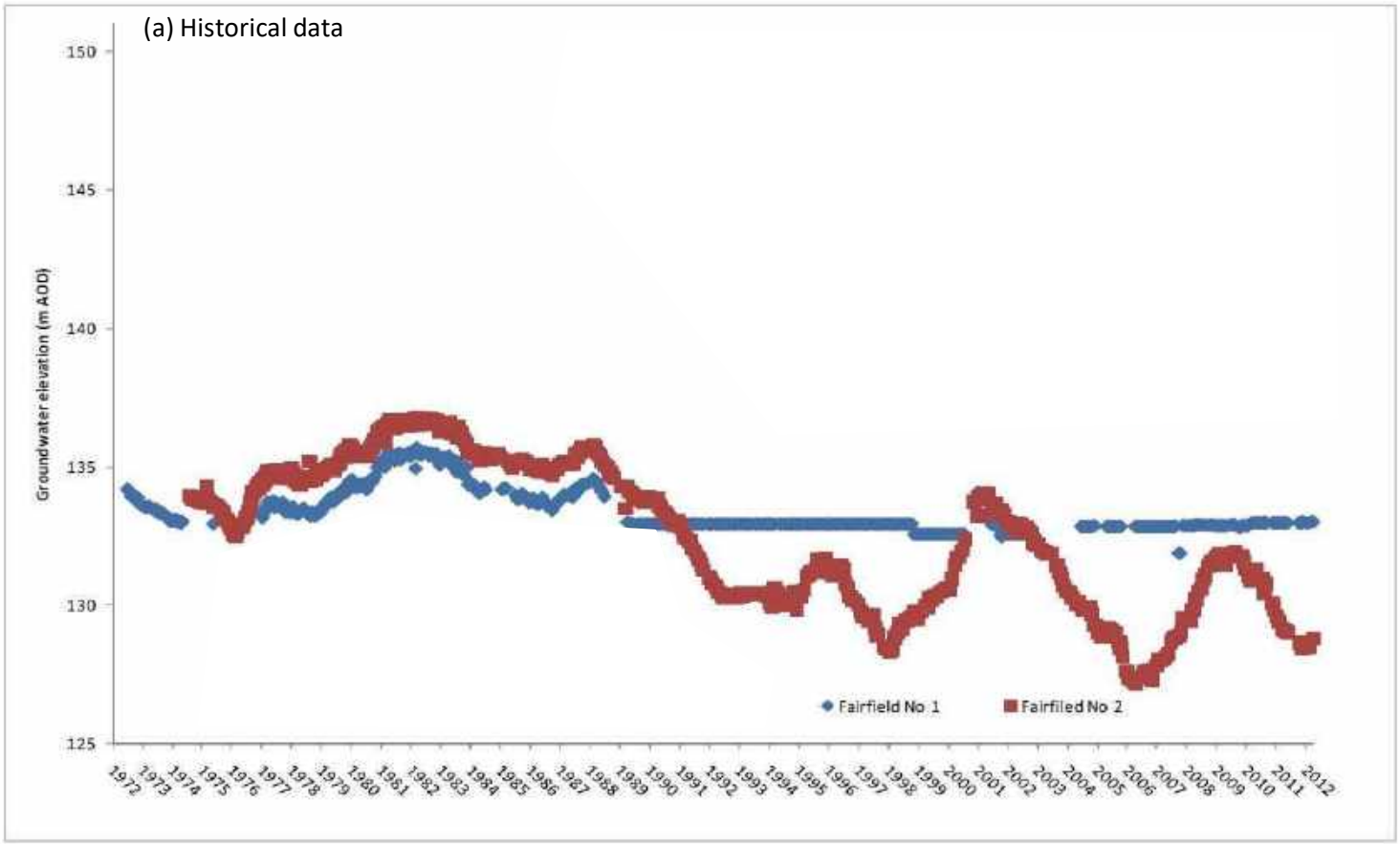
COMMENTS

Printed Date: 06/11/91	Scale 1:50
Issue No. 1	Logged By: EBF Date: 09/08/91
Revision No.	Checked By: Date:
Approved By: Date:	Approved By: Date:

APPENDIX SRA 2

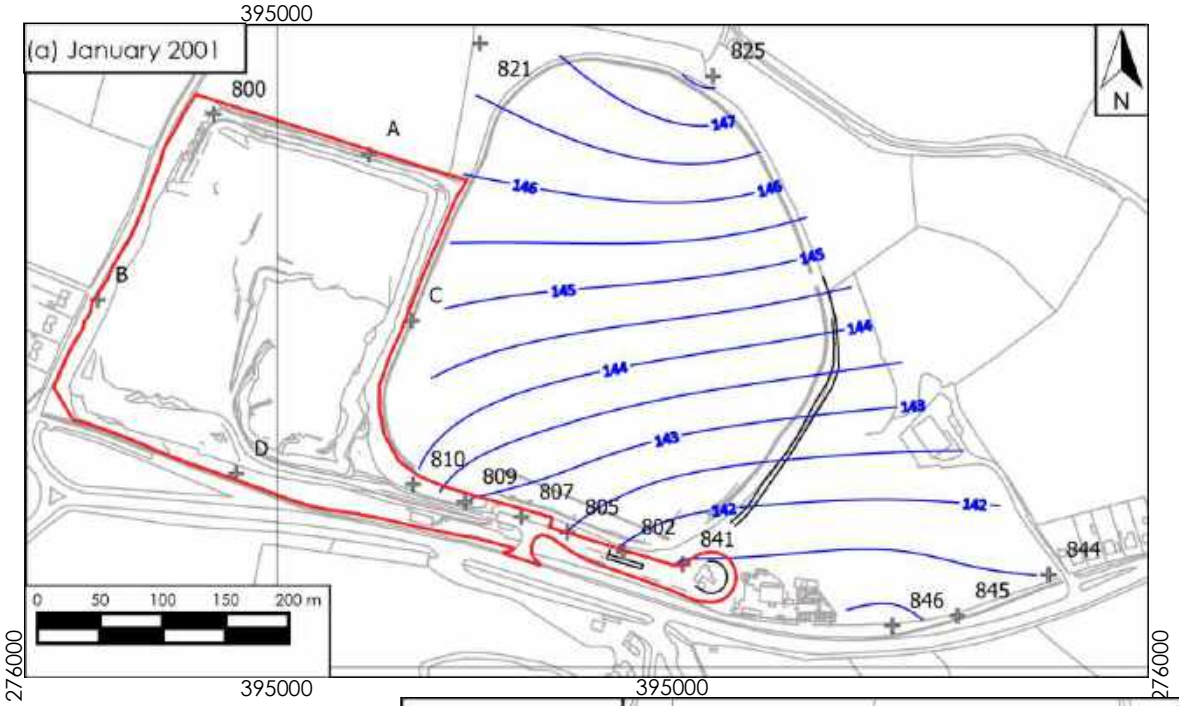
Selected Groundwater Monitoring Data from the 2021 HIA Report

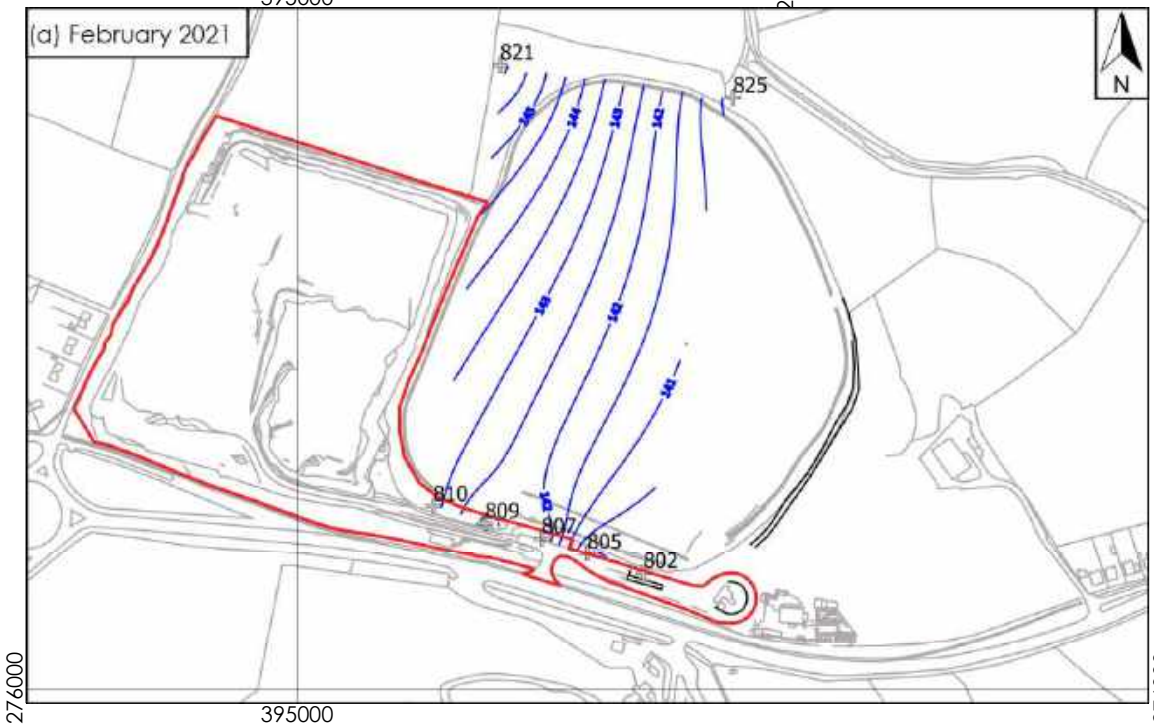




Client	NRS Bromsgrove Aggregates		
Title	Hydrographs for the Fairfield observation borehole		
Project	Sandy Lane Quarry		
Drawing	3084/HIA/07	Version	1
Date	Mar-21	Scale	n/a

hafrenwater
environmental water management
Barkers Chambers • Barker Street • Shrewsbury • United Kingdom • SY1 1SB
E: info@hafrenwater.com • *T*: 01743 355 770





Legend

- Application Boundary
- Coundwater contours
- Monitoring borehole

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Groundwater level contours
Project	Sandy Lane Quarry
Drawing	3084/HIA/10
Version	2
Date	Apr-21
Scale	1:6000

hafrenwater
environmental water management
Barkers Chambers • Barker Street • Shrewsbury • Shropshire • SY1 1SB
www.hafrenwater.com • Tel. 01743 355 770

APPENDIX SRA 3

Selected Drawings from the 2021 Waste Recovery Plan

Sandy Lane Quarry

Current Situation

Agricultural Land

Agricultural Land

Madeley Road

Harbours Hill

MADELEY ROAD

toneybridge

Pumping Station

STONEYBRIDGE

A49 - Stourbridge Road

Rosedene

Davescott

Fairfield Lodge

Farcroft

Posts

B 4091

A491 - Sandy Lane

A491

A491

A491 - Stourbridge Road

A 491

Agricultural Land

Existing Worked Out Void

AREA OF LAND REQUIRING STABILISATION

VEOLIA UK Sandy Lane Site *Restored*

Fairfield

Weighbridge & Office

Site Entrance

Sand Pit

Wildmoor Quarry - *Operational*

Sand Pit

Conveyors

Lake

Depot

WB

Path (um)

160.0 164.0 170.0 174.0 178.0 180.0 190.0 194.0 154.0 156.0 151.0 152.0 150.0

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - In-Situ Mineral
- Natural Regeneration
- 194.0 Existing 2m Contours (m aOD) & Spot Levels

Proposals:

The application Site is directly accessed off the A491 - Sandy Lane.

Enginering works are required to the eastern boundary of he Site, adjacent to the previous Sandy Lane Tip Landfill Site.

The application works would release ~ 245,000 tonnes of sand

Th engineering and restoration works will require ~ 975,000m³ of imported inert material.

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Current Situation

DATE
April 2021

REFERENCE
NRS-001-W.D.007

SCALE
1:2,500 @ A3

STATUS
FINAL

Heatons 9 The Square, Keyworth, Nottinghamshire NG12 5JT
t. 0115 937 5552 www.heatonplanning.co.uk

Sandy Lane Quarry

Stage 1 Operations

Agricultural Land

Madeley Road

Harbours Hill

Agricultural Land

Existing Peripheral Vegetation to be Retained

Base of Extraction

Temporary 5m Soil Noise Attenuation Bund

Establishment of Stabilisation Buttress

VEOLIA UK Sandy Lane Site *Restored*

STONEYBRIDGE

Pumping Station

A49 - Stourbridge Road

Rosedene

Davescott

Fairfield Lodge

Farcroft

Posts

B 4491

Access Ramp

A491 - Sandy Lane

Existing Peripheral Vegetation to be Retained

Weighbridge & Office

Site Entrance

WB

Path (um)

Sand Pit

Wildmoor Quarry - *Operational*

Lake

Conveyors

Depot

RAMP

MADELEY ROAD

160.0 164.0 170.0 174.0 178.0 180.0 190.0 194.0

Stage 1 Operations

1. Initial engineering works to involve the importation and placement of materials for use in the creation of a stabilisation Buttress along the eastern boundary of the Site's internal void. The Buttress to permanently stabilise and support the previously created Sandy Lane Landfill Site.

2. Concurrently, imported inert materials are to be placed within the south western area of the Site, to both achieve final restoration levels, and create a temporary 5m high soil screening / noise attenuation barrier. The soils within the temporary bund to be utilised at the and of the works, to help create a soil profile on top of the restored landform. Bund to be seeded and maintained.

3. On-Site sand which could be sterilised by the stabilisation and restoration works is to be extracted and removed as "as dug" material.

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- Natural Regeneration
- 194.0 — 2m Contours (m aOD) & Spot Levels
- Placement of Imported Material
- Temporary Soil Screening / Noise Attenuation Bund (5m)

Materials Audit within this Phase:

Establishment of Buttress	Imported Inert Materials: ~ 230,000m³
Progressive Restoration	Imported Inert Materials: ~ 205,000m³
Subtotal	**Imported Inert Materials: ~ 435,000m³**
Soils in Temporary Bund	Imported Soils: ~ 16,000m³

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Stage 1 Operations

DATE
April 2021

REFERENCE
NRS-001-W.D.008

SCALE
1:2,500 @ A3

STATUS
FINAL

Heatons 9 The Square, Keyworth, Nottinghamshire NG12 5JT
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Stage 2 Operations

1. On-Site sand which could be sterilised as a result of restoration works is to be extracted and removed from Site as "as dug" material.
2. Concurrently, imported inert materials are to be placed within the unrestored void to achieve restoration formation levels. These materials to be placed progressively, in a north to south direction.
3. During this stage, imported sandy / acidic soils will be either directly placed onto progressively restored land at restoration formation levels to complete and achieve a soil profile of 300mm, or, temporarily placed in soil storage bunds of up to 3m in height, within the southern area of the Site for use in achieving the final restoration soil profile.
4. All restored land to be seeded with a Species Rich Acidic Grasslad mix and placed within a 5 Year Aftercare Management Scheme.

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- Natural Regeneration
- 194.0 — 2m Contours (m aOD) & Spot Levels
- Landform / Buttress Created in Stage 1
- Temporary Soil Screening / Noise Attenuation Bund (5m)
- Temporary Soil Storage Bund(s)
- Progressive Placement of Inert Restoration Materials
- Direction of Placement of Inert Restoration Materials

Materials Audit within this Phase:

Progressive Restoration to establish Formation Levels	Imported Inert Materials: ~ 540,000m³
Soils either Directly Placed or Temporarily Stored	Imported Soils: ~ 1,000m³

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Stage 2 Operations

DATE
April 2021

REFERENCE
NRS-001-W.D.009

SCALE
1:2,500 @ A3

STATUS
FINAL

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Concept Restoration

Aim: To establish a safe and sustainabl landform which stabilises the adjacent restored Sandy Lane Tip and creates new wildlife habitat to help meet Worcestershire's Biodiversity Targets.

Restoration Land Uses:

1.11 Ha of Existing Woodland Blocks

0.88 Ha of Proposed Tree & Shrub / Woodland Fringe Vegetations

5.07 Ha of Acidic Species Rich Grassland

0.21 Surface Water Management System *(to be determined)*

LEGEND

- Application Site Boundary
- Existing Vegetation (Trees & Hedgerows)
- Buildings, Roads & Tracks
- Water Bodies
- Disturbed Ground - Mineral Operations
- 194.0 — 2m Contours (m aOD) & Spot Levels

Restoration Proposals

- Species Rich Acidic Grassland
- New Native Woodland / Tree Shrub Planting
- Surface Water Management / Wildlife Pond
- Drainage Ditches
- In-Situ Sand Face

Heatons
Planning Environment Design

PROJECT
Sandy Lane Quarry

DRAWING TITLE
Concept Restoration

DATE
April 2021

REFERENCE
NRS-001-W.D.010

SCALE
1:2,500 @ A3

STATUS
FINAL

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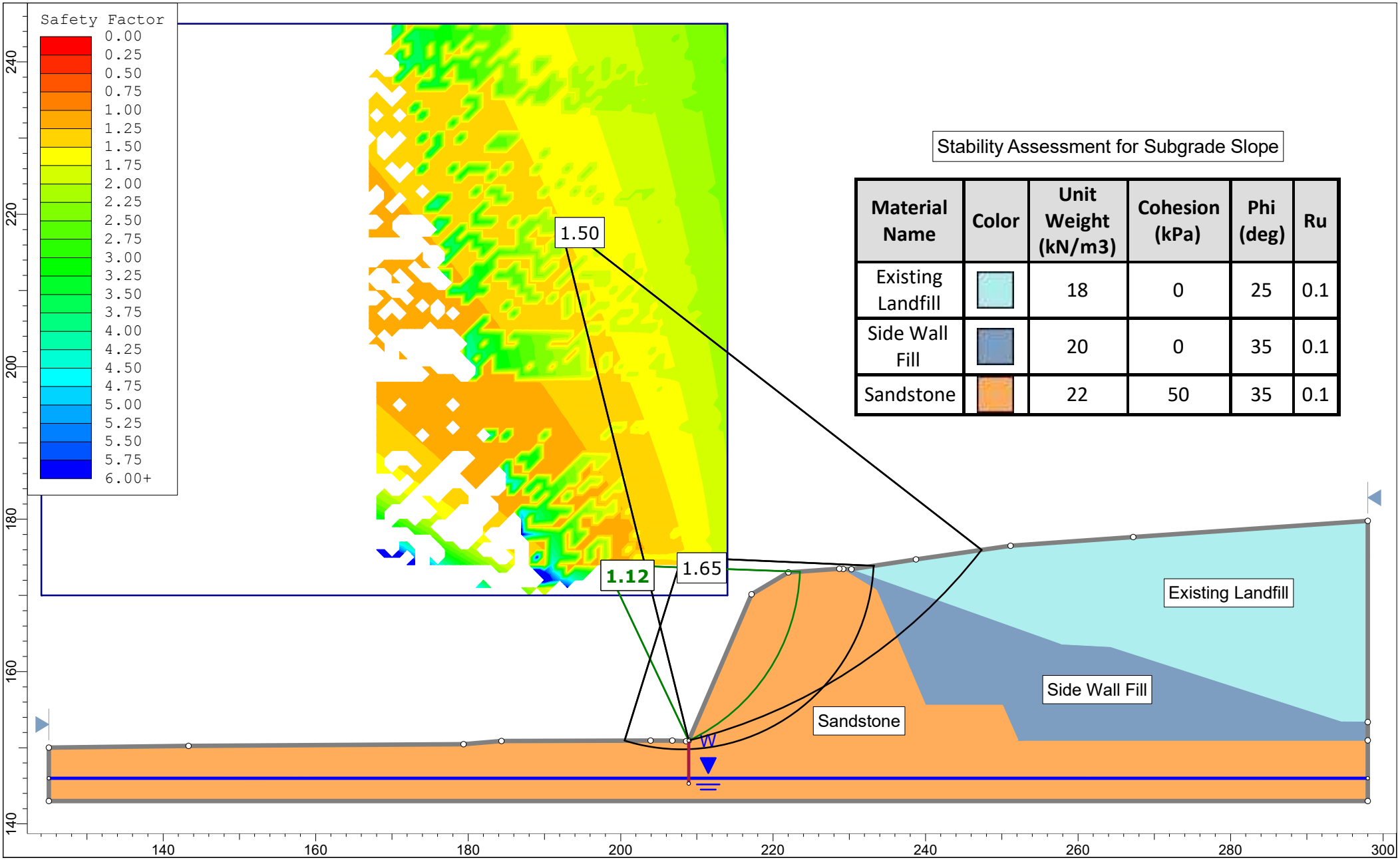
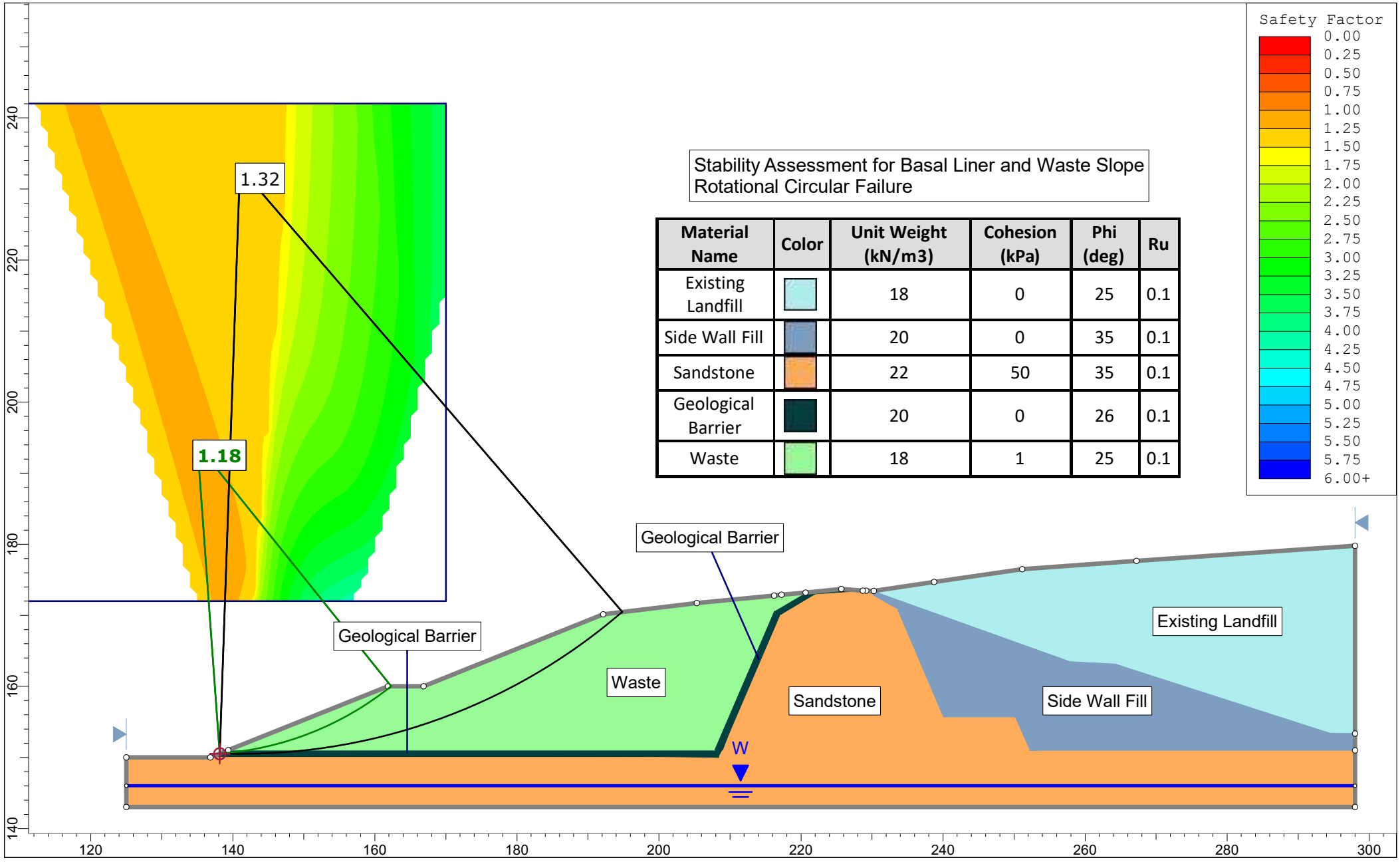
APPENDIX SRA 4

Output of Stability Analyses



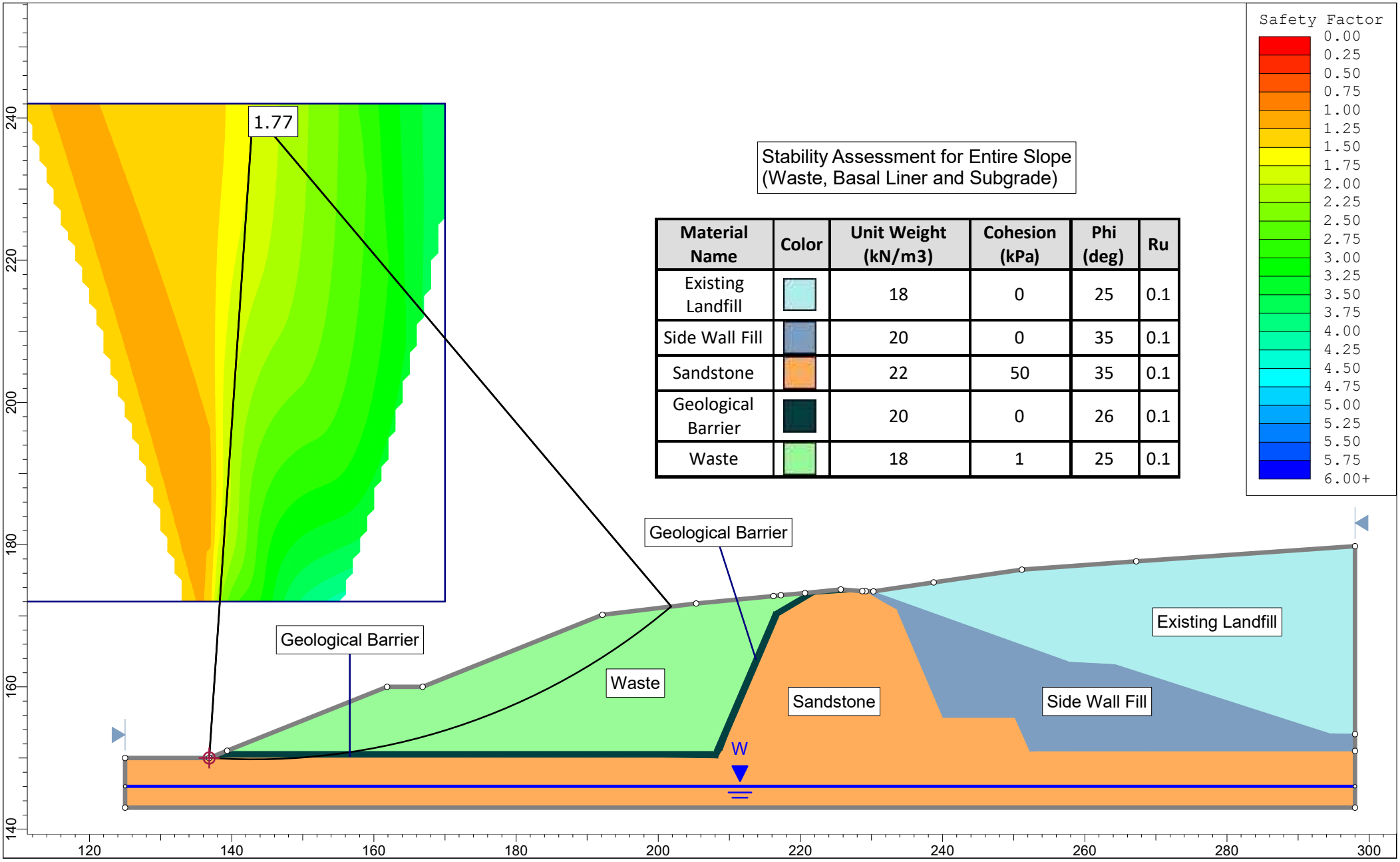
Stability Assessment for Subgrade Slope

Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)	Ru
Existing Landfill		18	0	25	0.1
Side Wall Fill		20	0	35	0.1
Sandstone		22	50	35	0.1



Stability Assessment for Basal Liner and Waste Slope
Rotational Circular Failure

Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)	Ru
Existing Landfill		18	0	25	0.1
Side Wall Fill		20	0	35	0.1
Sandstone		22	50	35	0.1
Geological Barrier		20	0	26	0.1
Waste		18	1	25	0.1

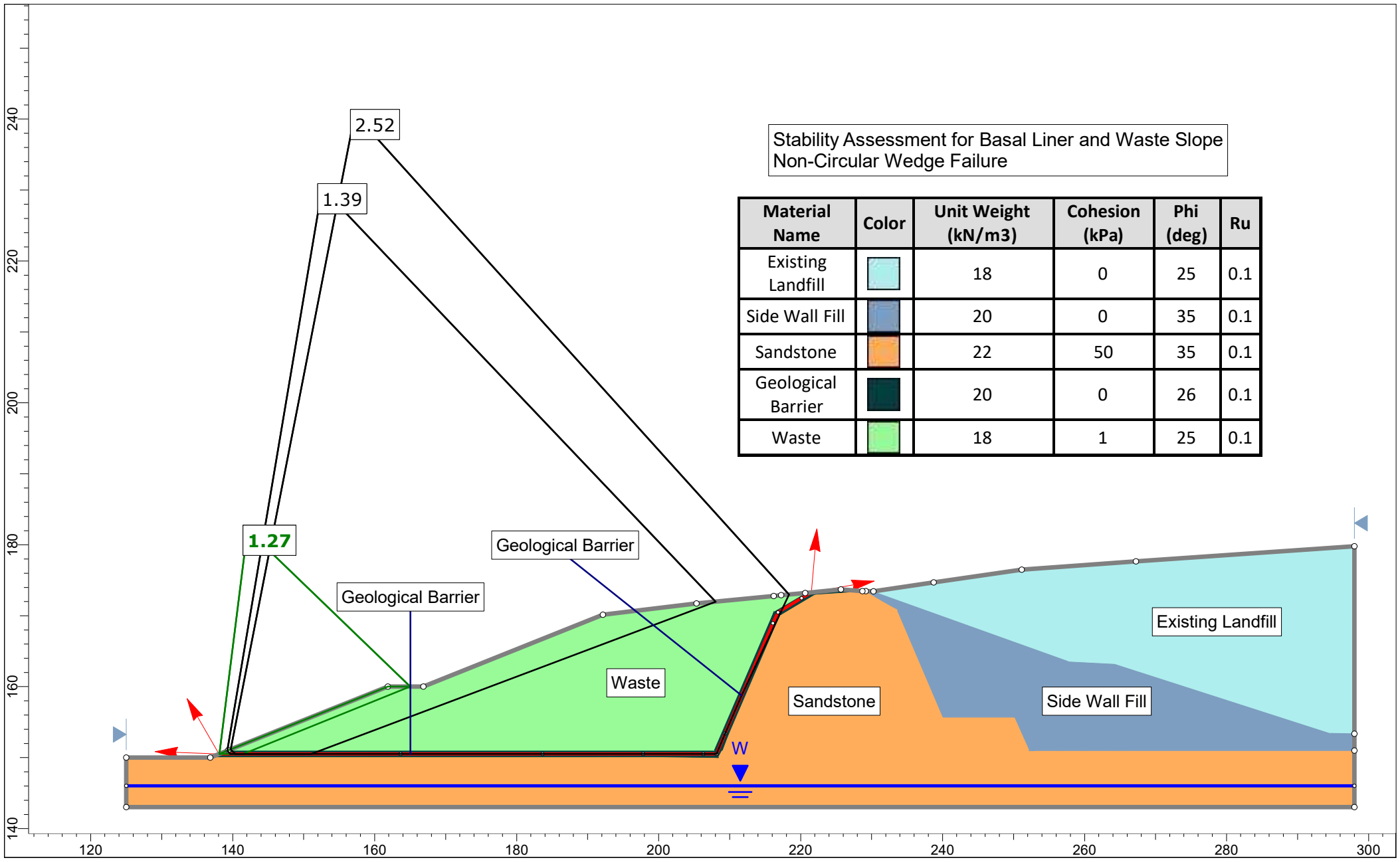


Stability Assessment for Entire Slope
(Waste, Basal Liner and Subgrade)

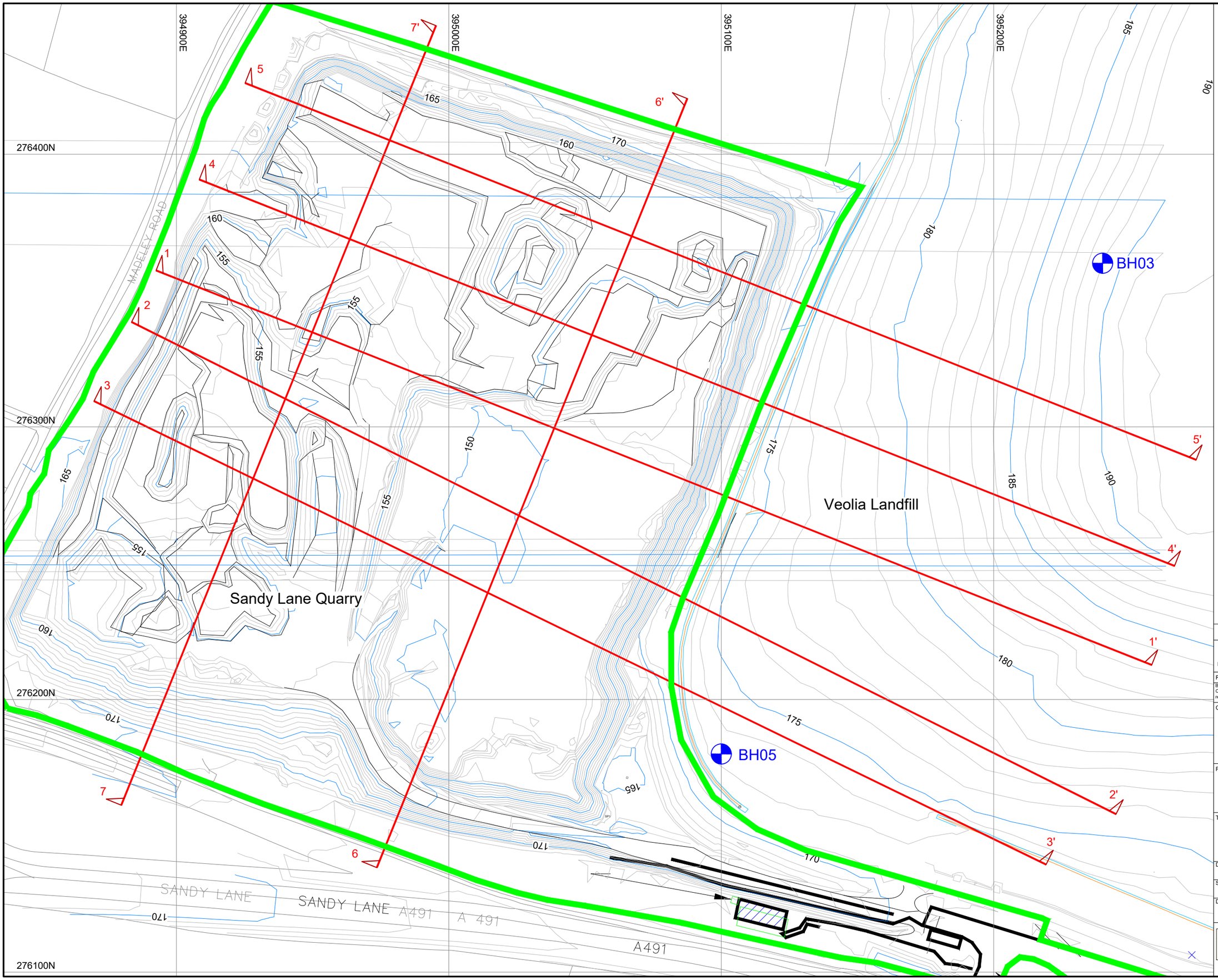
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)	Ru
Existing Landfill		18	0	25	0.1
Side Wall Fill		20	0	35	0.1
Sandstone		22	50	35	0.1
Geological Barrier		20	0	26	0.1
Waste		18	1	25	0.1

Stability Assessment for Basal Liner and Waste Slope
Non-Circular Wedge Failure

Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)	Ru
Existing Landfill		18	0	25	0.1
Side Wall Fill		20	0	35	0.1
Sandstone		22	50	35	0.1
Geological Barrier		20	0	26	0.1
Waste		18	1	25	0.1



DRAWINGS



Rev.	Revision Detail	Drawn	Date
P01	First Issue	ZL	11/10/22

CLIENT: NRS WasteCare Ltd

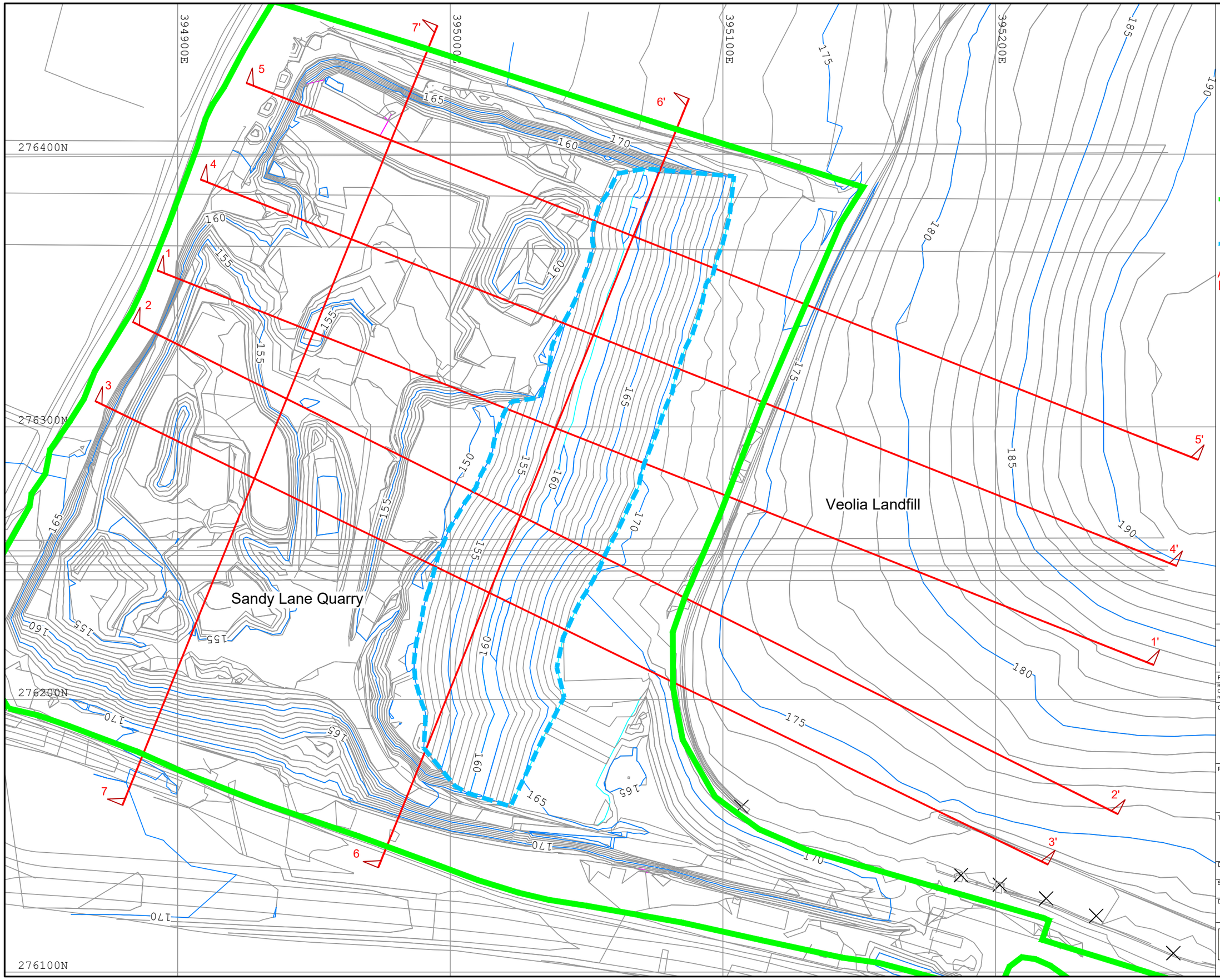
PROJECT: Sandy Lane Quarry

TITLE: Site Layout Plan

Drawn:	Checked:	Date:
ZL	BD	Oct '22
Scale: 1:1250	Original Sheet Size: A3	Status: V01

Drawing No. **8730-001-001** Revision: **P01**

KEY GS
Key GeoSolutions Ltd
Nova House
Audley Avenue
Newport
Shropshire TF10 7DW
Tel: 01952 822960
E-mail: info@keygs.com
Web: www.keygs.com



Rev.	Revision Detail	Drawn	Date
P01	First Issue	ZL	11/10/22

CLIENT: NRS WasteCare Ltd

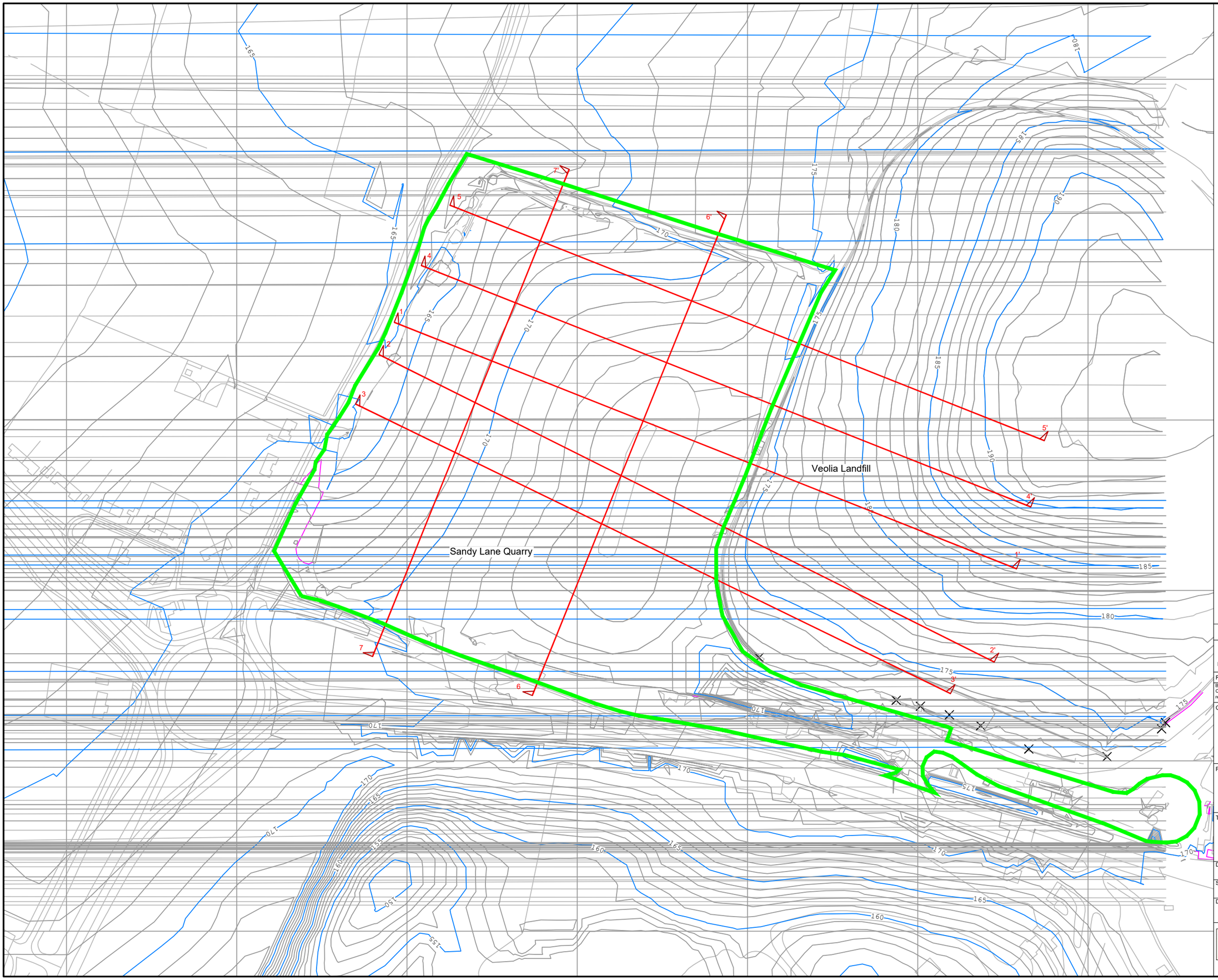
PROJECT: Sandy Lane Quarry

TITLE: Slope Stabilisation Buttress

Drawn:	Checked:	Date:
ZL	BD	Oct '22
Scale: 1:1250	Original Sheet Size: A3	Status: V01

Drawing No. **8730-001-002** Revision: **P01**

Key GeoSolutions Ltd
Nova House
Audley Avenue
Newport
Shropshire TF10 7DW
Tel: 01952 822960
E-mail: info@keygs.com
Web: www.keygs.com



Rev.	Revision Detail	Drawn	Date
P01	First Issue	ZL	11/10/22

CLIENT: NRS WasteCare Ltd

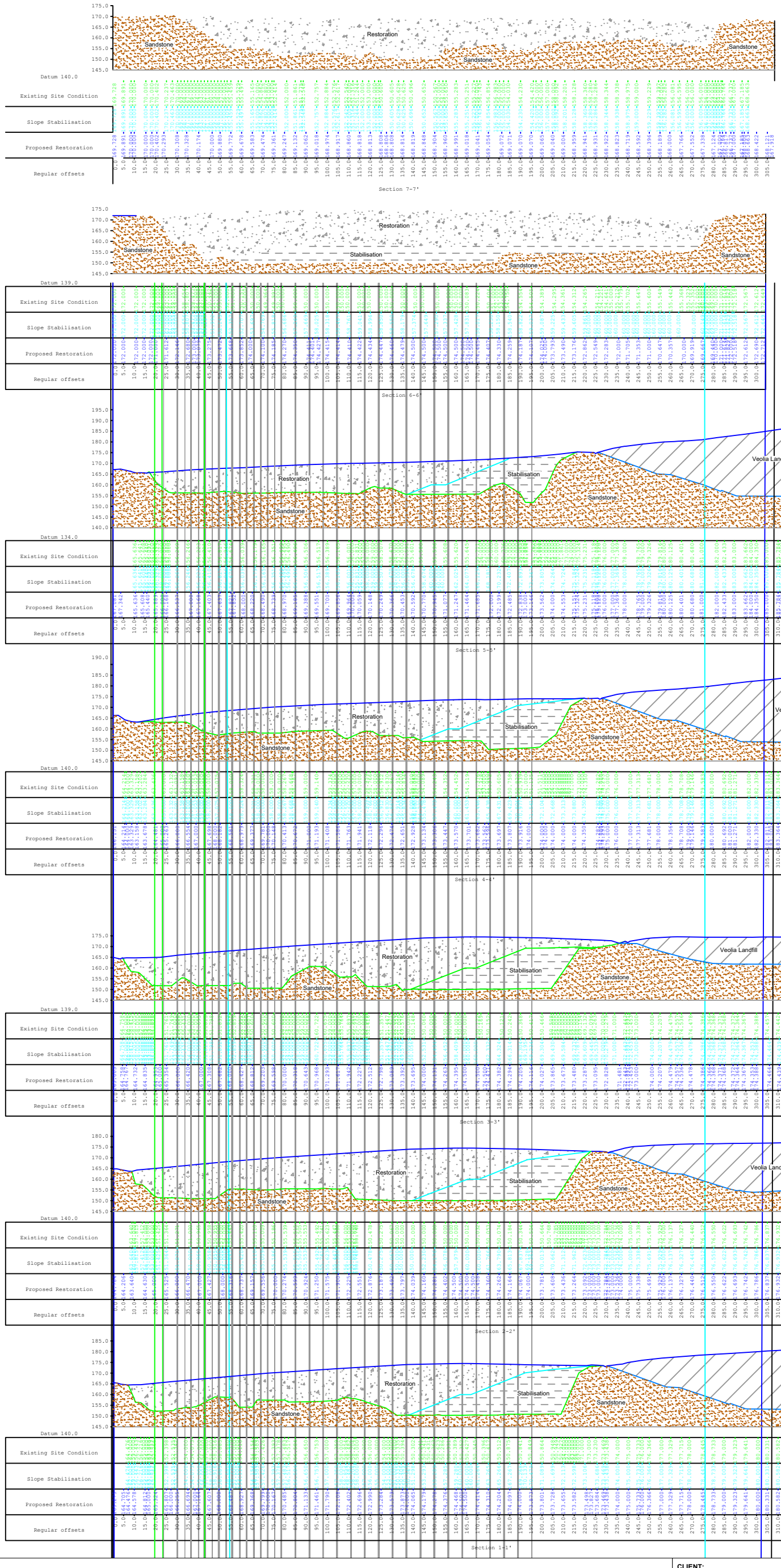
PROJECT: Sandy Lane Quarry

TITLE: Proposed Restoration Design

Drawn:	Checked:	Date:
ZL	BD	Oct '22
Scale: 1:2000	Original Sheet Size: A3	Status: V01

Drawing No. **8730-001-003** Revision: **P01**

Key GeoSolutions Ltd
Nova House
Audley Avenue
Newport
Shropshire TF10 7DW
Tel: 01952 822960
E-mail: info@keygs.com
Web: www.keygs.com



Slope Stabilisation

Proposed Restoration

Windmoor Sandstone

Veolia Landfill

REV.	REVISION DETAIL	DRAWN	DATE
P01	FIRST ISSUE	ZL	11/10/22

CLIENT:

WasteCare Ltd

KEY GEOSOLUTIONS LTD
NOVA HOUSE
AUDLEY AVENUE
NEWPORT
SHROPSHIRE TF10 7DW
TEL: 01952 822960
E-MAIL: INFO@KEYGS.COM
WEB: WWW.KEYGS.COM

PROJECT:

Sandy Lane Quarry

TITLE:

Cross Sections

DRAWN:	CHECKED:	DATE:
ZL	BD	OCT '22
SCALE:	ORIGINAL SHEET SIZE:	STATUS:
1:2000	A3	V01

DRAWING NO.: 8730-001-004

REVISION: P01

Appendix 5

Gas Risk Assessment

Gas Risk Assessment

NRS Bromsgrove Aggregates Limited

Sandy Lane Quarry restoration
Sandy Laney Lane
Wildmoor
Bromsgrove
Worcestershire
B61 0QT

WESTBURY ENVIRONMENTAL

PROVIDING SOLUTIONS, ENSURING COMPLIANCE

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk

Document Control Table

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1. Introduction

1.1. Westbury Environmental Limited has prepared this Gas Risk Assessment on behalf of NRS Bromsgrove Aggregates Limited in support of an environmental permit application.

1.2. The permit application seeks to allow the restoration of Sandy Lane Quarry via the deposit of waste for recovery. The proposed waste activity will be operated at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT (Site).

1.3. The Site will be restored using 975,000m^3 of non-biodegradable, inert material, in two main phases over a period of approximately 6 years.

1.4. This Gas Risk Assessment considers the potential source of gas production, potential pathways for any gas generated and potential receptors which could be impacted.

1.5. It is acknowledged that this Gas Risk Assessment supports an application for the deposit of waste for recovery rather than landfill. In the absence of guidance specific to waste recovery, the following guidance has been consulted in the preparation of this risk assessment. Based on the waste types to be accepted the guidance relating to inert landfill is considered appropriate to be used in preparing this Gas Risk Assessment:

- Environment Agency, Landfill Technical Guidance 03 (LFTGN03) 'Guidance on the Management of Landfill Gas', June 2014.
- Environment Agency (2007), 'Potential Gas Production from Landfilling of Inorganic Wastes', Report reference SC030144/SR, March 2007.
- Environment Agency (2007), 'Investigation and Quantification of Gas Produced from Landfilling of Inorganic Wastes' Report reference P1-516/2b, August 2007.

2. Site description

2.1. The Site is located approximately 5km to the north of Bromsgrove and 3km east of Rubery. The centre of the Site is located at National Grid Reference SO 94980 76290.

2.2. The A491, Sandy Lane, runs broadly east-west along the southern boundary of the Site. The Site is accessed from Sandy Lane at National Grid Reference SO 95199 76095.

2.3. The Site extends to approximately 5.5ha. Land-use surrounding the Site is predominantly agricultural fields.

2.4. There is an active quarry to the southeast of the Site. The land to the east of the Site is a closed non-hazardous waste landfill. The Site is bound to the west by agricultural land and to the southwest, a small cluster of residential properties.

2.5. Nearby sensitive receptors include deciduous woodland, residential properties of Stoney Bridge Estate, and workers at Wildmoor Quarry. Sensitive receptors within 1km of the Site are identified in Table 3.1.

2.6. The nearest residential properties are Stoney Bridge Estate approximately 20m west and residences off Madeley Road approximately 55m north of the Site.

3. Conceptual Gas Model

3.1. The source, pathway, receptor approach has been used to assess the potential risks of gas from the Site.

Source

3.2. The predominant potential source of gas generation is the waste to be permanently deposited at the Site. The quarry void will be progressively infilled with an estimated 975,000m^3 of waste. The area of the Site is an estimated 5.5ha and the maximum depth is estimated to be approximately 28m.

3.3. Wastes will be accepted in accordance with a Waste Acceptance Procedure, see Appendix 1 Waste Acceptance Procedure. Acceptable wastes will comprise of soil, stones, minerals and glass from a range of industries and are not biodegradable.

3.4. As stated within the Waste Acceptance Procedure, wastes with a high organic content i.e. topsoil or peat will only be deposited within 50cm of the Site surface. By limiting the acceptance of waste which are likely to have a high organic content, the risk of gas generation at depth is removed.

3.5. Gas is produced by the biological degradation of organic components. Microbial processes degrade organic matter in the absence of oxygen and produce methane and carbon dioxide. In terms of gas generation at the Site, acceptable wastes are unlikely to have significant organic content. Wastes which could have higher organic content i.e. topsoils, will be limited to placement within the upper 0.5m of the restoration. It is therefore considered that waste deposited at the Site will not give rise to gas production.

3.6. Therefore, the potential for the generation of gas from placed wastes is considered to be **negligible**.

Pathways

3.7. Several potential pathways exist which would provide a link between the sensitive receptors and any gas generated within the Site. Landfill Technical Guidance Note LFTGN03 'Guidance on the Management of Landfill Gas' (June 2014) identifies the following generic potential pathways: -

- Direct release to atmosphere.
- Sub-surface migration, through the ground or along service ducts or pipelines.
- Indirect release to atmosphere e.g. from sub-surface gas migration.
- Direct release of combustion products to atmosphere e.g. from flares/engines.

3.8. The site design will include an engineered basal and sidewall barrier comprising low permeability material, with a hydraulic permeability of a maximum 5 x 10^{-9}m/s or lower. The Site will be topped with restoration soils comprising approximately 0.3m of topsoil. The restoration contours are designed to allow shedding of rainwater to drainage features and reduce any infiltration. An engineered cap (clay or plastic) is not required.

3.9. The low permeability barrier is designed to protect risk of pollution to groundwater. It will also have the effect of providing a low permeability barrier to gas. The barriers will not be impervious to gas e.g. gas may diffuse across the low permeability layer. However, this would require pressure. The low permeability barriers will mean that in the unlikely event of gas production, the favoured pathway will be to surface where no barrier is present. The absence of a cap will allow ready ventilation of any gas produced, to atmosphere over a diffuse surface area (5.5ha).

3.10. It is considered that the primary pathway for gas generated within the Site would be vertically to atmosphere. Lateral migration through the low permeability barrier is unlikely without significant gas generation sufficient to create a motive force to drive gasses off site.

3.11. The Environment Agency report 'Investigation and Quantification of Gas Produced from Landfilling of Inorganic Wastes' (August 2007) considers the potential for gas to migrate from an inorganic or low carbon landfill site. The report acknowledges that inorganic waste does not generate substantial

quantities of landfill gas, and that there will generally be an insufficient pressure differential to drive the landfill gas through low permeability waste.

3.12. The proposed waste acceptance controls and proposed waste types mean that there is a low likelihood of depositing waste with high organic content at depths of 0.5m or more below restoration surface level. Low organic content means a low likelihood of gas generation and very low likelihood of gas generation in sufficient quantities to drive gas off site. The proposed site barriers will force any incidental gas produced to exit via surface (preferential pathway).

Receptors

3.13. A list of all receptors within 1km of the Site are presented in Table 3.1.

Table 3.1: Sensitive receptors within 1km of the Site

Ref	Receptor	Receptor type	Direction from Site Boundary	Distance from Site boundary (m)
1	Sandy Lane - A491	Road	South	5
2	Madeley Road	Road	West	10
3	Stoney Bridge Estate	Residential	West	20
4	Wildmoor Quarry	Industrial	South	25
5	Residence off Madeley Road	Residential	North	55
6	Accumix Concrete Ltd	Commercial	South	141
7	Harbours Hill	Road	Northeast	265
8	LJ Beauty Clinic	Commercial	North	295
9	Bromsgrove Van Hire	Commercial	Southwest	325
10	Meadowcroft Kennels	Commercial	West	325
11	Residence off Harbours Hill Road	Residential	Northeast	330
12	Deciduous Woodland	Deciduous Woodland	East	360
13	Westside Forestry	Commercial	Northeast	385
14	Worlifts	Commercial	East	420
15	Lake	Surface Water Feature	East	420
16	Beechcroft Nurseries & garden centre	Commercial	North	585
17	Residence off Stourbridge Road	Residential	South	600
18	Residence off Chapel Lane	Residential	North	710
19	Residence off Third Road	Residential	Southeast	760
20	Yew tree farm	Agricultural	East	900
21	Mease Farm	Agricultural	West	960

4. Gas Risk Assessment

4.1. LFTGN03 'Guidance on the Management of Landfill Gas' provides guidance on the level of risk assessment that is considered appropriate for different types of sites and states that *"Risk Screening (Tier 1) should be sufficient to deal with most of the risks from inert sites".* However, this is also dependent on the level of risk and uncertainty specific to the site.

4.2. The Site is predicted to generate *negligible* quantities of gas due to the inert nature of the waste. In addition, the Operator's strict adherence to their waste acceptance procedures and Environmental Management System will ensure that only inert waste is deposited at the Site, thus removing any uncertainty with respect to the potential for the deposition of non-inert wastes. With consideration of these preventative factors, it is considered that the overall level of risk associated with the Site is **low**. A qualitative risk assessment is therefore considered appropriate to assess the level of gas risk from the Site.

Accidents and consequences

4.3. Environment Agency guidance (LFTGN03) requires several accident and failure scenarios to be assessed in order to quantify the impact of given events. The reliability of gas control measures and Site engineering should be assessed in the risk assessment as well as the main hazards that could lead to accidental emissions. Example of general categories of accidents from LFTGN03 relevant to the Site, that may potentially affect gas control:

- Loss of containment e.g. leakage, liner failure, spillage;
- Loss of collection and/or treatment capability e.g. failure of pipework, control system;
- Explosions and fires e.g. deep seated fire; and
- Failure of leachate extraction system and the effect on landfill gas extraction.

4.4. These scenarios have been assessed as part of the gas risk screening process.

Hazards

4.5. The potential hazards that exist from gas are:

- Toxicity (acute and chronic).
- Ecotoxicity.
- Fire and explosion.
- Asphyxiation.
- Odour.

4.6. Trace components of gas pose an odour and toxicity risk whilst the bulk gases pose a risk of explosion and asphyxiation (carbon dioxide is also toxic and should be considered in the assessment of toxicity). Explosion and asphyxiation risk is generally related to sub-surface migration and accumulations in enclosed spaces, such as residential or commercial properties, or underground services. LFTGN03 states that whilst this is more difficult to quantify, for the risk screening stage, the impact assessment should be based on;

- The presence of potential pathways and site-specific receptors and
- A qualitative assessment of the severity of the consequences.

4.7. Table 4.1 to Table 4.3 allow the assessment of risk for each accident and failure scenario. This risk assessment process and scoring system is as set out in LFTGN03.

Table 4.1: Likelihood categories

	Category	Range
1	Extremely unlikely	Incident occurs less than once in a million years
2	Very unlikely	Incident occurs between once per million and once every 10,000 years
3	Unlikely	Incident occurs between once per 10,000 years and once every 100 years
4	Somewhat unlikely	Incident occurs between once per hundred years and once every 10 years
5	Fairly probably	Incident occurs between once per 10 years and once per year
6	Probable	Incident occurs at least once per year

Table 4.2: Severity categories

	Category	Definition
1	Minor	Nuisance on site only (no off-site effects) No outside complaint
2	Noticeable	Noticeable nuisance off-site e.g. discernible odours Minor breach of permitted emission limits, but no environmental harm One or two complaints from the public
3	Significant	Severe and sustained nuisance, e.g. strong offensive odours Major breach of permitted emissions limits with possibility of prosecution Numerous public complaints
4	Severe	Hospital treatment required Public warning and off-site emergency plan invoked
5	Major	Evacuation of local populace Temporary disabling and hospitalisation Serious toxic effect on beneficial or protected species Widespread but not persistent damage to land
6	Catastrophic	Major airborne release with serious off-site effects Site shutdown

Table 4.3: Severity likelihood matrix

Likelihood	Minor	Noticeable	Significant	Severe	Major	Catastrophic
Extremely unlikely	1	2	3	4	5	6
Very unlikely	2	4	6	8	10	12
Unlikely	3	6	9	12	15	18
Somewhat unlikely	4	8	12	16	20	24
Fairly probably	5	10	15	20	25	30
Probable	6	12	18	24	30	36

4.8. Table 4.4 provides a qualitative assessment of each accident failure scenario using Table 4.1 to Table 4.3.

Table 4.4: Qualitative Risk Assessment for Accident and Failure Scenarios

Accident / failure scenario	Likelihood	Severity of consequence	Score	Magnitude of risk
Loss of containment (e.g. leakage, liner failure)	Unlikely (3)	Minor (1)	3	Insignificant
Loss of collection (e.g. pipework etc)	Extremely unlikely (1)	Minor (1)	1	Insignificant
Explosions and fires	Extremely unlikely (1)	Severe (4)	4	Insignificant
Biodegradable waste input	Fairly probable (5)	Minor (1)	5	Insignificant

4.9. Table 4.5 sets out the justification for the awarding of scores.

Table 4.5: Justification for assigned 'likelihood' score

Accident / failure scenario	Justification for 'likelihood' score
Loss of containment (e.g. leakage, liner failure)	The Site will be engineered to a high standard and the engineered lining will be subject to Construction Quality Assurance (CQA) testing. It is considered extremely unlikely that the containment system will fail or leak or that any gas generated in a site with no biodegradable content to generate gasses at pressures suitable to be driven off Site/ through low-permeability barriers.
Loss of collection (e.g. pipework etc)	There will be no gas collection system. Any low or negligible concentrations of gas would remain in-situ or vent to atmosphere.
Explosions and fires	The proposed waste types are inert in nature and therefore will not be present in concentrations or quantities which would be combustible or explosive. Waste acceptance procedures will ensure that potentially flammable or explosive materials are not accepted at the Site.
Biodegradable waste input	The proposed waste types are inert (non-biodegradable) in nature. All waste entering the Site will be subject to strict waste acceptance procedures. Wastes will only be accepted onto the Site if they comply with the list of wastes authorised by the Environmental Permit. Basic characterisation will ensure that the waste is suitable for acceptance at the Site. If there is uncertainty regarding the acceptance of wastes at the Site, additional testing may be required. No waste will be accepted to the Site if there is uncertainty as to its source, conformance with the conditions of the permit and/or its suitability for the intended use. Consequently, it is considered very unlikely that biodegradable waste will be accepted at the site. Probability applied based upon the possibility of e.g. accepting a load of topsoil at depth over the course of 10 years. However the acceptance a load of topsoil at depth is unlikely to cause any offsite impacts but could cause a nuisance on site.

4.10. The results of the qualitative risk assessment show that the most significant accident /failure scenario is the acceptance of biodegradable waste into the landfill site which would arise from a failure in the Operator's implementation of the Waste Acceptance Procedures.

4.11. Strict Waste Acceptance Procedures will be in place to minimise the risk of non-compliant wastes being accepted. All Site staff will be made aware of the procedures and the requirements of the Environmental

Management System. The Waste Acceptance Procedures also detail the steps to be taken in the event that unauthorised waste is identified within a load.

4.12. As such, is it considered unlikely that biodegradable waste will be deposited within the Site, thereby removing the predominant risk of gas production.

5. Control measures and gas monitoring

5.1. The gas risk assessment concludes that the risk of gas production from the Site is **negligible**.

5.2. As such, gas control and monitoring are not proposed.

6. Conclusion

6.1. The proposed waste types will be inert (non-biodegradable) in nature and are considered to have a low likelihood of producing gas. The none-to-negligible quantities of gas generated, mean that any gas present is unlikely to be under significant pressure to drive gas off-site (laterally or vertically) and thus removing the likelihood of gas migration.

6.2. The Site will be engineered with a low permeability clay base and side slope, which will further decrease any risk of lateral gas migration. The risk to nearby sensitive receptors associated with the generation and migration of landfill gas is therefore considered to be low.

6.3. Strict Waste Acceptance Procedures will be used to ensure that only non-biodegradable waste is accepted to the Site. Adherence to the Waste Acceptance Procedures will prevent unauthorised wastes being accepted. The absence of biodegradable material within the Site will ensure that gas is not produced and the risk to receptors remains low. Furthermore, this shall ensure that odour nuisance, vegetation stress and global atmospheric damage are also prevented.

6.4. This Gas Risk Assessment has determined that the risk of gas generation and potential for adverse impact on nearby receptors is **negligible**.

Drawings

Drawing No.20/022 001 Permit Boundary Plan

Client: NRS Bromsgrove Aggregates Limited

Title: Permit Boundary Plan

Site:
Sandy Lane Quarry,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worchestershire,
B61 0QT

Date: 30th June 2022

Scale: 1:6000

Reference: 20/022 001

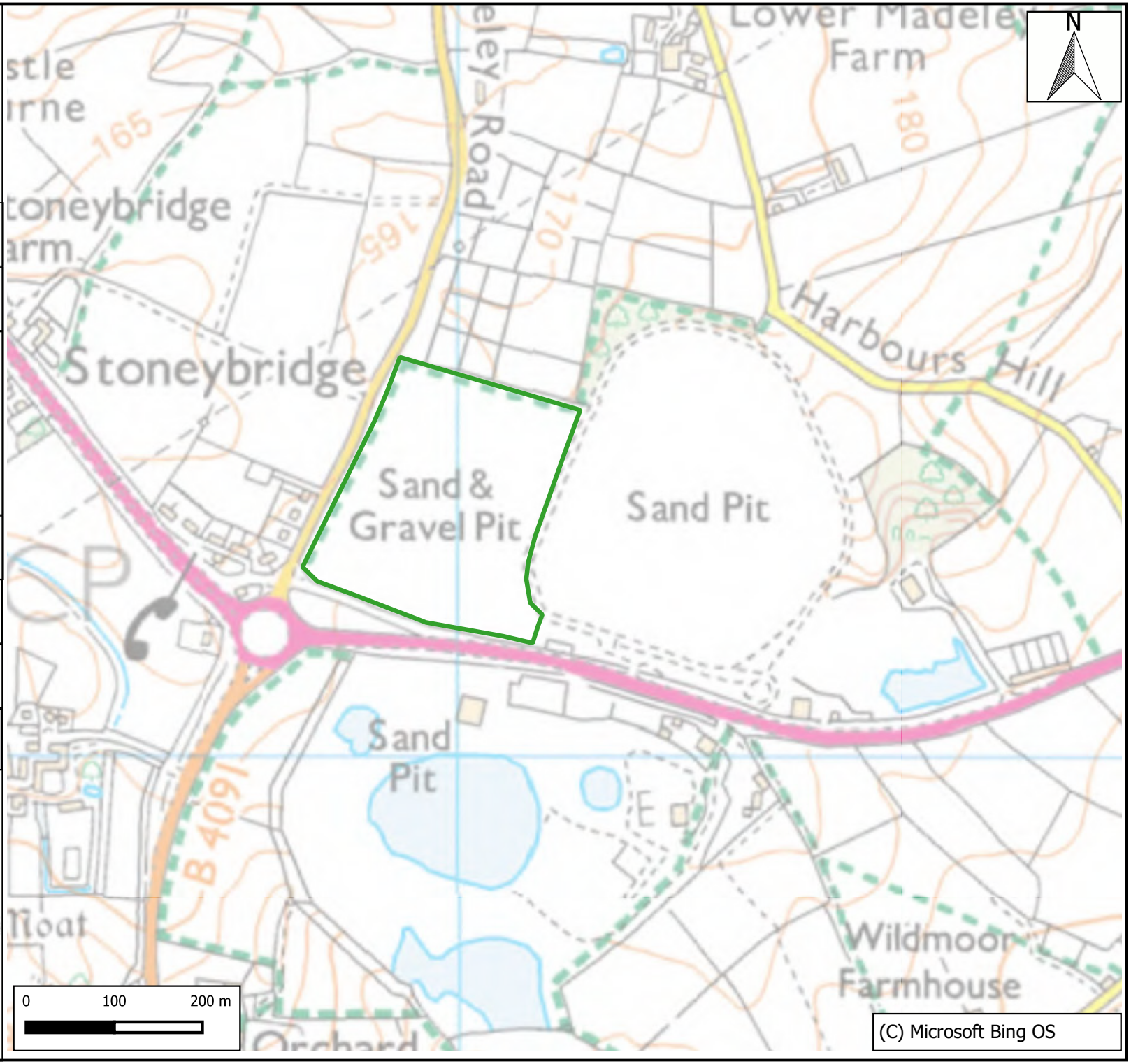
Permit boundary

WESTBURY ENVIRONMENTAL

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk



Appendix 6

Waste Acceptance Procedure

Waste Acceptance

Purpose: To ensure that all waste accepted is permitted under the conditions of the Environmental Permit Sandy Lane Recovery and Recycling.

		RESPONSIBLE PERSON	RECORD
	Environmental Permit and waste codes		
1.	The Environmental Permit contains the list of waste types that are permitted to be accepted at the Site for the disposal and pre-treatment of waste. A table containing the codes and descriptions of waste types that are permitted on this Site is included at the end of this procedure, see Table 1 Permitted Waste Types. This list of waste types shall be consulted if you are unsure whether a load can be accepted, alternatively the Technical and Compliance Team should be consulted. **Please note the Permit will always contain the most up to date list of waste codes acceptable at the Site and should be consulted if in any doubt.**	All	Table 1 Permitted Waste Types Environmental Permit
	Waste Acceptance		
2.	Following a customer enquiry, the Technical and Compliance Team will follow the steps in the 'Pre- Acceptance Flowchart' to determine if further information is required. Such information could include; Site investigation reports/laboratory test reports/Assessments/Photos. EWC code 20 02 02 In regards to this EWC code, waste is generally derived from residential properties that are excavating ground for footings/extensions, driveways, basement digs, garden digs etc. As this EWC code is an absolute non-hazardous waste not testing is required as this waste is seen to be uncontaminated, in order to ensure we only take suitable wastes prior to the company tipping at our facility they are required to sign the document "Waste Pre-Acceptance for Wastes Coded as 20 02 02 Soil and Stones". The main points to this document are: • The waste shall only be loaded from residential properties, parks or cemeteries. • The carrier shall carry out a visual inspection to ensure unsuitable waste is not brought to our facility. • Correct information shall be listed on the waste transfer note.	Sales/Technical	Pre-Acceptance Flowchart
3.	A judgement should be made as to the necessity to obtain comprehensive information at this stage. If the source of the waste is not likely to be contaminated, then it may not be necessary to obtain a full site investigation or laboratory testing under *COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC*. However, in most cases a site investigation report including UKAS/MCERTS testing will be requested to review.	Technical and Compliance Team	

4.	Classification of waste is the responsibility of the waste producer, however, NRS may carry out a technical assessment to highlight any potential hotspots from the site investigation/testing received. • If the Waste is deemed acceptable, the technical team will email the client confirming this and request a Waste Information Form/Season Ticket to be completed and returned prior to bringing in any waste, this information is then checked by the technical team to ensure the waste is correctly described and the EWC is listed on the permit. If it is approved it will then be passed onto the weighbridge whom will create a unique job for that client and site address. • If the waste is acceptable in the main but there are hotspots which are not suitable, the technical team will request a method statement from the waste producer confirming the waste can be/will be kept separate and not come to our facility, in some cases a site visit may be required. Once the technical team have the necessary information the job may be approved. • If the waste is not suitable for whatever reason the client will be emailed to confirm this, the technical team will advise the weighbridge, transport and accounts the job cannot be tipped in order to stop any unsuitable waste being tipped.	Technical and Compliance Team	Waste Classification Procedure
5.	All associated waste information records and waste transfer notes will be kept on record in a secure location. These records will be maintained for a minimum of two years	Technical and Compliance Team	

Acceptance of waste onto the Site

6.	A WTN shall be obtained from the driver and the WTN is checked. A blank WTN may be given to the driver to complete if they do not produce one In some cases, an annual season ticket may be used.	Site Operative	Waste Transfer Note
7.	Loads will be checked to ensure that the load matches the description on the WTN and the EWC code is acceptable under the permit. Acceptable waste types are detailed in and in Table 1 below.	Site Operative	Table 1: Permitted Waste Types
8.	If the load does not match the description on the WTN. The driver may be given the chance to amend the WTN or it may be rejected in accordance with the Waste Rejection Procedure once the Technical Team/Site Manager has been informed.	Site Operative	Waste Rejection Procedure Table 1: Permitted Waste Types
9.	Every load is visually inspected prior to being off loaded. If there is any doubt about the waste type delivered, then a message is relayed to the Technical Team/Site Manager.	Site Operative	Table 1 Permitted Waste Types
10.	After checking the load and the associated paperwork to ensure the job is approved the vehicle is directed where to tip, as we consider the waste hierarchy, loads that can be recycled by way of screening and crushing will be stockpiled and waste that contains too much clay or subsoil it shall be directed to the quarry restoration scheme. A Site Operative on the excavator/dozer shall inspect tipped loads from their cab to ensure there is no gross deleterious waste hidden within the load I.E. Plastics, Wood, Metal, Roots etc. If the dozer operator suspects there to be visual or olfactory contamination they shall inspect the load further, if the waste is not suitable the rejection procedure will be followed.	Site Operative	

11.	If there is a discrepancy with the load or its paperwork, then the Site Manager and Technical Team may be informed if required. If the load has been tipped and is not acceptable under the Environmental Permit, then, if possible, it should be re-loaded onto the vehicle and rejected from Site in accordance with the Waste Rejection Procedure.	Site Operative	Waste Rejection Procedure
12.	If it is impossible to load a rejected load back onto the delivering vehicle the load will be put into the quarantine area and the company shall be contacted to collect the waste. Waste will be rejected from the Site in accordance with the Waste Rejection Procedure.	Site Operative	Waste Rejection Procedure

Compliance Testing

13.	Compliance testing may be carried out on waste accepted on to the Site, the load will be tipped in the quarantine area. Samples taken tested at a laboratory to determine the characteristics of the waste and to ensure that the waste is as described on the WTN.	Site Manager/ Technical and Compliance Team	
14.	For classification compliance testing, an 'Environmental Suite' should be requested from the laboratory for the sample of waste.	Technical and Compliance Team	
15.	A Technical Assessment may be completed using the testing results received from the laboratory. This Technical Assessment will classify the waste as non-hazardous or hazardous.	Technical Team	
16.	If a waste sample is found to be hazardous in nature, then the corresponding waste pile will be quarantined and removed from the Site in accordance with the Waste Rejection Procedure.	Technical Team	Waste Rejection Procedure

Records

17.	A record is kept of all vehicles delivering waste to and from the Site, along with the type, quantity and source of waste delivered.		
18.	Waste Transfer Notes will be appropriately stored for a minimum of two years.		Waste Transfer Note
19.	Information from the Waste Transfer Notes will be used to provide the necessary information to complete the Waste Return as required by the Environmental Permit.		

Waste Acceptance Procedure

Pre-Acceptance Flowchart

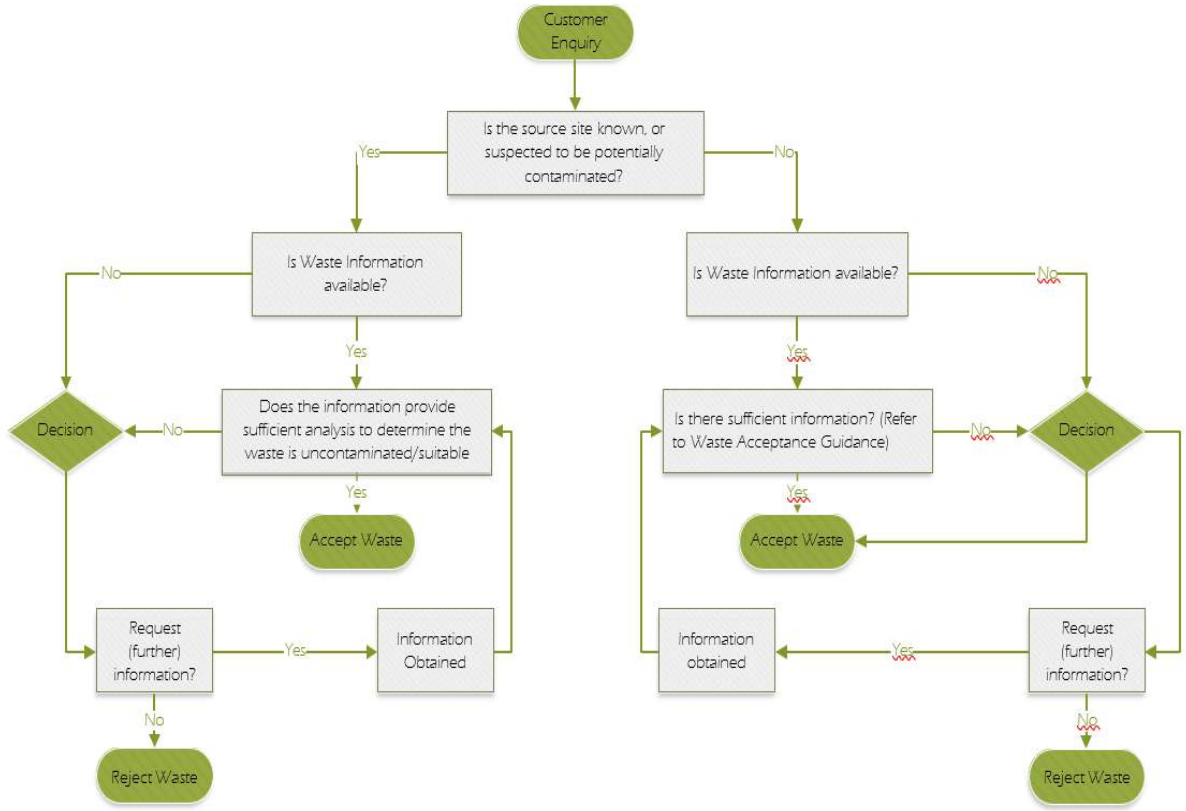


Table 1

Proposed waste types to be used for the production of aggregates

Exclusions
Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders, or loose fibers
- Hazardous wastes
- Wastes in liquid form

Source	Sub-source	Waste code	Description
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06
		01 04 09	Waste sand and clays
02 Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 02 Wastes from preparation and processing of meat, fish and other foods of animal origin.	02 02 02	Shellfish shells from which the soft tissue or flesh has been removed only.
10 Wastes from thermal processes	10 01 Wastes from power stations and other combustion plants	10 01 01	Bottom ash and slag only
		10 01 02	Pulverized fuel ash only
		10 01 15	Bottom ash and slag only from co-incineration other than those mentioned in 10 01 14
	10 11 Wastes from manufacture of glass and glass products	10 11 12	Clean glass other than those mentioned in 10 11 11
	10 12 Wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)
	10 13 wastes from manufacture of cement, lime and plaster products and articles and products made from them	10 13 14	Waste concrete only
15 Waste Packaging	15 01 Packaging	15 01 07	Clean glass only
17 Construction and demolition wastes (including excavated soil from contaminated sites)	17 01 concrete, bricks, tiles and ceramics	17 01 01	Concrete
		17 01 02	Bricks
		17 01 03	Tiles and ceramics
		17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01

Source	Sub-source	Waste code	Description
			06
	17 02 wood, glass and plastic	17 02 02	Clean glass only
	17 03 bituminous mixtures, coal tar and tarred products	17 03 02	Road base and road planings (other than those containing coal tar) only
	17 05 soil (including excavated soil from contaminated sites) stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03
		17 05 06	Dredging spoil other than those mentioned in 17 05 05
		17 05 08	Track ballast other than those mentioned in 17 05 07
	17 09 Other construction and demolition wastes	17 09 04	Mixtures if soil, bricks stones and concrete
19 Wastes from waste management facilities, off site waste water treatment plants, and preparation of water intended for human consumption/industrial waste	19 08 wastes from waste water treatment plants not otherwise specified	19 08 02	Washed sewage grit (waste from desanding) free from sewage contamination only
	19 12 Wastes from the mechanical treatment of wastes	19 12 05	Clean glass only
		19 12 09	Minerals (for example sand, stones)
		19 12 12	IBA plus construction and demolition wastes
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 01 Separately collection fractions	20 01 02	Clean glass only
	20 02	20 02 02	Soils and stones

Proposed waste types to be used for the production of soil and soil substitutes

Exclusions
Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders, or loose fibers
- Hazardous wastes
- Wastes in liquid form

Source	Sub-source	Waste code	Description
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 09	Waste sand and clays

Source	Sub-source	Waste code	Description
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	Bark and cork
	03 03 Wastes from pulp, paper and cardboard production and processing	03 03 01	Bark and wood
10 Wastes from thermal processes	10 01 Wastes from power stations and other combustion plants	10 01 05	Gypsum (solid)
		10 01 07	Gypsum (sludge)
17 Construction and demolition wastes (including excavated soil from contaminated sites)	17 05 soil (including excavated soil from contaminated sites) stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03
		17 05 06	Dredging spoil other than those mentioned in 17 05 05
	17 08 Gypsum-based construction material	17 08 02	Gypsum other than that mentioned in 17 08 01
	17 09 Other construction and demolition wastes	17 09 04	Mixtures of soil, bricks and concrete
19 Wastes from waste management facilities, off site waste water treatment plants, and preparation of water intended for human consumption/industrial waste	19 05 wastes from aerobic treatment of solid waste	19 05 03	Compost from source segregated biodegradable waste only
	19 09 wastes from the preparation of water intended for human consumption or water for industrial use	19 09 02	Sludges from water clarification
	19 12 Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified	19 12 09	Minerals (for example sand, stones)
	19 13 Wastes from soil and groundwater remediation	19 13 02	Solid wastes from soil remediation other than those mentioned in 19 13 01
		19 13 04	Sludges from soil remediation other than those mentioned in 19 13 03
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02 Garden and park wastes (including cemetery waste)	20 02 02	Soils and stones

Proposed waste types to be used in waste deposit for recovery

Exclusions
Wastes having any of the following characteristics shall not be accepted:
- Consisting solely or mainly of dusts, powders, or loose fibers
- Wastes that are in a form which is either sludge or liquid

Source	Sub-source	Waste code	Description	Additional restrictions
01 Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 01 wastes from mineral excavation	01 01 02	Wastes from mineral non- metalliferous excavation	Restricted to waste overburden and inter-burden only.
	01 04 wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06	
		01 04 09	Waste sand and clays	
02 Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 04 wastes from sugar processing	02 04 01	Soil from cleaning and washing beet	Will be limited to placement in the upper 0.5m only
10 Wastes from thermal processes	10 12 wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)	
	10 13 waste from manufacture of cement, lime and plaster and articles and products made from them	10 13 14	Waste concrete	
17 Construction and demolition wastes	17 01 concrete, bricks, tiles and ceramics	17 01 01	Concrete	
		17 01 02	Bricks	
		17 01 03	Tiles and ceramics	
		17 01 07	Mixtures of concrete, bricks, tiles, and ceramics other than those mentioned in 17 01 06	Metal from reinforced concrete must have been removed.
	17 03 bituminous mixtures	17 03 02	Bituminous mixtures other than those mentioned in 17 03 01	Road planings only.
	17 05 soil stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03	Restricted to topsoil, peat, subsoil, and stones only. Topsoil and peat will be restricted to the top 0.5m only.
19 Wastes from waste management facilities	19 12 wastes from the mechanical treatment of waste (for example	19 12 09	Minerals (for example sand, stones) only	Restricted to wastes from treatment of waste aggregates that are otherwise naturally

Source	Sub-source	Waste code	Description	Additional restrictions
	sorting, crushing, compacting, pelletising) not otherwise specified			occurring minerals. Does not include fines from treatment of any non-hazardous waste or gypsum from recovered plasterboard
		19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	Restricted to Crushed bricks, tiles, concrete, and ceramics. Including soils from the mechanical treatment of construction / demolition waste. Metal from reinforced concrete must be removed. Does not include gypsum from recovered plasterboard.
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02 garden and park wastes	20 02 02	Soils and stones	Restricted to topsoil, peat, subsoil and stones only. Topsoil and peat will be limited to placement in the upper 0.5m only.

Procedure: Waste Rejection

Purpose: To ensure non-compliant waste is rejected and that associated records of rejected loads are created.

		RESPONSIBLE PERSON	RECORD
	Reasons for Rejection		
1.	A waste may be non-conforming and rejected from the Site for the following reasons: • Delivery vehicle is unsuitable for Site operations / conditions. • The waste is not acceptable at the Site under the Environmental Permit. • There is prohibited waste within the load. • The load is not accompanied by the correct documentation. • The waste does not match the description on the accompanying documentation. • The waste is unsuitable for treatment/disposal. • The waste contains unsuitable waste. • The job has not been approved. The list is not exhaustive, if you are unsure speak to the Site Manager/Technical Team.	Site Operative/Technical and Compliance Team/Site Manager	Waste Transfer Notes
2.	If a waste is identified as being unacceptable at the Weighbridge or at the point of offloading the Site Manager is contacted and a Waste Rejection Form produced and kept onsite.	Site Operative/Technical and Compliance Team/Site Manager	Form No. 1.3a Waste Rejection
3.	The driver of the load is informed of the load's rejection. The driver will be informed of the reasons for this and requested to leave the Site.	Site Operative/Technical and Compliance Team/Site Manager	
4.	If the load is being rejected because the description of the waste on the transfer note is incorrect, the driver may be given the opportunity to correct the mistake so long as the waste is acceptable at the Site.	Site Manager	
5.	If the load is not safe to be sent back onto the road, then the vehicle is requested to stay in the Quarantine Area until appropriate arrangements can be for its removal.		
	Waste rejected after offloading of the vehicle		
7.	If appropriate, a rejected load should be reloaded onto the delivery vehicle.		
8.	If waste cannot be reloaded onto the delivery vehicle, the waste will be stored in the quarantine area. The customer will be contacted, arrangements to remove the quarantined waste will be made and a copy of the rejection form containing reasons for the rejection will be supplied.		

9.	If arrangements for the customer to remove the waste cannot be made, NRS Group of Companies will make these arrangements themselves. Waste material in the quarantine area will be exported off Site by a licensed waste carrier to an appropriately licensed facility.	Site Manager/Technical and Compliance	
10.	Waste will be stored for a maximum of seven working days in the quarantine area.	Site Manager/Technical and Compliance	
11.	Details of any unauthorised waste and its subsequent removal from Site is recorded and retained on Site.		Form No. 1.3a Waste Rejection

Rejection Form

Waste Transfer Note Number	
Waste Producer and NRS Customer	
Site Address	
Haulier and Vehicle reg	
Time and Date	
Reason	

Name	
Signature	
Date	

50080NRS:ROL:01A

Technical Assesment		NRS Group of Companies	
Customer:		**Tech Person**	
Site Address:		Tonnage / loads:	
		Report Reference	
Contact:		Site History	
Phone:			
Email:			
Total Samples			
Waste description and EWC code		**Proposed Disposal Site**	
Hotspots/Areas to be segregated			
Assessment carried out in line with WM3 where required. Under the COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC certain EWC do not require testing.			
Signed		**Date:**	
Name		**Position:**	

Group of Companies

Group of Companies

NRS WIF/Season Ticket

This form shall be completed fully and signed by the waste carrier/broker and producer of the waste.

The season ticket shall last 1 year from the date of disposal so long as the details below do not change.

TO BE COMPLETED BY WASTE PRODUCER AND/OR WASTE CARRIER/BROKER

General Information

(A1) Waste Producer: Producer Address: Please tick box if person completing the form ☐	(A2) Waste Carrier Company Name: Waste Carrier Address: Waste Carriers Licence: Please tick box if person completing the form ☐
(A3) NRS Customer: Address: Please tick box if person completing the form ☐	
Anticipated Volume of Waste:	Date of Disposal:
Waste Contained and Transported	

tion Required for Waste Characterisation

Full Address of Source of Waste: (Including Postcode)					
Process from which waste arises					
SIC Code for process giving rise to the waste		Type of Waste	Inert ☐	Non-Hazardous ☐	Hazardous ☐
Description and/or composition of Waste (as detailed as possible):					
EWC Code					
Details of Existing and/or Previous Use of Site (if known): (Identify any known previous potentially polluting uses.					
Is waste being generated from a contaminated site?					YES/ NO
Does waste contain any biodegradable material? (e.g. Wood, paper, grass, etc.)					YES/ NO
Has a Site Investigation/Chemical Analyses been carried out and submitted to NRS to review?					YES /NO
Proposed Disposal Site:					

Declaration

I/we confirm that the information given above and the chemical analyses provided with this form are:

a) representative of the material to be disposed of and
b) the analyses were carried out by a MCERT/UKAS accredited laboratory using accredited analytical methods.
c) I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.
d) NIL grass, wood, paper, metal, tyres, general waste, builders waste, any hazardous waste or substances within the loads to be disposed of.
e) Waste must be suitable for treatment or disposal under permit

Producer Name and Signature.....

Carrier/Broker Name and Signature .....

N.B. Any liability incurred by NRS Group of Companies LTD that arises from the provision of false or misleading information on this form will be directed at the Producer of the waste, as it is his/her responsibility to properly characterise the waste.

NRS Approval - Name:	Signature:	Date:
Disposal Site:		

Waste Pre-Acceptance for Wastes Coded as 20 02 02 Soil and Stones.

I confirm that the waste to be tipped at NRS under EWC code 20 02 02 will be soil and stones derived from parks, cemetery waste or residential properties having works carried out such as footings, basement digs, driveways, garden digs etc. The waste mentioned will be visually checked by the carrier to ensure no unsuitable waste is loaded and tipped at NRS Meriden, this would include but not be limited to waste that has an odour, roots, grass, wood, plastic, metal and any other deleterious waste that would not be suitable for treatment or disposal under permit.

Waste transfer notes shall be used for each load and include but not be limited to the following information.

- Description and EWC code – 20 02 02 Soil and Stones,
- The date and full collection address – Must include house number/name.
- SIC code - SIC code means a code included in the UK Standard Industrial Classification of Industrial Activities 2007 (SIC 2007) published by the Office for National Statistics on 14th December 2007.
- Vehicle Registration.
- Driver name and signature.
- Waste Carrier License Number.
- The kind of container used to transport the waste – 8w tipper, 8w grab wagon etc.
- Waste hierarchy declaration - I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011.
- Destined disposal site and permit number

This information will be checked at the gatehouse, if information is missing the driver will be given the chance to amend the transfer note, however in some cases the load may be rejected.

Name .....

Company.....

Signature.....

Date.....

Appendix 7

Dust Management Plan

Dust Management Plan

NRS Bromsgrove Aggregates Limited

Sandy Lane Quarry,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worcestershire,
B61 0QT

WESTBURY ENVIRONMENTAL

PROVIDING SOLUTIONS, ENSURING COMPLIANCE

T 01952 879705 E info@westburyenv.co.uk

A Agriculture House, Southwater Way
Telford, Shropshire, TF3 4NR

W www.westburyenv.co.uk

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Change log

Version	Changes	Produced by	Checked by	Date
1	Original Dust Management Plan	Sian Wilcox	Tracey Westbury	07/03/2025

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Drawings

Drawing No.20/022 002 V2	Sensitive Receptors Plan
Drawing No.20/022 004	Indicative Site Layout Plan
Drawing No.NRS-001-W.D.008	Stage 1 Operations
Drawing No.NRS-001-W.D.009	Stage 2 Operations

Appendices

Appendix No.1	Inspection Checklist
Appendix No.2	Complaints Form

1. Introduction

1.1. Westbury Environmental Limited has prepared this Dust Management plan on behalf of NRS Bromsgrove Aggregates Limited in support of an Environmental Permit application. The permit application seeks to allow treatment of non-hazardous waste to produce soil, soil substitutes and aggregates, and the deposition of materials for recovery.

1.2. The proposed waste activity will be operated at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT (Site).

1.3. The Site extends to an area of approximately 5.5ha. see Drawing No. 20/022 004 Indicative Site Layout Plan. The land-use surrounding the Site is predominantly agricultural land.

1.4. There is an active quarry to the south/ southeast of the Site. Immediately east of the Site is a closed non-hazardous landfill which was formally quarried as part of the same wider site.

Definitions used within this report

1.5. Dust is a generic term for particulate matter and covers airborne particles in the size range of 1 to 75µm (micrometres) in diameter:

- Particles less than 10µm are 'small'
- 10µm to 30µm are termed 'intermediate'
- Particles above 30µm are termed 'large'

1.6. Large and intermediate dust particles are often referred to as nuisance dust, whilst small particles are associated with effects on human health.

1.7. Dust generated from the waste operations undertaken on this Site and the movement of plant and vehicles are commonly of larger particle size.

1.8. The larger particle fraction of dust can create a potential nuisance in the community or impact on the environment. It is normally perceived as an accumulated deposit on surfaces such as window ledges, paintwork, and other horizontal surfaces e.g., car roofs. When the rate of accumulation is sufficiently rapid to cause noticeable fouling, discolouration, or staining (and decreasing time between cleaning) then the dust is generally considered to be a nuisance. The visibility of dust clouds themselves may also give rise to a nuisance.

1.9. The term 'excessively dusty material' is used within this report to refer to material that contains a significant amount of dry fine particles such that when the material is handled it gives rise to dust clouds. Wastes comprising solely or mainly of dusts, powders or loose fibres are not permitted at the Site.

1.10. The term 'excessive', when referring to dust generation, is used to describe a significant dust emission that is anticipated to cause nuisance or adverse impacts to nearby receptors, be visible beyond the Site boundary, and /or reduce visibility in the immediate vicinity of the Site.

1.11. The term 'not effective' in relation to mitigation measures is used to describe the situation when the measure has not had the desired impact on the reduction / minimisation of dust.

Content of the Dust Management Plan

1.12. This Dust Management Plan provides detailed information on the sources, risks and mitigation measures related to the potential of dust emissions from the operations undertaken on the Site. It has been prepared in accordance with Environment Agency guidance "Control and monitor emissions for your environmental permit" last updated 24th November 2022 and the Environment Agency issued template.

1.13. This Dust Management Plan will form part of the Environmental Management System (EMS) for the Site. Procedures and Forms referenced within this Dust Management Plan will be included within the EMS. Completed forms (records) will be kept, as required by conditions included in an Environmental Permit.

1.14. This Dust Management Plan is structured as follows:

- Section 2 provides a summary of the relevant legislation and guidelines.
- Section 3 provides information relating to the Site setting, including the location of the Site and nearby sensitive receptors.
- Section 4 provides a summary of the operations carried out on the Site and the delivery of material to the Site.
- Section 5 provides information on the site management and the mitigation measures employed at the Site.
- Section 6 outlines how decisions to stop operations are made.
- Section 7 outlines how dust emissions are monitored on Site.
- Section 8 outlines the reporting and complaints response process.

2. Relevant Legislation

2.1. The Air Quality Strategy (AQS) for England, Scotland, Wales, and Northern Ireland fulfils the requirement under Part IV of the Environment Act 1995 for a national air quality strategy which sets out policies for improving ambient air quality and keeping these under review. The first strategy, the National Air Quality Strategy (NAQS), was published in March 1997. In January 1999, proposals to amend the strategy were put out for consultation and a consultation document was produced. Following consultation, a revised version of the strategy was published in January 2000. This was further revised in 2007 and has not been revised since this date.

2.2. The AQS provides a framework for air quality control through air quality management and air quality standards and objectives for different pollutants (including particulate matter). These air quality standards and objectives were transposed into English Law by the Air Quality (Standards) Regulations 2010.

Air Quality Management Area (AQMA)

2.3. The system of local air quality management (LAQM) was introduced under the Environment Act 1995. LAQM requires local authorities to periodically review and assess the current and future quality of air in their areas. Where it is determined that an air quality objective is not likely to be met within the relevant time period, the authority must designate an Air Quality Management Area (AQMA).

2.4. The Site is not located within an AQMA. The closest AQMA boundary is 3.4km northeast of the Site. The AQMA is designated by Bromsgrove District Council for Nitrogen dioxide (NO_2).

Low Emission Zone

2.5. A Low Emission Zone (LEZ) is an area that has restrictions on the type and age of vehicles permitted in it, therefore, vehicles emitting high levels of pollution can be prevented from entering and operating within the zone.

2.6. The Site is not located within an LEZ.

3. Site Location and Sensitive Receptors

Site Location

3.1. The Site is located approximately 5km to the north of Bromsgrove and 3km east of Rubery. The centre of the Site is located at National Grid Reference SO 94980 76290.

3.2. The A491, Sandy Lane, runs broadly east-west along the southern boundary of the Site. The Site is accessed from Sandy Lane at National Grid Reference SO 95199 76095.

3.3. The Site extends to approximately 5.5ha, see Drawing No. 20/022 004 Indicative Site Layout Plan.

3.4. Land-use surrounding the Site is predominantly open pasture. However, there is an active quarry, Wildmoor Quarry, located c.25m southeast of the Site.

3.5. Immediately east of the Site is a closed non-hazardous waste landfill. The Site is bound to the west by agricultural land and to the southwest, a small cluster of residential properties.

3.6. Being located within a quarry, the deposit activities will be largely carried out below the surface of the surrounding ground level. Activities carried out at ground level will be of relatively short duration.

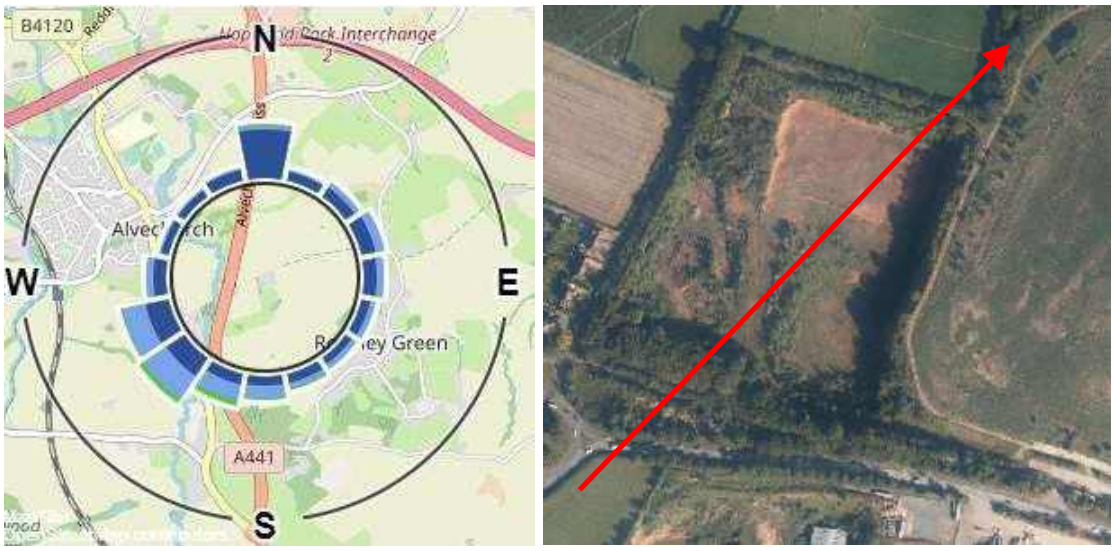
Meteorology

3.7. Unlike many other atmospheric pollutants, the generation of dust is particularly dependent upon weather conditions.

3.8. The prevailing meteorological conditions at any site will be dependent upon many factors, including its location in relation to macroclimatic conditions as well as more site specific, microclimatic conditions. Clearly the most significant meteorological factor is the predominant wind direction and wind speeds, and consequently data has been collected regarding the predominant wind speeds and directions appropriate to the Site.

Figure 3.1: Wind rose - Alvechurch weather station, April 2013 to May 2022

Red arrow shows predominant wind direction



3.9. Wind speed and direction data have been obtained from the Alvechurch weather station for the period from April 2013 to May 2022, see Figure 3.1. Alvechurch weather station is located approximately 9.2km Southeast of the Site. This observing station has wind speed and direction data appropriate for characterisation of the wind climate at the Site.

3.10. The predominant wind blows towards receptors northeast of the Site. Receptors in this direction are predominately open pasture (closed landfill and agricultural land). Some dwellings are present c.400m north east.

Sensitive Receptors

3.11. This Dust Management Plan identifies all types of receptors within 500m of the Site that may be sensitive to dust emissions.

3.12. The distance from the Site boundary to the sensitive receptor plays a key role in the potential impact from dust. The amount of airborne dust tends to reduce significantly further away from the source.

3.13. Due to the nature of the materials being handled on this Site the particle size of the dust emitted is considered likely to comprise of intermediate to large particle size. Therefore, it is considered that particulates from the Site are likely to settle out of the air within approximately 50m of the source.

3.14. Some receptors have a greater sensitivity to dust emissions due to the high risks posed to their operations. Receptors with a higher sensitivity to dust emissions include:

- Food production / preparation services
- Technology industries e.g., nanotech, hard drives/chips.

3.15. The direction and distances from the boundary of the Site to the boundary of sensitive receptors are provided in Table 3.1. The receptors are also shown on the Sensitive Receptors Plan, see Drawing No. 20/022 002.

Table 3.1 Sensitive receptors within 500m of the Site

Ref	Receptor	Description	Direction from site boundary	Distance from site boundary (m)
1	Sandy Lane- A491	Road	South	5
2	Madeley Road	Road	West	10
3	Stone Bridge Estate	Residential	West	20
4	Wildmoor Quarry	Industrial	South	25
5	The Stables residence off Madeley Road	Residential	North	55
6	Accumix Concrete Ltd	Commercial	South	140
7	Harbours Hill	Road	Northeast	265
8	LJ Beauty Clinic	Commercial	North	295
9	Bromsgrove Van Hire	Commercial	Southwest	325
10	Meadowcroft Kennels	Commercial	West	325
11	Residence off Harbours Hill Road	Residential	Northeast	330
12	Deciduous woodland	Deciduous Woodland	East	360
13	Westside Forestry	Commercial	Northeast	385
14	Worlifts	Commercial	East	420
15	Lake	Surface Water Feature	East	420

3.16. There are no highly sensitive industries close to the Site. Receptors downwind of the predominant wind direction are largely open pasture.

3.17. The nearest residential receptor is Stone Bridge Estate (Receptor 3), located 20m west of the Site. There is a significant difference in elevation (c.20m) between these properties and the base of the quarry void, where the majority of the waste deposit activities will occur. The western boundary of the Site is also populated with a thick bank of trees and shrubbery which will act as a screen between the

Site and these residences. The Site propose to erect a 5m high screening bund along the southwestern boundary of the Site with Madeley Road which will further screen the properties from adverse impact.

3.18. The closest receptors to the Site are Sandy Lane Road / A491 and Madeley Road. Sandy Lane (Receptor 1) is used as the main access road into the Site. Thick trees and shrubbery line the eastern and southern boundaries of the Site acting as a barrier between these highways and the Site.

3.19. It is considered that any dust generated by the waste deposit and treatment activities is likely to be deposited within 50-100m the dust generation. As such, it is considered unlikely that dust emissions would adversely impact receptors more than 100m away from the Site.

3.20. The mitigation measures discussed in Section 5 of this Dust Management Plan will minimise the generation of dust and ensure appropriate action is taken.

Other Dust Sources

3.21. Directly opposite the site to the South is an operational sand and gravel quarry (Receptor 4). There is a likelihood that the quarrying operations at Wildmoor Quarry will generate more dust emissions than those from the treatment and deposit of restoration materials on Site.

3.22. Nearby agricultural activities have the potential to generate dust, seasonally.

4. Site operations- Potential dust sources

Overview of Waste Operations

4.1. The operations to be carried out at the Site include the treatment of non-hazardous waste to produce soil, soil substitutes and aggregates for permanent deposit.

4.2. The following have been considered to pose a risk of dust emissions from the Site, particularly in especially hot or dry conditions.

- Material handling and movement
- Any drop of material from a height i.e., loading, unloading of vehicles
- Material storage
- Wind-whipping of material
- Vehicle movements
- Movement of vehicles along paved and unpaved surfaces
- Resuspension of dried mud on surrounding roads as a result of mud from the Site

Site Layout

4.3. The proposed layout of the Site is shown on the Drawing No. 20/022 004 Indicative Site Layout Plan.

4.4. The operator has not yet determined where the waste treatment operations will take place. This Dust Management Plan assumes the worst-case scenario, with waste treatment activities placed near the closest sensitive receptors.

4.5. The Site entrance, weighbridge, parking area and site office are sited on concreted surfacing. The remainder of the Site is hardstanding and to be restored.

4.6. Where appropriate, waste will be deposited directly into the quarry void. The void will be restored in a phased manner. The phasing helps to limit the area over which material is being deposited at any one time, thus reducing the time and area over which dust can be generated.

4.7. Phase 1 involves the importation and placement of material in the creation of a stabilisation buttress along the eastern boundary in the internal void of the site, to provide stability and support for the adjacent landfill site. In addition, material will be placed to restore the ground level in the south-western area of the site and to create a temporary 5m high soil bund to screen receptors in the southwest from noise and dust emissions. The layout of this plan can be seen in Drawing ref. NRS-001-W.D.008 Stage 1 Operations.

4.8. During phase 2 the restoration of the void will continue in a similar manor, placing materials progressively in a north to south direction. Sandy/ acidic soils will either be placed directly onto restored land to achieve a soil profile, or they will be stored in a soil storage bund in the southern area of the site as marked in Drawing No. NRS-001-W.D.009 Stage 2 Operations.

4.9. The northern, western and southern boundaries of the Site are lined with trees and shrubs. The western boundary of the Site abuts the adjacent closed landfill, which is returned to a domed, grassed surface.

Plant and Equipment

4.10. The following plant and equipment are proposed to be used on the Site for the waste operations:

- Loading shovel
- 360^{o} excavators
- Mechanical Grabbers
- Crusher
- Screener

4.11. All plant and equipment used on the Site will be subject to maintenance checks in accordance with the procedures within the EMS.

4.12. All plant will be operated in accordance with industry good practice, for example, operation of a no-idling policy, no-revving of engines etc.

4.13. The Operator will implement a policy of replacing older machinery with new, lower emission machinery as it becomes available and as the business development allows.

Waste Types

4.14. The permitted waste types have been grouped and assigned a "low", "medium," or "high" risk rating based on the potential to create dust emissions, see Table 4.1.

Table 4.1 Dust potential of permitted waste types

Dust potential	Waste type	Waste processes
Low	Soils and sub-soils	Storage, handling, treatment, and depositing
Medium	Sand and clays	
High	Mineral waste	

4.15. Consideration has been given to the mitigation measures to be employed on-site, based on the dust potential of the waste and the processes it will undergo.

4.16. The Operator will take a conservative approach, applying mitigation measures appropriate for the highest risk waste types and processes, to all wastes treated and stored on the Site.

5. Dust Management and Mitigation

Responsibility for implementation of the dust management plan

5.1. The Site Manager is responsible for:

- Implementation of the Dust Management Plan.
- Investigating dust complaints.
- Ceasing activities in the event of a significant dust emission.
- Review and update of the Dust Management Plan.
- Delegation of duties to suitably trained personnel.
- Delivering or organising the necessary training for Site Operatives.
- Ensuring all plant (including dust suppression equipment) on Site is maintained as required.

5.2. Where the Site Manager is unavailable to oversee the implementation of dust suppression measures, a suitably experienced Site Operative is allocated responsibility.

5.3. Site Operatives are responsible for:

- Carrying out routine checks in accordance with the Inspection Checklists, see Appendix 1 Inspection Checklists.
- Ensuring the activities, they are undertaking are not causing significant dust emissions.
- Ensuring any issues relating to dust generation or dust potential are reported to management promptly.

5.4. The Dust Management Plan is reviewed:

- Every four years.
- If a change in operations is considered to potentially increase the risk of dust emissions.
- Following a reported dust incident.

5.5. The review process will amend or update any mitigation measures that have been identified as areas for improvement to prevent dust emissions from the Site.

Training

5.6. All Site Operatives will be given the necessary training to implement the dust suppression measures detailed within this Dust Management Plan.

5.7. Refresher training will be provided to ensure staff remain competent in the following instances:

- Following implementation of new dust suppression measures.
- Following identification of procedures not being followed.

5.8. This training is delivered or arranged by the Site Manager.

Dust Control

<u>Overview</u>

5.9. This report identifies the potential sources of dust on the Site and the mitigation measures (preventative and remedial) that will be implemented to break the source-pathway-receptor routes for dust.

5.10. Preventative measures will be implemented to minimise the risk of dust being generated due to activities on Site. The preventative measures address dust generation at the source.

5.11. The effectiveness of these preventative measures will be assessed during visual monitoring by Site Operatives. Visual monitoring will be both, set daily inspections from identified set monitoring locations and continuous while undertaking waste operations on Site.

5.12. Preventative measures have been not sufficiently effective if visual monitoring identifies activities on Site are generating dust that has the potential to cross the boundary.

5.13. Appropriate remedial measures in Table 5.2 will be implemented if the preventative measure has been ineffective.

Sources and Control of Emissions

5.14. Table 5.1 details the potential sources of dust on the Site and which mitigation measures are implemented to break the source-pathway-receptor routes for dust emissions.

5.15. Table 5.2 lists the preventative measures implemented to prevent dust generation from activities on Site including details of when and which mitigation measure will be implemented.

5.16. Table 5.2 also provides remedial measures to be implemented if preventative measures are considered to be not sufficiently effective or are likely to be not effective.

.

Table 5.1: Source pathway receptor routes

Source	Pathways	Receptor	Type of Impact	Where relationship can be interrupted
Mud	Transportation of dust from mud on wheels and vehicles	Sandy Lane Road (A491).	Mud on the Site and local roads. Resuspension of mud as airborne particles.	Remove source of mud by: - Use of wheel washing facilities on vehicles entering and exiting the Site. - Sheeting of incoming waste vehicles. - Deployment of a road sweeper Regular cleaning of site/spills in accordance with EMS.
Vehicle / Plant movements	Atmospheric dispersion	Neighbouring residential properties, roads, and commercial buildings.	Visual soiling and dust emissions.	Minimise source of dust by: - Implementing a 5mph speed limit - Implementing a 'no-idling' policy - Sheeting of incoming waste vehicles - Limiting the double-handling of material - Dampening surfaces to limit resuspension of dust. - Regular cleaning of site/spills in accordance with EMS. Remove source by: - Ceasing vehicle movement until remedial measures are implemented.
Tipping, treatment, and storage of materials in the open	Atmospheric dispersion	Neighbouring residential properties, roads, and commercial buildings.	Visual soiling and dust emissions.	Interrupt pathway for emission by: - Use of the minimum drop heights. - Storing waste in bays with 1m freeboard to prevent entrainment of dust by wind. - Use of mist sprays on known dust-generating activities as standard - Increase use of water sprays on stored waste. Remove source by: - Ceasing waste deposit activities until remedial measures are implemented.
Conveyor belts	Atmospheric dispersion of dust produced by movement of materials within equipment	Surrounding sensitive receptors	Airborne particulates and build of dust.	The conveyor operates outdoors. Coverage with dust netting can be employed where necessary.

All Site operations	Atmospheric dispersion	Neighbouring residential properties, roads, and commercial buildings.
		Nearby surface water features.
			Visual soiling and dust emissions.	Remove source by:
				- Implementation of above preventative measures.
				- Reject wastes consisting solely or mainly of dusts or loose fibres.
				- Ceasing activities until remedial measures are implemented.
				
				Interrupt pathway with:
				- Boundary screening:
				  - Thick tree/hedge line along the northern, southern and eastern boundaries of the Site.
				  - 5m screening bund in southwest corner of the Site.
				- Elevation – waste deposit activities will predominately take place within the quarry void, at lower elevation than surrounding ground level (up to 20m).

Table 5.2: Mitigation Measures

Measure	Description / effect	Use on site	Trigger for Implementation	How it is implemented	Remedial measure to be implemented if preventative measure not effective
Preventative measures					
Site speed limit, "no idling" policy and minimisation of vehicle movements on the Site.	All vehicle movements have potential to generate dust from wheel movement over site surfaces in dry conditions.	All staff will be aware of company policy of: - 5mph speed limit. - No-idling. - minimisation of vehicle movements. - Limit material double handling.	Any vehicle operation.	Staff training. Site signage. Implementation of Dust Management Plan and EMS procedures. Good planning and communication around waste deposit and storage to limit double handling. Enforcement by Site Manager and observation by Site Operatives.	Refresher training/ enforcement. Road sweeping Dust suppression on Site surfaces. Cease operations.
Sheeting of vehicles.	Reduces the risk of debris and dust escaping incoming loads.	All vehicles entering / exiting the Site will be sheeted. Loads comprising solely of dusts or loose fibres will not be accepted.	All vehicles carrying waste to/from the Site will be sheeted unless being loaded or unloaded.	All vehicles will be inspected at the weighbridge to ensure they are sheeted. Un-sheeted vehicles will be instructed to sheet or be denied entry/exit.	Dust suppression of waste prior to loading/ unloading. Cease operations.
Minimising drop heights for material.	Ensuring materials are not dropping from excessive heights allowing: - Material entrained by winds / transported larger distances. - Creation of dust from impact with the ground.	Minimise drop heights. Plant operatives lowering the grabs, shovels, conveyors on equipment being used to move potentially dusty materials.	All times, during. - Material movement, deposit.	Staff training. Good planning and communication around the importance of minimising waste deposit drop heights. Enforcement by Site Manager and observation by Site Operatives.	Water sprays on: - incoming material - material being moved. Cease operations.
Minimising stockpile heights.	Prevents wind-whipping of stored waste.	Maintain 1m freeboard in waste bays/ adjacent screening wall/bund / quarry wall.	At all times when waste is being stored.	Staff training.	Spraying water onto stockpiled waste.

Measure	Description / effect	Use on site	Trigger for Implementation	How it is implemented	Remedial measure to be implemented if preventative measure not effective
				Implemented via Waste Storage and Handling Procedure in EMS. Waste storage areas will be checked regularly as part of the Inspection Checklist.	Covering of waste/ removal from Site.
Dust suppression (water sprays misting).	Using water on waste and site surfaces to prevent dust becoming airborne.	Employment of the following dust suppression measures to wet waste and site surfaces: - Bowsers. - Water sprays connected to bowsers. - Integral spray bars fitted on the crusher. Site layout allows easy access for suppression equipment access and application.	Water suppression will be used: - If identified to be necessary (see Table 6.2 for assessment of regular site activities). - If significant dust emissions are observed from waste or surfaces.	Staff training in use and maintenance of plant. Inspection Checklists ensure: - Regular inspection of suppression equipment for defects/maintenance. - Sufficient water for dust suppression per the Inspection Checklists.	Additional water suppression. Cease operations.
Wheel cleaning.	Prevents mud being tracked into or out of the Site which could be resuspended as dust.	Use of wheel washing facilities at the site entrance to remove mud from the wheels of vehicles.	Undertaken before vehicles exit the site, or if visible dust clouds are generated from the movement of vehicles	Staff training in importance of preventing mud entering and leaving the Site. Vehicles entering/ exiting the Site will be inspected to ensure their wheels are free of debris prior to being admitted entry/ exit.	Refresher training/ enforcement. Road sweeping of site surfaces and Sandy Lane. Cease operations.
Road sweeper.	Removes mud and dust from road surfaces as a potential source of resuspended dust.	Deployment of a road sweeper.	Carried out as part of sites regular housekeeping, see Inspection Checklists. Following dust generation from Site surfaces which leads to dust emissions.	Implementation of the Inspection Checklists.	Water sprays on roads. Increase use of sweeper. Cease operations until roads are in a clean state.
Screening Features	Screening features interrupt the pathway between the Site activities and nearby receptors.	Receptors will be screened from operations on site by the following:	N/A	N/A	Use of water sprays to dampen surfaces and stockpiles.

Measure	Description / effect	Use on site	Trigger for Implementation	How it is implemented	Remedial measure to be implemented if preventative measure not effective
		- Thick tree/hedge on northern, southern, and eastern Site boundaries. - 5m high screening bund in the south-eastern corner of the site. - The elevation difference between the sensitive receptors and majority of the waste deposit activity within the quarry void.			Cease activities.
Good Housekeeping	Employing a consistent, regular housekeeping regime that is supported by management, ensures that issues will be addressed proactively and promptly to prevent and remove dust build up.	The Site operates in accordance with an Environmental Management System (EMS). The EMS employs a Housekeeping Procedure which implements the preventative dust measures within this Dust Management Plan.	At all times by employees while the site is operational.	Implementation of the Inspection Checklists and Housekeeping Procedure. Enforcement by Site Manager and observation by Site Operatives.	All above. Refresher training/ enforcement. Cease operations.
Remedial Measures					
Refresher training / enforcement	Provision of additional/refresher training or rule enforcement to Site Operatives to ensure existing preventative measures are followed.	Implement additional training. Implement refresher training. Implement measures to enforce preventative measures.	Following identification of a significant dust emission where the preventative measure was not adequately employed.	Training/ enforcement as required following investigation of a significant dust emission event.	N/A
Additional water sprays and misters	Using additional delivery method of water to waste or Site surfaces to prevent dust becoming airborne.	Employment of the following dust suppression measures to wet waste and site surfaces: - Water sprays connected to bowsers - Bowsers - Water additive which further helps prevent emissions.	Additional water suppression will be used: - If identified to be necessary (see Table 6.2 for assessment of regular site activities). - If significant dust emissions are	Deployment of necessary suppression plant to waste deposit / storage areas requiring additional suppression. Deployment of additional water suppression to waste or surfaces as required.	Cease activity causing the dust emission.

Measure	Description / effect	Use on site	Trigger for Implementation	How it is implemented	Remedial measure to be implemented if preventative measure not effective
			observed from waste or surfaces.		
Ceasing Operations	Remove the risk of dust emissions by stopping Site operations.	Ceasing waste deposit and treatment activities. Removal of offending waste from Site.	The occurrence of significant, uncontrollable dust emissions.	See Section 6, Cessation of operations for dust mitigation.	Use of water sprays and misters

Other Considerations

Water Availability

5.17. Mains water supply is available on Site which will supply the Site office, wheel wash and an outlet for filling bowsers or water sprays.

Drought

5.18. During exceptionally dry and/or windy conditions, if any waste storage, treatment or deposit activities cause or are likely to cause visible dust emissions beyond the Site boundary, or if significant dust emissions are observed within the Site, operations may be suspended to avoid further dust emissions. This will be decided by the Site Manager.

5.19. Wind speed is not actively measured on site therefore it is the role of the site manager to use relevant visual observations and weather forecasts to decide when operations should cease.

5.20. Depending on the severity of the drought conditions, restrictions may be in place on the amount of water available for use on Site from the supplier (mains water supply). In this case, operations may be reduced or suspended in order to comply with any water usage restrictions.

Pump breakdown

5.21. The dust suppression units and water sprays will be powered by hired pumps.

5.22. Activities requiring pumped water sprays will not take place **if** the requisite water suppression is not available through pump breakdown/ no availability.

6. Cessation of operations for dust mitigation

6.1. The following section details the assessment process to be taken when determining if and which activities on Site should stop to prevent significant dust emissions.

Estimating Magnitude of Risk

6.2. Table 6.1 provides a matrix for estimating the magnitude of risk from a potential hazard, considering both the probability and consequences of the hazard occurring.

6.3. The magnitude of risk determines the level of management required to reduce the probability of the hazard occurring.

6.4. In this management plan, the hazard is the significant emission of dust from the Site.

Table 6.1 Estimating the magnitude of risk

	Magnitude of Risk	Consequence			
		High	Medium	Low	Negligible
Probability	High	Very high	High	Medium/Low	Very low
	Medium	High	Medium	Low	Very low
	Low	High/Medium	Medium/Low	Low	Very low
	Negligible	High/Medium/Low	Medium/Low	Low	Negligible

6.5. An assessment of the scenarios which could lead to significant dust emissions from the Site has been undertaken and is presented in Table 6.2.

Table 6.2: Risk Matrix for the ceasing of operations

Conditions	Probability	Consequence	Risk magnitude
Risk from waste deposit and storage activities			
Dry, cool weather (<20deg)	Medium	Low	Low
Dry, hot weather (>20deg)	Medium	Medium	Medium
Dry, windy weather (>4 Beaufort)	Low	Medium	Medium/low
Dry, still winds (<3 Beaufort)	High	Negligible	Very low
Gale-force winds	Low	Medium	Medium/low
Plant failure or breakdown (water suppression)	Low	Medium	Medium/low
Preventative and remedial measures not effective	Medium	High	High

6.6. The action required per Risk Magnitude rating (Low/Medium/High) is provided in Table 6.3.

Table 6.3 Action required per risk magnitude rating

Risk Magnitude	Action
Low	Continued implementation of preventative measures.
Medium	Dust emissions are likely. Relevant activities* **stop** until additional remedial measures are implemented. Relevant waste activity may temporarily cease - can resume upon implementation of additional mitigation if remedial measure is effective. Relevant waste activity must **stop** if significant dust emissions are observed. Relevant waste activity can resume when the conditions no longer apply/ additional remedial measure is implemented and there are no significant dust emissions.

High	Relevant waste activity will **stop**. In the case of waste storage this will mean either removal or covering of the offending waste within 1 day if remedial measure is not effective. Relevant waste activity can resume when the conditions no longer apply/ additional remedial measure is effectively implemented and there are no significant dust emissions.

**Relevant activities: Activities identified as generating significant dust emissions or having the potential to generate significant dust emissions in such conditions.*

Dynamic Risk Assessment

6.7. Any scenario for which the Magnitude of Risk has not already been assessed for in Table 6.2 can be undertaken by completion of a dynamic risk assessment using the Risk Matrix in Table 6.1.

6.8. The dynamic risk assessment will be completed by the Site Manager and recorded. If the scenario is likely to recur, it will be added to the Dust Management Plan at the earliest opportunity.

7. Monitoring

Weather Monitoring

7.1. Wind speeds and temperature are not electronically measured on Site. Weather conditions will be recorded on the Daily Inspection Checklist from observations made.

7.2. Wind speed will be estimated using one of the following methods:

- An estimation using the Beaufort scale.
- Using local wind speed information from a weather monitoring website.
- A calibrated windsock.

7.3. Adverse weather conditions are considered to be:

- Windy conditions (>4 Beaufort scale)
- Prolonged dry and hot (>20 degrees and dry surface conditions from lack of rainfall) conditions.

7.4. The weather will be considered by the Site Manager when planning the activities for the day to ensure appropriate activities will be carried out to, minimise dust generation where possible.

Visual Dust Monitoring

7.5. Dust emissions at the Site will be monitored by visual observation.

7.6. Monitoring of dust emissions will take place at 3 fixed dust monitoring locations across the Site as part of the daily inspections. The location of the fixed monitoring locations are shown on Drawing No. 20/022 004 Indicative Site Layout Plan.

7.7. A record of the monitoring and the results will be recorded on the Daily Inspection Checklists, see Appendix 1 Inspection Checklists.

7.8. In addition, Site Operatives will undertake visual monitoring as they undertake their usual duties. Any identification of dust emissions or concern will be reported to the Site Manager promptly. Further mitigation measures will be implemented if required.

7.9. If significant dust emissions are observed, the actions in the Emission Response will be followed, see Section 8.

8. Reporting and Complaints Response

Community Engagement

8.1. A Site Notice Board will be located at the Site entrance.

8.2. The Site Notice Board will include the following information:

- The Permit holder's name.
- An emergency contact name and telephone number.
- A statement that the Site is permitted by the Environment Agency
- The Environmental Permit Reference.
- The Environment Agency national numbers, 03708 506506 and 0800 807060 (incident hotline).

8.3. The provision of the above information will ensure that members of the community can contact the Operator should they be concerned by dust emissions or wish to make a complaint. This also applies to any events that may happen when the Site is unmanned / not operational.

Complaints Reporting / Response

8.4. Following receipt of a complaint (either directly to emergency contact or via the regulator), the complaint will be recorded on the Complaints Form. A copy of the Complaints Form can be found in Appendix 2.

8.5. The Complaints Form records:

- who made the complaint,
- what the complaint was about and
- what has been done to resolve the issue and make sure this does not happen again.

8.6. In the event of a complaint being received, staff will follow the Emission Response procedure. The Complaints Procedure in the Site's EMS will implement the detail.

8.7. If the emission is deemed not to be coming from the Site, the Site Manager will contact the complainant to communicate the reasons for this and ensure they are satisfied.

8.8. The receipt of multiple complaints may help the Site Manager to identify the possible source more quickly i.e., origin of the complaints may indicate if the source is diffuse or localised. The Emission Response will be followed.

<u>Emission incident / complaint response</u>

8.9. Upon detection of a significant dust emission or receipt of a complaint regarding dust nuisance, the following actions will be taken:

- Inspection of the reported location of the emission.
- If a dust emission is identified, then remedial measures will be actioned in accordance with the details in Table 5.2.
- If no dust emission is identified, then the investigation will focus on what the activities were at the time that the dust emission was reported, to determine if the Site was the source of the emission.
- If the investigation reveals an on-going cause of an emission, then that activity will cease if remedial measures cannot stop the emission.
- Activities can resume if appropriate remedial measures are implemented to prevent any further dust emission.
- An incident / complaint report form will be completed in accordance with the requirements of the EMS.

8.10. In addition to the above, the following actions will be taken following an incident that caused of a significant dust emission from the Site:

- The Environment Agency will be notified in accordance with the notification form in the permit.

- The complainant(s) (if any) will be notified promptly to inform the complaint is being investigated and estimated timescales for an update/remedy.
- Record the reason and action to prevent recurrence.
- Consider if the Dust Management Plan requires updating.
- Update Dust Management Plan (if required).

8.11. If the emission is as a result of a procedure not being implemented properly, then staff will receive repeat EMS training on the dust procedures and site management.

8.12. If the emission is as a result of plant failure, the plant will be repaired/ serviced or provided with additional suppression before that operation can resume.

Drawings

Drawing No.20/022 002 V2	Sensitive Receptors Plan
Drawing No.20/022 004	Indicative Site Layout Plan
Drawing No.NRS-001-W.D.008	Stage 1 Operations Drawing
No.NRS-001-W.D.009	Stage 2 Operations

Appendix 1

Inspection Checklists

Item for Visual Inspection	**Aspects for Inspection**	**Checked Y/N**	**Remedial Action Required** (Y/N, describe)
Weather	Absence of adverse weather conditions -wind >Beaufort scale 4 -prolonged dry and hot (20 deg) weather. (if not, what additional dust mitigation is needed for activities to continue)		
Mud and Debris	Site surfaces clear of mud		
	Public highway clear of mud		
Plant/Equipment	Pre-use checks completed		
Litter	None present in waste storage areas		
	None present in waste processing area		
	None present along site boundaries (fencing etc.)		
Odour	No odorous waste on Site		
Dust	No significant dust emissions at monitoring points.		
	No significant dust emissions are escaping the boundary of the site		
	Water supply dust suppression is adequate		
Fuel oil storage	Fuel tank checked for any sign of damage, corrosion, deterioration, incident, leakage, or spillage.		
Fugitive emissions to water	No visible contamination in runoff water i.e. no oily sheen visible.		
	No leaks from containers or the quarantine area that could cause contamination in runoff water.		

Date: _____ Completed by: _____ Signature: _____

Item for Visual Inspection	**Aspects for Inspection**	**Checked Y/N**	**Remedial Action Required** (Y/N, describe)
Oil storage	Storage secure (i.e. locks operational)		
	No evidence of oil storage leakage.		
	Oil storage container is free from damage, corrosion, deterioration, incident, leakage, or spillage.		
Site Security	Fencing around site perimeter in good condition – no holes etc.		
	Lock on gated entrance working and no signs of corrosion		
Site surfaces	Clear, swept and free from damage, defects, or ruts.		
Pests and vermin	No activity or damage caused by pests/ vermin e.g. holes in fencing, chewed cables.		
Drainage	Drains are clear of debris, odour and are draining sufficiently.		

Date: _____ Completed by: _____ Signature: _____

Item for Visual Inspection	**Aspects for Inspection**	**Checked Y/N**	**Remedial Action Required** (Y/N, describe)
Impermeable surfacing	Surfaces free from cracks which may allow water to reach the ground below.		
Containers	Containers free from cracks which may result in loss of containment.		
Fuel tank	Integrity of the fuel tanks – there should be no cracks or leaks.		
Drains	Drains are free from blockages		
Electrics	Wires are not frayed / damaged.		
	Sockets are not overloaded.		
Waste storage	Waste storage containers have no holes or leakage.		
	No damage, corrosion, deterioration, of waste storage areas.		

Date: _____ Completed by: _____ Signature: _____

Item for Visual Inspection	**Aspects for Inspection**	**Checked Y/N**	**Remedial Action Required** (Y/N, describe)
Electrics	Electrics to be inspected and certified by a qualified electrician.		
Fire extinguishers within vehicles	Fire extinguishers are serviceable.		
All site plant:	Service completed (if required) No leaks or cracks requiring repair Full working order		

Date: _____ Completed by: _____ Signature: _____

Appendix 2

Complaints Form

Incident / Complaints Form **V.1 October 2022**

Who made the complaint? Name:	
Address:	
Phone No.:	
Date and time they made the complaint:	
What happened? What was it about?	
Was anyone else aware of this – other neighbours or your staff? If so, who?	
Did the complaint relate to your site? If so, what happened? What went wrong?	
What have you done to make sure that it does not happen again?	
Was there any significant pollution – for example: dust, odour or noise outside the site or spillage of polluting liquids onto the ground, into a drain or a watercourse?	
If there was, then you must notify the Environment Agency on 0800 807060 and any other relevant regulators. Have you done so? Yes ☐ No ☐	At what time did you phone?
You must also write or send an email to confirm this to your local Environment Agency office. Have you done so? Yes ☐ No ☐	What date did you contact?
Please print and sign your name:	

Appendix 8

Environmental Setting & Site Design Report

Please note that this ESSD report has not been updated since the last submission of this application. However, as required, further environmental monitoring data has been obtained. All the available monitoring data has been included in the Appendix of the ESSD. The table of groundwater monitoring data in section 3.3.2 of the ESSD has not been updated. It is considered that the new data does not significantly change the summary information in the Table.

hafrenwater
environmental water management

ENVIRONMENTAL SETTING AND SITE DESIGN REPORT

SANDY LANE QUARRY

Report Reference: 3308/ESSD
Final version F2
June 2024

Report prepared for:

NRS Bromsgrove Aggregates Limited
NRS House - Site 7
Meriden Park
Cornets End Lane
MERIDEN
Warwickshire
CV7 7LG

Barkers Chambers • Barker Street • Shrewsbury • United Kingdom • SY1 1SB
T: 01743 355770 • *F*: 01743 357771 • *E*: info@hafrenwater.com

GENERAL NOTES

Title of report: Environmental Setting and Site Design Report

Site: Sandy Lane Quarry

Report ref: 3308/ESSD

Date: June 2024

Version	Date	Issued to
Draft version D1	July 2022	Westbury Environmental Ltd
Final Version F1	August 2022	Westbury Environmental Ltd
Final Version 21	June 2024	Westbury Environmental Ltd

Author: Heather MacLeod BSc MSc FGS

Reviewer: Lawrence Brown BSc MSc CGeol

https://hafrenw.sharepoint.com/sites/HafrenWater/Shared Documents/General/Projects/Sandy Lane Quarry (3084)/2022_Permit application/Reports/ESSD/3308-ESSD vn F2 (Jun 24).docx

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1 INTRODUCTION

1.1 Report context

The site at Sandy Lane, Bromsgrove, Worcestershire (the 'site') comprises a former sand quarry owned by NRS Bromsgrove Aggregates Limited (NRS). The Sandy Lane complex comprises three main areas: in the centre is a completed Veolia Landfill, to the east former silt settlement lagoons and in the west a disused quarry void. This application concerns the western quarry void only.

It is proposed to remove final sand reserves, provide buttress support to the eastern quarry face and restore the remainder of the site using inert fill back to approximately pre-quarrying ground levels. The proposed after-use for the site comprises creation of wildlife habitat.

The proposed stabilisation of the failing eastern quarry face (western sidewall of the Veolia Landfill) will comprise the construction of a foundation buttress using selected fill. Extraction of 245,000 tonnes of sand will also be undertaken together with the importation of 975,000 m^3 of inert fill.

Hafren Water has been requested to prepare the Environmental Setting and Site Design (ESSD) report, which sets out the background and baseline conditions in support of the Permit Application. The format of this ESSD report is based upon the Environment Agency on-line guidance entitled 'What to include in your environmental setting and site design report", April 2021 and "Plan the environmental setting of your site" dated 30th January 2020, updated 17th February 2022.

This version F2 of the report has been generated to take into account the construction of site-specific boreholes and comments from the Environment Agency dated 9th May 2024.

1.2 Site details and context

1.2.1 Site location

The site is located adjacent to the junction between the A491 and B4091 (Madeley Road) approximately 2 km west of Junction 4 of the M5 at National Grid Reference (NGR) SO 94980 76290. The location of the site is shown on *Drawing 3308/ESSD/01*. Access to the site is via the main Veolia Landfill site off the A491, Sandy Lane, to the southeast of the site.

1.2.2 Site classification

This document is the Environmental Setting and Site Design (ESSD) that accompanies the application by NRS for a bespoke permit to allow deposit of waste for recovery at Sandy Lane Quarry, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QT. A waste recovery plan

for the site (Westbury Environmental, August 2021) has been submitted to the Environment Agency. The permit application is being prepared by Westbury Environmental Ltd.

1.2.3 Application boundary

The site layout and proposed direction of working is shown on *Drawing 3308/ESSD/02*. The proposed permit boundary covers the remaining worked out area west of the Veolia Landfill. It totals approximately 5.5 hectares (ha). Sandy Lane parallels the southern boundary of the site and land to the north of the site comprises grazing pasture. A footpath lies between Madeley Road and the western boundary of the site and between the northern boundary and the adjacent pasture.

1.2.4 Landform

The site lies just to the west of a northeast-southwest trending interfluve, separating the valleys of the Fenn Brook to the northwest, Battlefield Brook to the southeast and Hockley Brook to the west. The elevation of the interfluve declines from over 260 metres Above Ordnance Datum (mAOD) 2.5 km to the northeast of the site to around 175 mAOD just to the southwest. The topography declines to approximately 140 mAOD at Battlefield Brook and 150 mAOD at Fenn Brook.

In the immediate vicinity of the site, the original topography has been altered, firstly by the quarrying activities and subsequently by restoration using landfilling. Immediately to the east is the restored Veolia Landfill site in which the restoration contours form a domed feature rising to just over 194 mAOD. To the south is the A491, Sandy Lane, beyond which is an active sand quarry (Wildmoor Quarry) within which elevations vary between 160 and 147 mAOD (based on LiDAR 2022). To the west, the boundary is defined by Madeley Road, beyond which is agricultural land and a group of 10 to 15 houses ('Stonebridge'). To the north the site is bounded by agricultural land with elevations rising from 167 mAOD in the west to 176 mAOD in the east.

Within the site, the elevation of the base of the void, at its deepest point, is 150 mAOD based on the topographical survey.

1.2.5 Surrounding land use

The environmental site setting is shown on *Drawing 3308/ESSD/03*.

Land to the north remains as grazing land whereas land to the east has been subject to quarrying and later restoration using non-hazardous waste. Beyond the A491, Sandy Lane, land now comprises the Wildmoor Quarry, which is an active quarry extracting sand from the Wildmoor Formation.

The nearest residential properties are on Madeley Road approximately 30 m west of the site boundary.

1.2.6 Summary of land use

A summary of the current and historical land use in a 500 m proximity to the proposed permit boundary is provided in *Table 3308/ESSD/T1* below. The environmental setting of the site is shown on *Drawing 3308/ESSD/03*.

3308/ESSD/T1: Summary of land uses within 500 m of Permit boundary	
Land use	**Distance/direction from site**
Residential properties:	
Properties off Madeley Road	20 m W
Properties off Madeley Road	293 m NNW
Properties off Sandy Lane	550 m NE
Listed Buildings:	
The Old Toll House	75 m SW
Lower Madeley Farm	424 m NNE
Fairfield Court	370 m SW
Recreation areas:	
Rough ground used as BMX track	20 m SW
Other amenity sites:	
No schools or places of worship within 500 m	
Agricultural land:	
Immediately north	
West of Madeley Road	
East of Veolia Landfill	
Southwest of Sandy Lane	
Conservation:	
Ecological & environmental conservation sites	None
Utilities:	
Gas pipeline	None
Electricity cables	None

2 SOURCE

2.1 Historical activities on-site

The site was historically used as farm land prior to quarrying commencing in the 1920's. The quarry is now operated under a Review of Old Mineral Planning Permissions (ROMP) dated 20th March 2000. However, it is currently dormant, and wildlife has been allowed to colonise. The base of the site, the quarry floor, is above the surrounding watertable and no dewatering has been undertaken at the site.

Within the wider Sandy Lane site, the far eastern quarry void was used for silt settlement to treat discharges from the mineral processing and wash plant. This area currently comprises a waterbody in the southeast and scrub/woodland vegetation elsewhere.

The central area has been landfilled by Veolia, restoring the site to a domed profile with maximum elevations of 194 mAOD in the centre. The site was lined commensurate to modern day standards and it received non-hazardous waste.

2.1.1 Historical landfill sites

Environment Agency data indicates that there are fifteen historical landfill sites within 2 km of the site boundary. The sites are shown on *Drawing 3308/ESSD/04*.

Three of these landfill sites are immediately adjacent to the site. Two are within the same former sand quarry void, Stanley Evans Sand Quarry and Harbours Hill. The third site, Cinetic Sands, is within the active Wildmoor Quarry on the south side of the A491. Details of these sites are recorded in *Table 3308/ESSD/T2*.

3308/ESSD/T2: Historical landfill sites

Map ID	Site name	WRC N°	Licence holder	Last input	Waste
HL1	Stanley N Evans Sand Quarry	1800/0043	Cleanaway Limited		I, C, H, S
HL2	Harbours Hill	1800/0060	Cleanaway Limited	30/09/1985	In, I, C, H
HL3	Cinetic Sands	1800/0074	John Williams Cinetic Sands Limited	12/09/1990	In, I, S, L

In – Inert I – Industrial C – Commercial H – Household S – Special L - Liquid sludge

2.1.3 Permitted landfill sites

According to Environment Agency data, three permitted (active) landfill sites are located within 2 km of the site boundary, as indicated on *Drawing 3308/ESSD/04* and summary information provided in *Table 3308/ESSD/T3*.

3308/ESSD/T3: Active landfill sites				
Map ID	**Site name**	**Licence N°**	**Licence holder**	**Status**
PL1	Sandy Lane Landfill Site	XP3233QT	Veolia ES Landfill	Effective
PL2	Veolia ES Cleanaway (UK) Ltd	EA/EPR/BP3999CU/A001	Veolia ES Cleanaway (UK) Ltd	Modified
PL3	Pinches 3 Landfill	EA/EPR/WP3299VG/V002	V & J Kelly Ltd	Closure

According to information provided in an HRA review (Golders, 2015) for the Veolia ES Landfill site (PL1), the landfill comprises a small area of inert waste deposition in the southeast and a larger area which accepted inert, hazardous and non-hazardous waste. This larger area has an engineered composite containment liner system on the base and lower sides and an associated groundwater monitoring network for groundwater levels and quality.

No details of the other sites are currently known.

2.2 Proposed development

A Planning Application was submitted in 2021 to formalise the proposed restoration contours to enable the restoration of the site to be completed. The proposals can be summarised as follows:

- Importation of material for use in stabilisation of eastern boundary with the Veolia Landfill site
- Importation of inert material to be placed in southwestern corner to achieve restoration contours and a screening bund
- Removal of remaining sand reserves to 150 mAOD where these would be sterilised by stabilisation and restoration works
- Continued removal of remaining sand reserves and importation of inert materials to achieve restoration profile

The estimated volume of sand to be removed is 245,000 tonnes and the volume of inert fill required to complete the restoration, to a level lower than original ground levels, is 975,000 m^3.

a) Waste types

The materials to be imported into the site have been detailed in 'Waste Recovery Plan. NRS Bromsgrove Aggregates Ltd. Sandy Lane Quarry. Version 1. Westbury Environmental, July 2021', and are summarised in *Table3308/ESSD/T4* below. The site will only accept materials classified as non-hazardous, excluding wastes which are solely or mainly of dusts, powders or loose fibres, and not in a form that is either sludge or liquid.

3308/ESSD/T4: Permitted waste types				
Source	**Sub-source**	**Waste code**	**Description**	**Additional restrictions**
01: Waste resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 01: Wastes from mineral excavation	01 01 02	Wastes from mineral non-metalliferous excavation	Restricted to waste overburden and interburden only
	01 04: Wastes from physical and chemical processing of non-metalliferous minerals	01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 06	
		01 04 09	Waste sand and clays	
02: Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	02 04: Wastes from sugar processing	02 04 01	Soil from cleaning and washing beet	Will be limited to placement within upper 0.5 m only
10: Wastes from thermal processes	10 12: Wastes from manufacture of ceramic goods, bricks, tiles and construction products	10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)	
	10 13: Wastes from manufacture of cement, lime and plaster and articles and products made from them	10 13 14	Waste concrete	
17: Construction and demolition wastes	17 01: Concrete, bricks, tiles and ceramics	17 01 01	Concrete	
		17 01 02	Bricks	
		17 01 03	Tiles and ceramics	
		17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those	Metal from reinforced concrete must have been

3308/ESSD/T4: Permitted waste types				
Source	**Sub-source**	**Waste code**	**Description**	**Additional restrictions**
			mentioned in 17 01 06	removed
	17 03: Bituminous mixtures	17 03 02	Bituminous mixtures other than those mentioned in 17 03 01	Road planings only
	17 05: Soil, stones and dredging spoil	17 05 04	Soil and stones other than those mentioned in 17 05 03	Restricted to topsoil, peat, subsoil and stones only Topsoil and peat will be limited to placement in the upper 0.5 m only
19: Wastes from waste management facilities	19 12: Wastes from the mechanical treatment of waste (eg sorting, crushing, compacting, pelletising) not otherwise specified	19 12 09	Minerals (eg sand, stones) only	Restricted to wastes from treatment of waste aggregates that are otherwise naturally occurring minerals. Does not include fines from treatment of any mixed non-hazardous waste or gypsum from recovered plasterboard
		19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of waste other than those mentioned in 19 12 11	Restricted to crushed bricks, tiles, concrete, ceramics, and soils from the mechanical treatment of construction/ demolition waste. Metal from reinforced concrete must be removed. Does not include gypsum from recovered plasterboard
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	20 02: Garden and park wastes	20 02 02	Soils and stones	Restricted to topsoil, peat, subsoil and stones only Topsoil and peat will be limited to placement in the upper 0.5 m only.

The majority of the restoration materials will be imported from local construction activities and suitable materials produced locally eg aggregate recycling facilities. All incoming material will be subject to the rigorous Waste Acceptance Procedures as provided elsewhere in the Application. The waste will be in compliance with the Landfill Directive description of Inert waste, hence Hazardous substances are not anticipated to occur. Additional comments on specific waste codes are included below:

- Code 10 13 14 will be sourced from waste concrete from concrete manufacture; this is likely to form only a very small portion of the materials used for restoration as preference would be for re-use as a crushed aggregate, and hence poses a commensurately low risk
- Code 19 12 12 is non-hazardous; Any waste fines from construction and demolition treatment plants identified under code 19 12 12 will be subject to inert Waste Acceptance Criteria (WAC) chemical testing to ensure it meets the Inert waste WAC.
- It is not anticipated that much, if any, road planings will be deposited into the void under code 17 03 02. Provision has been allowed should it be required to facilitate vehicle transit in eg winter conditions. In this way the overall volume to be deposited is considered to be low and all deposits will be required to meet the Inert Waste WAC. It is generally preferable (financially) to recycle this material.

a) Phasing

It is proposed that restoration of the site will be completed over a period of 6 years. The first phase will involve construction of the buttress wall using selected waste that will meet the WAC criteria and a geotechnical specification. Waste will be placed in 300 mm thick layers, compacted in place.

b) Waste volumes

In order to achieve the approved restoration profile, approximately 975,000 m^3 of inert fill will be imported to the site.

c) Restoration and afteruse

The final restoration scheme and contours is provided as *Drawings 3308/ESSD/05.*

d) Site layout and design

The site layout and design is illustrated on *Drawing 3308/ESSD/02*. The site entrance, car park, offices and weighbridge are located in the east of the site. Hardstanding is present in the facilities area comprising concrete pads beneath the site offices and adjacent parking area.

No active water management currently occurs at the site as all incident rainfall infiltrates. It is apparent that during the winter months run-off from the adjacent Veolia Landfill and the parts of the hardstanding area, collects in the southeastern quarter of the site.

A small self-regulating waterbody also exists in the centre of the site and this is assumed to be groundwater level.

2.3 Proposed management measures

Management measures will be implemented in order to ensure the safe operation of the proposed waste recovery facility and ensure no environmental impact. These measures are discussed below.

2.3.1 Control of incoming waste

In order to ensure the incoming waste is appropriate for acceptance at the site there will be:

- Strict enforcement to Waste Acceptance Criteria and procedures
- Detailed knowledge of where imported waste has been generated
- Requisite testing before receipt on-site

2.3.2 Monitoring of groundwater quality

Monitoring of groundwater in boreholes surrounding the site will continue throughout the life of the proposed development including the active and post-closure phases, as described in Section 6 below. Monitoring infrastructure that becomes inoperable will be replaced as necessary.

2.3.3 Monitoring of gas concentrations

Monitoring of gas concentrations within the waste mass will be undertaken in gas monitoring borehole constructed once final fill levels have been reached. This ensures boreholes are not damaged during infilling and restoration works. Boreholes will be constructed at a density in accordance with the prevailing guidance. Monitoring infrastructure that becomes inoperable will be replaced as necessary.

2.3.4 Settlement

Differential settlement is not anticipated due to the proposed waste types to be accepted at the site. The site and its immediate vicinity are not in an area of former mining, hence subsidence due to mine failure is also not expected.

Post-settlement contours for the proposed restoration scheme are provided on *Drawing 3308/ESSD/05*.

2.3.5 Hydrogeological Risk Assessment (HRA)

A Hydrogeological Risk Assessment has been undertaken and the results are provided in report entitled Hydrogeological Risk Assessment. Sandy Lane Quarry, Ref 3308/HRA. Dated June 2024.

3 PATHWAY AND RECEPTOR

3.1 Geology

3.1.1 Bedrock

The regional bedrock geology is illustrated on *Drawing 3308/ESSD/06* and the geological succession in the area is summarised in *Table 3308/ESSD/T5*.

The area is structurally complex with a number of significant faults.

The site is underlain by sandstones of the Sherwood Sandstone Group, which in this area comprise the Helsby Sandstone Formation, Wildmoor Sandstone Member and Chester Formation. Immediately to the west of the site the Sidmouth Mudstone Formation outcrops, and stratigraphically overlies the Sherwood Sandstone Group, but is fault bounded in this locality. The Sherwood Sandstone Group rests unconformably on Carboniferous, Warwickshire Group, strata of the Clent and Salop Formations[1].

3308/ESSD/T5: Regional stratigraphy				
	Group	**Formation**		**Lithology**
Superficial Deposits			Alluvium	Clay, silt sand and gravel
			Diamicton (Till)	
			Glaciofluvial deposits	Sand and gravel
			Alluvial Fan Deposits	Sand and gravel
			Kidderminster Station Member	Sand and gravel
			Holt Heath Sand and Gravel Member	Sand and gravel
Bedrock		Sidmouth Mudstone		Mudstone and siltstone
	Sherwood Sandstone (SSG)	Helsby Sandstone		Fine- to medium-grained sandstone
		Wilmslow Sandstone	Wildmoor Sandstone Member	Silty, fine- to medium-grained sandstone and thin mudstones
		Chester		Sandstone and conglomerate
	Warwickshire	Clent		Conglomerate
		Salop	Enville Member	
			Alveley Member	Red mudstone and sandstone

[1] On the geological map, the BGS have given the Clent and Chester Formations the same colour code

Sandy Lane Quarry lies within the Wildmoor Sandstone Member, the outcrop of which is bounded to the east and west by north-south aligned faults. The Formation comprises a red brown silty, fine to medium-grained weak sandstone with subordinate and discontinuous siltstone and mudstone layers. It is reported to be up to 284 m thick in the Worcester Basin and in the Wildmoor N° 2 borehole the base is reported to be at a depth of approximately 143 m. The strata dip at around 8° to the southwest (BGS, 2009).

3.1.2 Superficial deposits

Superficial deposits are relatively sparse in the area and none are present in the immediate vicinity of the site.

To the east, alluvial deposits and sand and gravel assigned to the Holt Heath Sand and Gravel Member are confined to the floor of the Battlefield Brook valley and its tributary valleys. Alluvial Fan Deposits (sand and gravel) are present on the valley sides.

To the north, either side of Fenn Brook, are sands and gravels of the Kidderminster Station Member and Holt Heath Sand and Gravel Member. On the higher ridge line running to the northeast of the site there are deposits of Glacial Till.

3.1.3 Geology of the site

Numerous boreholes have been drilled around the wider site as part of the Veolia Landfill operation, four of these are close to the site. Groundwater monitoring boreholes SAN 800, 809, 810, and 821 are located to the northwest, southwest and north respectively. Geological logs for these boreholes are not available, however, the BGS holds logs for two other boreholes at the Veolia site; SO97NE457 and SO97NE456. These boreholes were drilled in 1991 and prove sandstone to a depth of 50 m below ground level (104 mAOD).

Four groundwater monitoring boreholes were drilled at the site in July 2023. Borehole BH1 is located in the northwest of the site and Boreholes BH2, BH3 and BH4 are located in the south from west to east respectively. The boreholes only encountered sandstone which was proven to a depth of up to 34 m and an approximate elevation of 133 m AOD. The base of the sandstone was not proven at the site. The locations of the boreholes are provided on *Drawing 3308/ESSD/02* and the Construction Quality Assurance report is provided in *Appendix 3308//ESSD/A3*.

3.2 Aquifer characteristics

3.2.1 Aquifer status and regional context

The Sherwood Sandstone Group is classed by the Environment Agency as a Principal Aquifer and is a regionally important groundwater resource for industrial use and public water supply.

The site lies within the Worcestershire Middle Severn – PT Sandstone (GB40901G300800) Groundwater body. The Cycle 3, 2019, classification is Poor for both quantitative and chemical status.

The site lies within the Kidderminster and Stourport Groundwater Management Unit (GWMU) and immediately adjacent to the boundary with the GWMU to the south (Bromsgrove West) as shown on *Drawing 3308/ESSD/07*.

This area of the aquifer is over abstracted, which has resulted in a long-term fall in groundwater levels. Consequently, there has been a loss, or reduction, in baseflow to watercourses in the area, in particular, Battlefield Brook.

The whole of the Sherwood Sandstone outcrop within the Worcestershire Middle Severn Abstraction Licence Strategy (ALS)(June 2022) report prepared by the Environment Agency, is identified as 'No Water Available' meaning the aquifer is over abstracted. Virtually the whole of the sandstone aquifer is also designated as an outer source protection zone (SPZIII). The closest groundwater source is located 1.1 km to the southeast of the site (Wildmoor public water supply abstraction).

The site is not located within a Drinking Water Safeguard Zone, for groundwater. It is located within groundwater Nitrate Vulnerable Zone (NVZ) for the West Midlands (N° G29).

3.2.2 Aquifer properties

Hydraulic conductivity is primarily controlled by granular flow. Aquifer properties for the Wildmoor Sandstone are provided in Allen et al, 1997 and shown in *Table 3308/ESSD/T6*.

3308/ESSD/T6: Hydraulic properties of the Wildmoor Sandstone

Parameter	Range	Interquartile range	Median	Geometric mean
Core hydraulic conductivity (m/d)	3.1×10^{-4} – 12.0	0.12 – 1.58	0.73	0.37
Bulk hydraulic conductivity (m/d)	0.77 – 62.6	3.06 – 19.1	12.1	8.06
Porosity (%)	17.6 – 35.3	24.2 – 28.2	26.9	26.4

The Sherwood Sandstone aquifer is known to have marked heterogeneity with the vertical hydraulic conductivity often being 10 times lower than the horizontal due to the presence of thin clay or silty horizons within the body of the aquifer.

3.2.3 Groundwater abstractions

Licensed abstractions

Please note, this section has not been updated since the issue of the Final Version F1.

Three licensed groundwater abstractions have been identified within 2 km of the site boundary, as shown on *Drawing 3308/ESSD/07*.

Licence MD/054/0006/016, Beechcroft Nurseries, Belbroughton, is located 680 m to the north of the site at NGR SO 95182 77091. The source is used for direct spray irrigation. Licence N° 18/54/07/003, Meadow Farm Alleviation borehole, is located 1.5 km southeast of the site at NGR SO 9568 7480. The source is operated by Severn Trent Water and provides remedial wetland support. This licence had an expiry date of 31st March 2021 and it is assumed that it has now been renewed.

Licence N° 18/54/07/0134 comprises two boreholes located 1.1 km southeast of the site at NGR SO 955 751. The abstraction is operated by Severn Trent Water for public water supply. Data from the BGS borehole records database describe the boreholes as being artesian on completion in 1953.

3.3 Groundwater flow

3.3.1 Groundwater levels

Environment Agency

There is one active Environment Agency monitoring borehole nearby, Fairfield N° 2, located 0.6 km southeast of the site (*Drawing 3308/ESSD/07*). Data from January 2009 onwards has been supplied by the Environment Agency and is shown on *Drawing 3308/ESSD/08a*. Data prior to 2009 has been obtained from the Veolia Environmental Services planning application (2013) and are shown on *Drawing 3308/ESSD/08b)*.

The historical data show a decline in groundwater levels in the late 1980s, when it is presumed that groundwater levels dropped below the base of the Fairfield N° 1 observation borehole. Abstraction records were not requested as part of this study, but it was inferred in the Veolia report that this decline was a consequence of increased groundwater abstraction.

Since 2009 the groundwater elevation has varied between approximately 128.5 mAOD and 133.5 mAOD.

The hydrographs show strong medium-term cyclical fluctuations in level, with peak levels in July 1996, April 2002, January 2010 and May 2015. No strong seasonal variations are apparent

in the data. Groundwater levels reached a minimum in September 2019 and have been rising since then. The reason for this cyclical behaviour is discussed below.

Veolia

There are up to twelve monitoring boreholes installed around the adjacent Veolia Landfill site, four of which (Nos SAN 800, 810, 809 and 807) lie close to the site. Their approximate locations (taken from a site plan provided by Westbury Environmental Ltd) are shown on *Drawing 3308/ESSD/07*.

Groundwater level data from these monitoring boreholes are available from the Veolia Environmental Services planning application (2013). The hydrographs, covering the period 1995 to 2012, are shown on *Drawing 3308/ESSD/09*. Groundwater levels show the same medium-term fluctuations apparent in the Fairfield No 2 borehole.

These trends can be correlated with changes in the rainfall pattern, which can be visualised using a plot of the cumulative deviation from mean rainfall (CDFM). This is shown on *Drawing 3308/ESSD/09*, calculated from the CEH dataset. This analysis illustrates that during periods when monthly rainfall exceeds the mean rainfall (rising trend on the graph) groundwater levels are rising.

The highest groundwater levels are consistently recorded in SAN821 and SAN825, located on the north side of the facility. Data for a third borehole to the northwest, SAN800, is only available from November 2010, but it recorded similar groundwater levels to SAN821 and SAN825. All the other boreholes are located along the southern boundary of the facility and together these data indicate that the groundwater level is consistently lower to the south.

The bottom hydrograph on *Drawing 3308/ESSD/09* shows data from the Veolia site recorded since 2018 (data provided in *Appendix 3308/ESSD/A1*). One significant difference from the earlier data is that the groundwater levels in SAN825 are now between 3.8 and 5.9 m lower than SAN821. There is also a sudden drop in water levels in SAN821, SAN809 and SAN805 in August 2019 with levels recovering in February 2020 (SAN805), May 2020 (SAN809) and August 2020 (SAN821). The reason for these changes is unknown.

Closest to the site, groundwater levels in SAN821, in the northeast, and SAN810 in the southeast, are in the region of 146 mAOD and 143 mAOD respectively.

On-site monitoring

Four groundwater level boreholes were constructed around the site in July 2023. Borehole BH1 is in the northwest and the remaining boreholes are located along the southern site boundary.

Groundwater levels have been recorded on three occasions, in July 2023, October 2023 and June 2024. It is apparent that the groundwater boreholes have not been levelled relative to Ordnance Datum, with only approximated elevations provided. As a result these groundwater levels have not been used in the assessment and additional data together with boreholes elevation data will be obtained. In addition, some of the data appears anomalous. Further investigation is required before absolute groundwater elevations below the site can be confirmed.

Spatial distribution

To illustrate groundwater flow directions, groundwater levels have been plotted for January 2001, a period of high groundwater levels, as shown on *Drawing 3308/ESSD/10a*. This flow direction, south-southeast, appears to have been maintained under varying groundwater level conditions between 1995 and 2012. However, the latest groundwater level data (*Drawing 3308/ESSD/10(b)*) show that groundwater flow has changed to a more easterly direction towards Battlefield Brook. The reason for this is also unknown. A change in the abstraction regime at the Wildmoor PWS abstraction would most likely result in a rise or fall in groundwater levels, rather than a change in direction of flow alone.

Recent monitoring within the site itself (October 2023 data) indicates a general southeast direction of groundwater flow, with boreholes BH1 and BH2 being up gradient of the site. The results of the groundwater level monitoring to date are provided in Appendix 3308/ESSD/A1.

The inferred hydraulic gradient is between 0.02 and 0.03 based on the 2021 groundwater contours.

Unsaturated thickness

The base of the site/floor of the quarry will be at 150 mAOD. The highest recorded groundwater level in the vicinity of the site (SAN825) is 147.67 mAOD recorded in January 2002. More recently the highest groundwater level recorded closer to the site was 146.5 mAOD at borehole SAN821 to the northeast. The site will therefore remain above the watertable, which is approximately 3.5 m below the base of the site. This represents the smallest unsaturated zone (most conservative) between the site and the groundwater in the Wildmoor aquifer as it is based on the highest groundwater elevation.

To the southeast of the site the highest groundwater level recently recorded is 144.19 mAOD recorded at Borehole SAN810. This indicates a minimum unsaturated zone of 5.81 m in the south of the site. In order to maintain a conservative assessment, the above estimated unsaturated zone of 3.5 m will be retained in the assessment within the HRA.

3.3.2 Groundwater quality

Groundwater quality data for the site are available for monitoring in July and October 2023 and June 2024. The data are provided in *Appendix 3308/ESSD/A2* and is summarised below.

3308/ESSD/T7: Groundwater quality from onsite boreholes 2023 to 2024

Parameter	Units	UK DWS	Max	Mean	Min	SD	Count	Count if > DWS
pH		9.5 - 6.5	7.4	6.7	6.1	0.35	12	0
Electrical conductivity	µS/cm	2500	1290	724.3	138	433.41	12	0
Alkalinity as CaCO3	mg/l		161	88.8	52.2	37.24	12	0
Ammoniacal nitrogen as N	mg/l		1.32		0.06	0.34	12	0
Ammonium an NH4	mg/l	0.50	0.18		0.08	0.04	8	0
Chloride as Cl	mg/l	250	305	119.1	5.4	123.26	12	3
COD (Total)	mg/l		166	58.4	11	62.83	12	0
Sulphate as SO4	mg/l	250	151	64.9	6.7	54.01	12	0
Arsenic total	mg/l	0.01	0.0011	0.00061	0.00027	0.00	12	0
Cadmium total	mg/l	0.005	0.0061	0.00148	0.00008	0.00	12	1
Calcium total	mg/l		161	83.2	21.7	44.63	12	0
Chromium total	mg/l	0.05	0.0041	0.00119	0.00051	0.00	12	0
Copper total	mg/l	2	0.2	0.0303	0.0023	0.06	12	0
Iron total	mg/l	0.2	2.7	0.3443	0.025	0.75	12	4
Lead total	mg/l	0.01	0.011	0.0016	0.0003	0.00	12	1
Magnesium total	mg/l		49.1	15.7	2.2	12.85	12	0
Manganese total	mg/l	0.05	1.6	0.44	0.0119	0.57	12	10
Mercury	mg/l	0.001	0.00001		0.00001	0.00	12	0
Nickel total	mg/l	0.02	0.068	0.0217	0.0037	0.02	12	3
Potassium total	mg/l		10	6.69	2.1	2.69	12	0
Sodium total	mg/l	200	110	51.09	3.7	41.09	12	0
Zinc total	mg/l		0.2	0.11	0.027	0.06	12	0

BTEX (benzene, toluene, ethyl benzene and xylene) concentrations were below the level of detection in all samples from all boreholes. Concentrations of PAH substances (polyaromatic hydrocarbons) were also below the level of detection in all samples with the exception of those collected on the 26th July 2023 in boreholes BH2, BH3 and BH4 in the south of the site. Detectable PAH's may have occurred on this first sampling visit as a result of residues remaining in the boreholes form the drilling. No PAH has been recorded since this first sampling round.

Low concentrations of petroleum hydrocarbons have also been detected within the longer carbon chain range of C24 to C40 at some point in all boreholes and shorter chain hydrocarbons, C10 to C16 at BH1 on the 24th October 2023 only.

Data have been provided for the period 2018 to 2020 for monitoring boreholes at the adjacent Veolia Landfill site (*Table 3308/ESSD/T7*). It should be noted that based on the more recent groundwater flow direction, eastwards, all these boreholes are down-gradient of the site. The data is provided in *Appendix 3308/ESSD/A2*.

A Hydrogeological Risk Review for the Veolia site (Golders, 2015) concluded that concentrations of the key parameters being monitored (Ammoniacal nitrogen, chloride, electrical conductivity (EC), cadmium, mercury, naphthalene, mecoprop, toluene, chlorobenzene and dichloromethane) were comparable to those recorded in the previous HRA Review undertaken in 2009, ie trends of increasing concentration are not apparent.

3308/ESSD/T8: Groundwater quality from the Veolia Landfill site (2018-21)					
Up-gradient monitoring					
Borehole	821	825			
Nº samples	10	9			
Chloride (mg/l)	5.9 – 11	9.4 – 35.5			
EC (µS/cm)	168 – 201	180 – 406			
pH	5.33 – 7.02	5.68 – 7.09			
Down-gradient monitoring					
Borehole	802	805	807	809	810
Nº samples	10	22	22	22	22
Chloride (mg/l)	27.1 – 31	10 – 13.7	7.3 – 8.9	10.8 – 30.1	34.1 – 28
EC (µS/cm)	296 – 349	166 – 207	145 – 161	198 – 304	387 – 297
pH	5.54 – 6.33	5.68 – 7.31	4.35 – 7.23	4.3 – 7.11	5.33 – 6.93

3.4 Surface water

3.4.1 Rainfall

Rainfall at the site has been estimated using the CEH-GEAR dataset available from the UK Centre for Ecology and Hydrology. The average rainfall between 2000 and 2015 is shown in *Table 3308/ESSD/T9* and is estimated as 800 mm. The maximum annual rainfall for this period was 1031 mm in 2012 and the minimum 746 mm in 2015.

3308/ESSD/T9: Average rainfall for SO 9509 7629 (2000 - 2015)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	65.2	53.2	46.5	57.8	69.7	64.9	76.2	70.4	54.8	91.2	79.3	71.1
Source: CEH Gridded Estimates of Areal Rainfall (CEH - GEAR) data licensed from NERC – Centre for ecology & Hydrology. © Database Right/Copyright NERC – Centre for Ecology & Hydrology. All rights reserved												

Historical rainfall data and evapotranspiration data have also been obtained from MAFF Technical Bulletin 34 for this area (Area 19) and are shown in *Table 3084/ESSD/T10*.

3308/ESSD/T10: Historical rainfall data from MAFF Area 30												
(mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	62	46	47	47	61	51	59	73	60	58	71	65
PT	1	8	30	55	80	93	93	72	43	19	4	0
ER	61	38	17	0	0	0	0	1	17	39	67	65
PT – Potential Transpiration ER – Effective Rainfall												

The indicated annual Long-Term Average (LTA) rainfall is 700 mm, which is somewhat lower than that derived from more recent inferred data. The effective rainfall, based on the MAFF data is 305 mm.

If the evapotranspiration values are applied to the more recent rainfall data set, the annual effective rainfall is estimated as 359 mm.

3.4.2 Watercourses

There are three Ordinary watercourses within 2 km of the site boundary, as shown on *Drawing 3308/ESSD/11*:

- Fenn Brook lies 0.72 km to the northwest, flowing from northeast to southwest and turning westwards at Bell End. It is a tributary of Hoo Brook, which flows into the River Stour, located approximately 12 km west of the site
- Battlefield Brook is approximately 0.9 km to the southeast, flowing northeast to southwest. The brook has suffered from low flows due to a decline in groundwater levels which has reduced the baseflow into the watercourse. A borehole provides water to supplement the surface flow (Licence n° 18/54/07/003, Section 3.2.3)
- Hockley Brook rises approximately 0.96 km southwest of the site and flows westwards. Both Hockley Brook and Battlefield Brook are tributaries of the River Salwarpe.

Surface water catchment status

The site lies on the eastern edge of the 'Hoo Brook – source to confluence R Stour' Waterbody (ID GB109054044530). The 2019 classification of the catchment is 'Moderate' for ecological criteria and 'Fail' for chemical criteria. The reasons for not achieving 'Good' status were PFOS substances, sewage discharges, poor nutrient management, poor pesticide management and urbanisation. Flow was also identified as a contributor to not achieving 'Good' status, but causes were stated to be 'under investigation'.

To the east, the adjacent waterbody is the 'Battlefield Brook – source to confluence Spadesbourne Brook' (ID GB109054044240). The 2019 classification of the catchment is 'Moderate' for the ecological criteria and 'Fail' for chemical criteria. The reasons for not achieving 'Good' status were poor nutrient management, urbanisation, poor livestock management and groundwater abstraction.

Information on the surface water resource status is provided in the Environment Agency's Worcestershire Middle Severn Abstraction Licensing Strategy (ALS) (June 2022). Within the catchment in which the site is located, surface water availability is restricted for abstraction at all flows.

The site is not located within a Drinking Water Protected Area, or Safeguard Zone, for surface water. It lies within surface water Nitrate Vulnerable Zone (NVZ) S94 ('R Stour (Worcs) – conf Smestow Brook to conf R Severn').

3.4.3 Waterbodies

There are a number of bodies of open water within 2 km of the site boundary. The closest are associated with former and current sand workings in the immediate vicinity of the site.

Two waterbodies are shown within the void of Wildmoor Quarry on the 1:25,000-scale OS map. The larger of the two (WB3 on *Drawing 3308/ESSD/11)* is also present on satellite imagery. The second waterbody shown on the OS map is not present on recent satellite imagery. However, the imagery shows another body of water is present to the south in an apparent area of new mineral extraction.

Waterbody P2 lies within an area of former mineral workings to the east of the Veolia Landfill. LiDAR data suggest a water level elevation of around 152.7 mAOD.

There are two waterbodies, P3 and P4, along the course of Fenn Brook and two waterbodies (P6) on Battlefield Brook. These waterbodies are the remains of former mill ponds.

Waterbody P5 is located further from the site on a tributary of Fenn Brook.

3.4.4 Springs and wells

Two springs are located within 2 km of the site shown on the 1:25,000-scale OS map. These are shown on *Drawing 3308/ESSD/11* as 'S1', approximately 1.2 km to the southwest, and 'S2' 1.7 km to the northeast.

A well is noted on the OS map, located approximately 0.9 km east of the site near Key Hill Farm.

3.4.5 Surface water abstractions

Licensed abstractions

There are two licensed surface water abstractions within 2 km of the site boundary, both abstracting from Battlefield Brook:

- Licence N° 18/54/07/0057, located at Mill Cottage Farm at NGR SO 958 748. Abstraction is licensed for direct spray irrigation between 1st May and 30th September each year
- Licence No 18/54/07/0168 at Top Lane, Wildmoor, NGR SO 962 756. Licensed for direct spray irrigation throughout the year

3.4.6 Flood risk

Sandy Lane Quarry is located within Flood Zone 1 on the Environment Agency's Flood Map for Planning. Flood Zone 1 is land designated as having an annual probability of fluvial flooding less than 0.1 % (<1 in 1000).

3.5 Man-made sub-surface pathways

There are no known buried services located across or within 500 m of the site.

3.6 Habitats and natural heritage receptors

Statutory habitat sites

There are no sites of international importance (SAC, SPA or RAMSAR) within 5 km of the site boundary.

There are four Sites of Special Scientific Interest (SSSI) within 2 km of the site boundary: Madeley Heath Pit SSSI; Feckenham Forest; Hurst Farm Pasture and Sling Gravel Pits. Summary details are provided in *Table 3308/ESSD/T11* and their locations are shown on *Drawing 3308/ESSD/12*.

3308/ESSD/T11: SSSIs within 2 km of the site boundary		
Site name	**Distance from site boundary (km)**	**Reasons for notification**
Madeley Heath Pit	770 m NE	Notified for its geological interest Site at an elevation of just over 200 mAOD
Feckenham Forest	1.1 km SW	Notified for its oak-dominated ancient woodland associated with unimproved meadows. There are streams noted on the site and damp areas in depressions Site is located entirely on Mercia Mudstone bedrock and therefore isolated from groundwater in the underlying Sherwood Sandstone aquifer
Hurst Farm Pasture	1.7 km WSW	Notified for the diversity of semi-natural grassland Site is located entirely on bedrock comprising mudstones of the Mercia Mudstone Group
Sling Gravel Pits	1.7 km N	Notified for its geological interest

Sling Gravel Pits and Madeley Heath Pit are designated for their geological interest and are not considered further in this assessment. Both Feckenham Forest and Hurst Farm Pasture SSSI's are located on the Mercia Mudstone bedrock and are therefore unaffected by groundwater flows or quality in the Sherwood Sandstone aquifer. Of these, only Feckenham Forest is identified as a Groundwater Dependent Terrestrial Ecosystem (GWDTE).

There are no Local or National Nature Reserves within 2 km of the site boundary.

Non-statutory habitat sites

There are three non-statutory Local Wildlife Sites (LWS) located within 2 km of the Application boundary as shown on Drawing *3308/ESSD/12* and detailed below.

3308/ESSD/T12: Non-statutory conservation sites within 2 km of site boundary		
Site name	**Distance from site boundary (km)**	**Reasons for notification**
Hadley, Elmley & Hockley Brooks LWS	0.97 m SW	Site includes several National BAP habitats, rivers and streams, unimproved neutral grassland, wet woodland and marshland
Sling Pool and Marsh LWS	1.2 km NW	Carr woodland and silty swamp emergent zone at the head of the pool
Great Farley and Dale Woods LWS	1.4 km N	An extensive area of ancient woodland with varied terrain, stream valleys and three different broadleaf woodland habitats

None of these sites are down-gradient of the site.

Natural heritage sites

The closest natural heritage site is The Old Toll House, a Listed Building, located approximately 75 m southwest of the site. Other Listed Buildings in close proximity to the site are listed in *Table 3308/ESSD/T12* below.

The only Scheduled Monument in close proximity to the site is the Moated Site at Fairfield Court, 335 m southwest of the site.

3308/ESSD/T13: Natural heritage sites within 500 m of site boundary	
Land use	**Distance/direction from site**
Listed buildings:	
The Old Toll House	75 m SW
Fairfield Court	370 m SW
Lower Madeley Farmhouse	442 m N

3.7 Amenity receptors

Amenity receptors comprising those features that might be affected by noise or dust include residential properties, schools, hospitals, playing fields, business etc are listed in *Table 3308/ESSD/T1* and are shown on *Drawing 3308/ESSD/03*.

4 RECEPTORS AND COMPLIANCE POINTS

The baseline environmental and hydrogeological data have been used to develop a site conceptual model to identify the key aspects of the site, its' setting and potential pathways and receptors. The schematic cross-section of the conceptual model is provided as *Drawing 3308/ESSD/13* and cross-sections of the proposed restoration profile are appended to the Waste Recovery Plan (Westbury Environmental, July 2021).

4.1 Groundwater flow pathways

The site is above the watertable within the Sherwood Sandstone aquifer in which the site lies. A limited unsaturated zone of between 3.5 m and 5.81 m exists. Any pollutants from the waste will travel vertically through the unsaturated zone to the watertable. Pollutants would then travel in the direction of groundwater flow, ie to the east-southeast.

Superficial strata is absent from the site hence no pathways exist in superficial strata.

4.2 Groundwater receptors

No superficial aquifers exist at the site and hence these cannot be a receptor. Groundwater exists below the base of the site with the Sherwood Sandstone aquifer, and this forms the primary groundwater receptor.

The site lies within the catchment of a Severn Trent Water public supply borehole, this forms a secondary groundwater receptor. Other licensed abstractions are either up-hydraulic gradient or further away from the site than the public supply borehole.

4.3 Surface water pathway

There will be no water discharges from the site. Dewatering is not required and surface water will be managed within the curtilage of the site. Surface water does not therefore act as a direct pathway from the site.

4.4 Surface water receptor

Groundwater flow is to the east and may provide some baseflow to Battlefield Brook, which flows southwestwards, east of the site. Battlefield Brook forms a secondary receptor.

4.5 Habitat receptors

Whilst a single GWDTE or water-supported ecological site has been identified in the vicinity of the site this lies to the west and up-hydraulic gradient of the site and therefore does not form a plausible receptor.

There are no surface water-supported statutory or non-statutory environmental or ecological sites of interest within a sufficient distance to be impacted by the proposed development.

4.6 Compliance points

Groundwater compliance points will comprise groundwater beneath the site for hazardous substances and groundwater at the site boundary for non-hazardous pollutants.

As off-site discharge of surface water will not be required, surface water is not a direct receptor and surface water compliance points are not required.

5 POLLUTION CONTROL MEASURES

5.1 Site engineering

A Hydrogeological Risk Assessment has been undertaken to identify the need for pollution control measures at the site. The results of the assessment indicate that the following pollution control measures are required.

5.1.1 Basal and side slope engineering

As the site is not a landfill and due to the proposed nature of the restoration materials, leachate collection is not required, hence an artificial sealing liner is not necessary.

However, risk assessment indicated that an artificial geological barrier will be necessary to protect the water environment. This shall take the form of selected inert materials placed to achieve a layer 1 m thick with a maximum permeability of 5 x 10^{-9} m/s or equivalent.

5.1.2 Capping requirements

The site will be operating under a waste recovery permit and there is no requirement for an engineered low permeability cap. The infill will be lower permeability than the surrounding sandstone and therefore no cap is proposed.

5.2 Surface water management

5.2.1 Operational phase

Currently surface water from the part of the adjacent Veolia Landfill and from the hardstanding area at the site entrance drains into the existing void and collects before gradually soaking away. No active surface water management occurs.

It will be necessary for run-off from the east to be directed away from the void during the operational phase. This will be achieved by construction of an eastern perimeter ditch and berm to prevent inflow of surface water run-off. This will direct collected water southwards to a new retention basin north of the existing site access track and southwest of the Veolia landfill. This is subject to the agreement of Veolia.

5.3 Post-closure controls

5.3.1 After-use

The proposed after-use for the site comprises creation of wildlife habitat in line with Worcestershire's Biodiversity Targets. It will incorporate woodland blocks, further tree and shrubs, acidic species-rich grassland and marginal and wetland areas.

5.3.2 Surface water management

The agreed restoration scheme includes a sloping profile draining to a surface water management pool in the northwestern corner of the site. This will be constructed against a section of residual exposed sandstone quarry face where excess water will soak away. The size of the pool will vary seasonally, and the margins will provide varied wetland habitat. Active surface water management will therefore not be needed in the long-term.

The design has been agreed and the related planning condition signed off.

5.3.3 Subsistence and settlement

It is considered that settlement of the restored landform will be negligible due to the types of material to be accepted by the site and the method of placement. Post-settlement contours are provided as *Drawing 3308/ESSD/05*.

6 MONITORING

6.1 Weather

Weather monitoring is not required for this site.

6.2 Landfill gas

Due to the nature of the materials being imported to the site, the probability of landfill gas being generated is considered to be negligible. Therefore, it is unnecessary to undertake a landfill gas risk assessment.

Nevertheless, to help collect data to demonstrate that the site is chemically and physically stable for Permit surrender, landfill gas monitoring will be undertaken in the perimeter boreholes.

When infilling has reached final levels in-waste boreholes will be constructed at a density in accordance with current guidance, to allow confirmation of the chemical stability of the waste.

6.3 Groundwater

6.3.1 Groundwater infrastructure

Groundwater monitoring boreholes have been constructed in the northwest and south of the site to supplement the existing Veolia monitoring points to the northeast and southeast . These allow groundwater level and quality samples to be obtained.

6.3.2 Groundwater monitoring locations

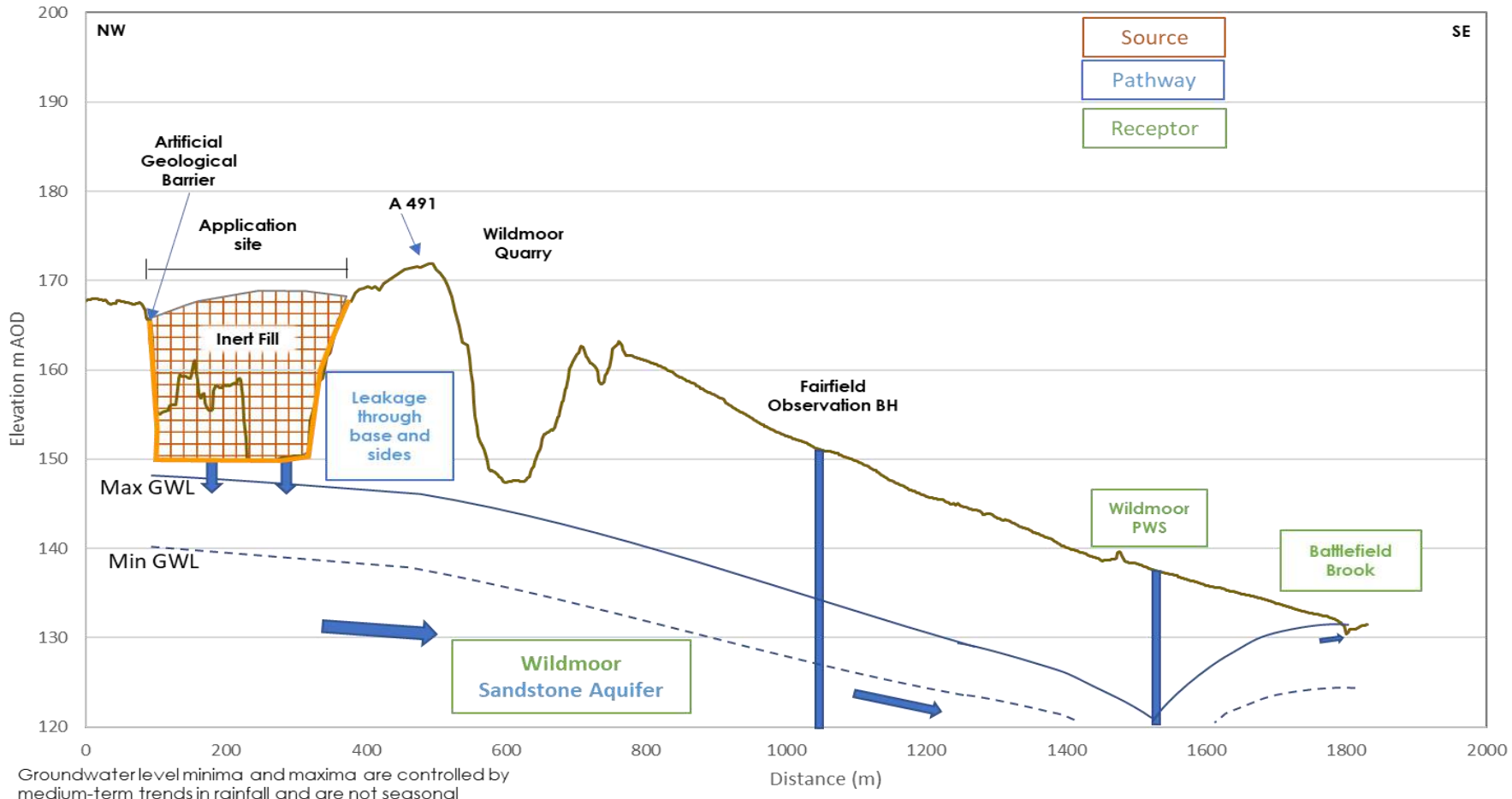
It is proposed to drill four new boreholes one on each of the four sides of the site to facility future groundwater and landfill gas monitoring. These will supplement the existing Veolia boreholes.

The proposed monitoring scheme is discussed in Section 3 of the accompanying HRA report.

6.4 Surface water monitoring

The conceptual site model has indicated that surface water monitoring is not required.

DRAWINGS



Groundwater level minima and maxima are controlled by medium-term trends in rainfall and are not seasonal

Line of cross section shown on Drawing 3308/ESSD/07

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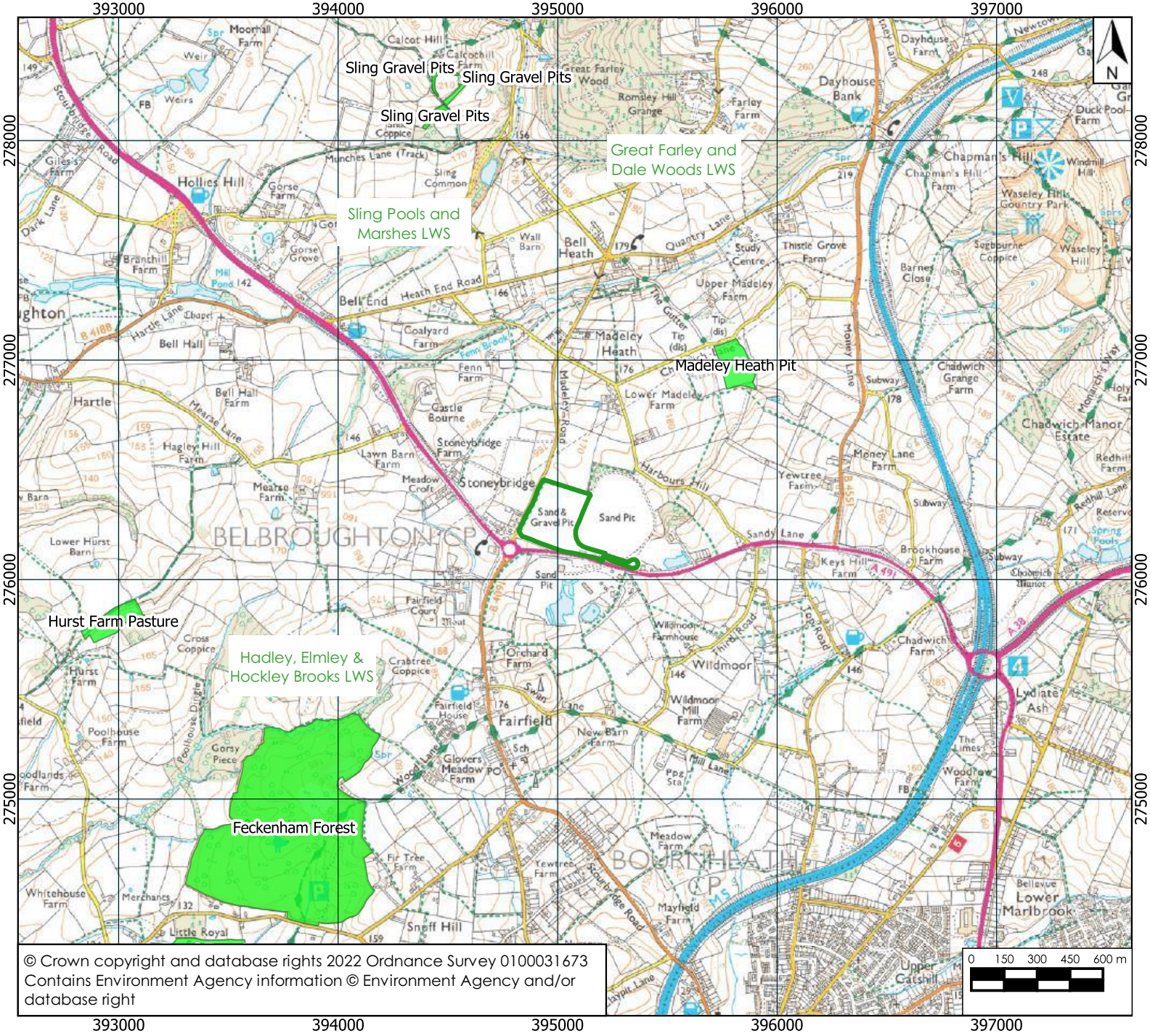
Client	NRS Bromsgrove Aggregates
Title	Conceptual model
Project	Sandy Lane Quarry
Drawing	3308/ESSD/13
Version	1
Date	Aug-22
Scale	



Legend

- Permit Boundary
- SSSI

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Habitat Sites
Project	Sandy Lane Quarry
Drawing	3308/ESSD/12
Version	1
Date	Aug 22
Scale	1:25,000

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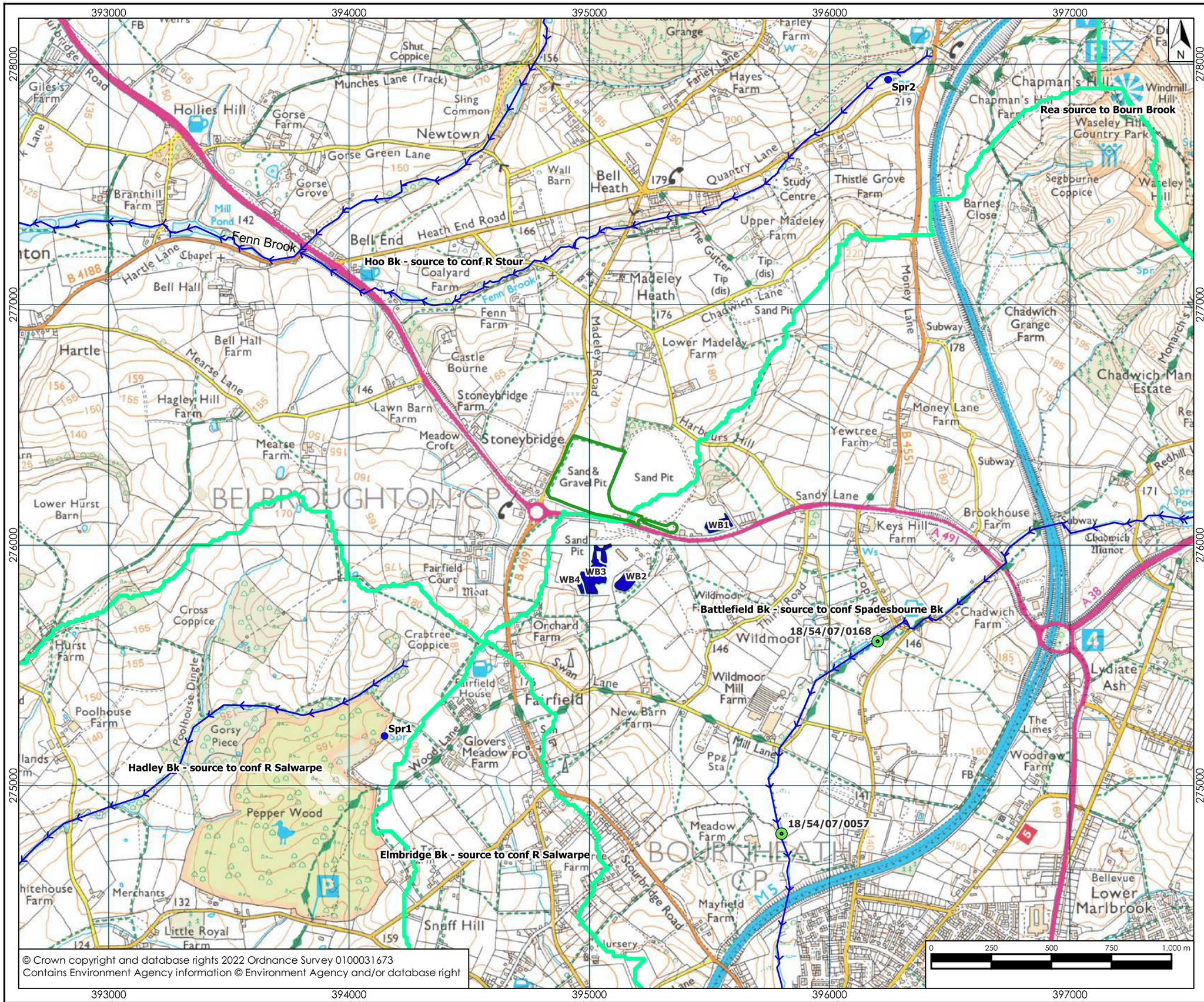

Legend

- Permit Boundary
- Watercourse
- Surface Water Catchment
- Waterbody
- Spring
- Surface Water Abstraction

Scale correct at A3

Client	NRS Bromsgrove Aggregates
Title	Regional Hydrology
Project	Sandy Lane Quarry
Drawing	3308/ESSD/11
Version	1
Date	Aug 22
Scale	1:15,000

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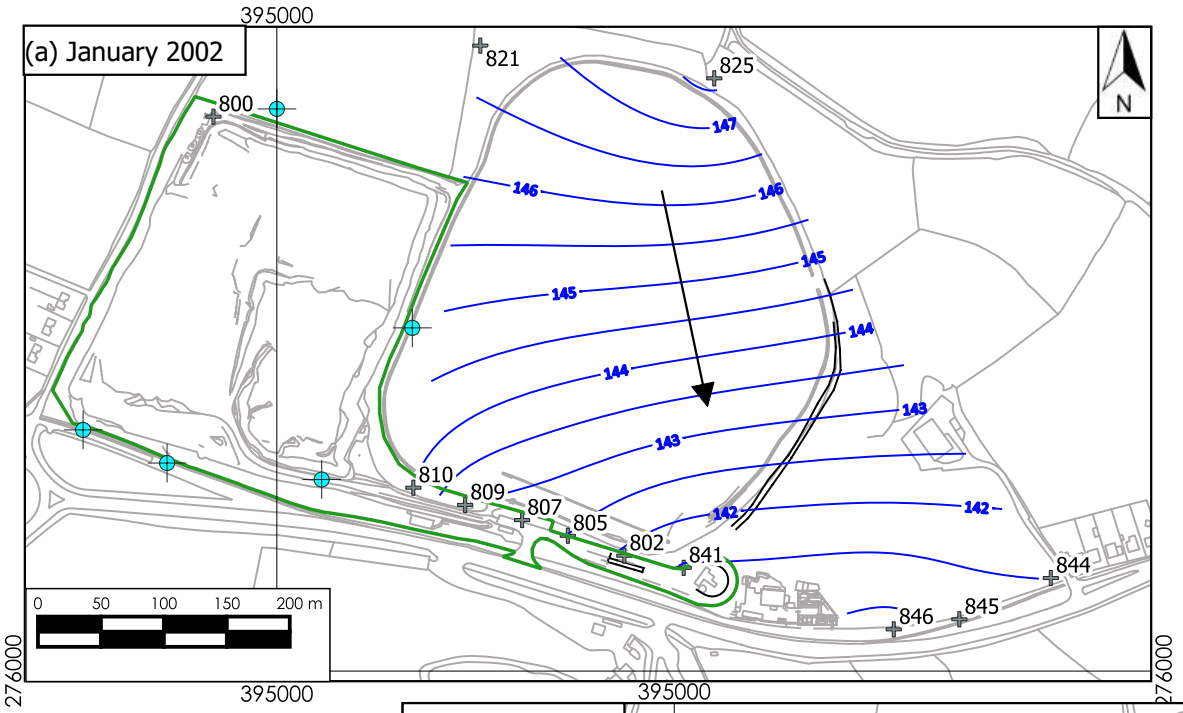

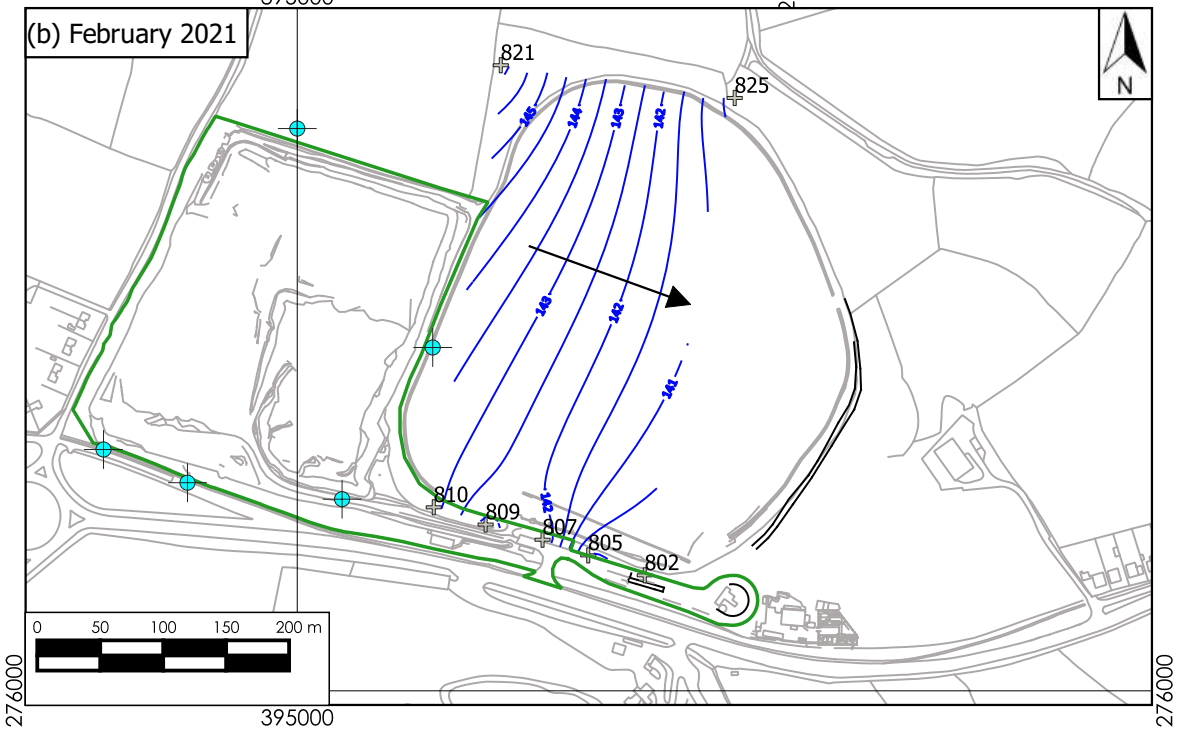

Legend

- Permit Boundary
- Groundwater Contour (m AOD)
- Monitoring Borehole
- Proposed Monitoring Borehole

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Inferred Groundwater Contours
Project	Sandy Lane Quarry
Drawing	3308/ESSD/10
Version	1
Date	Aug 2022
Scale	1:6,000

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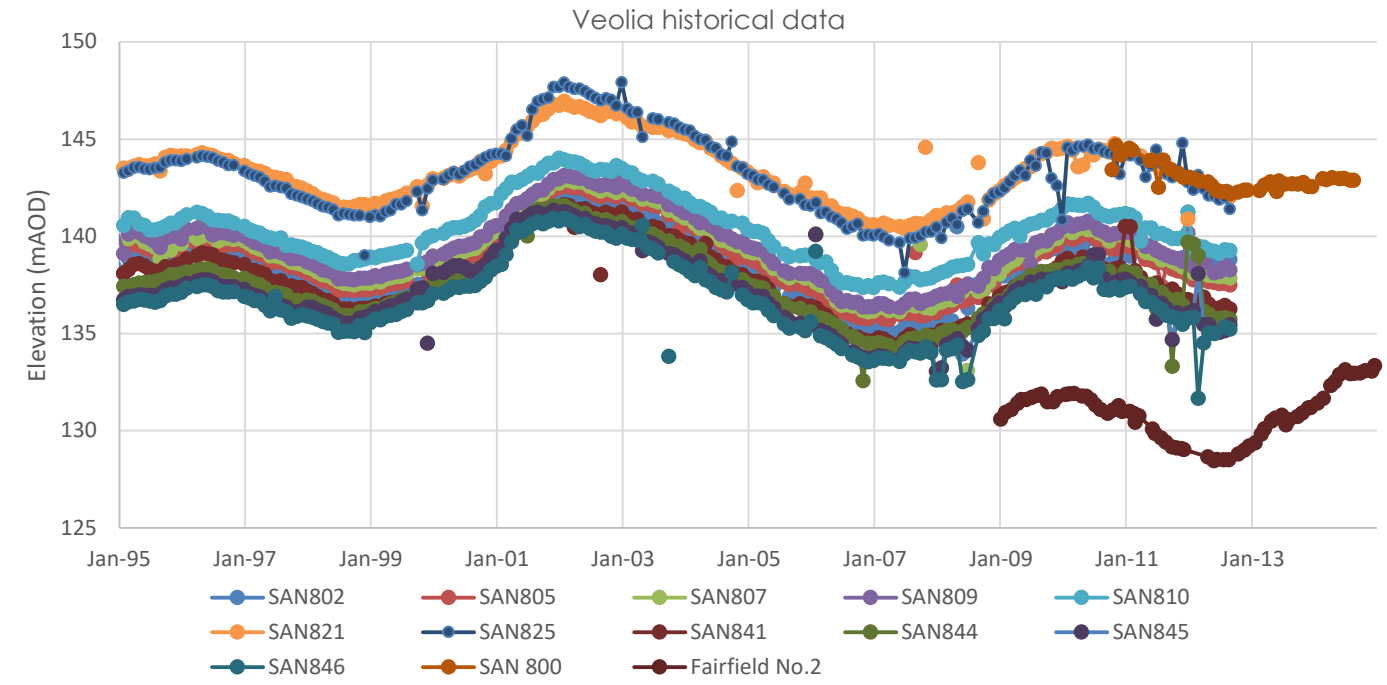

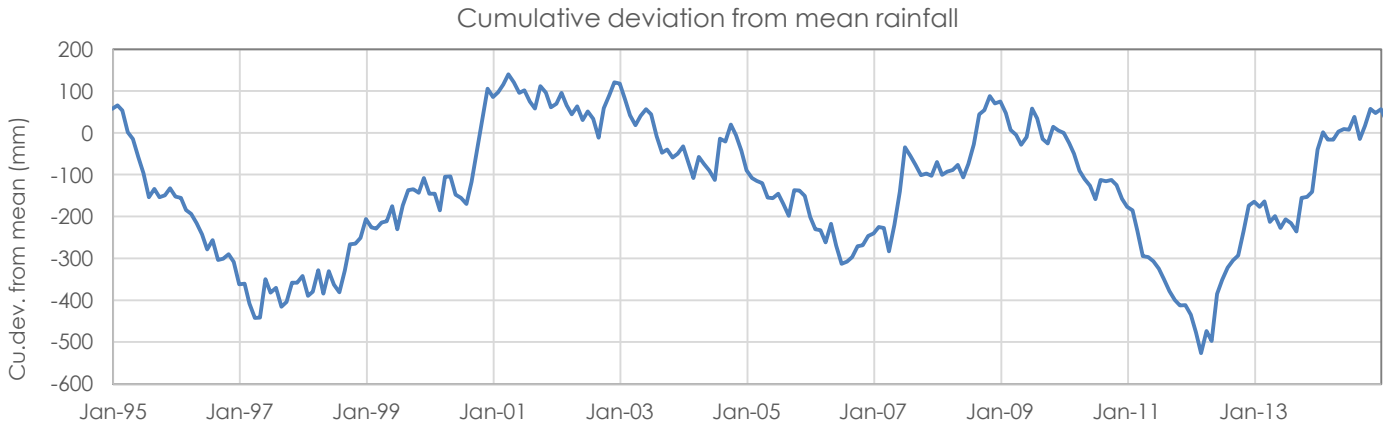

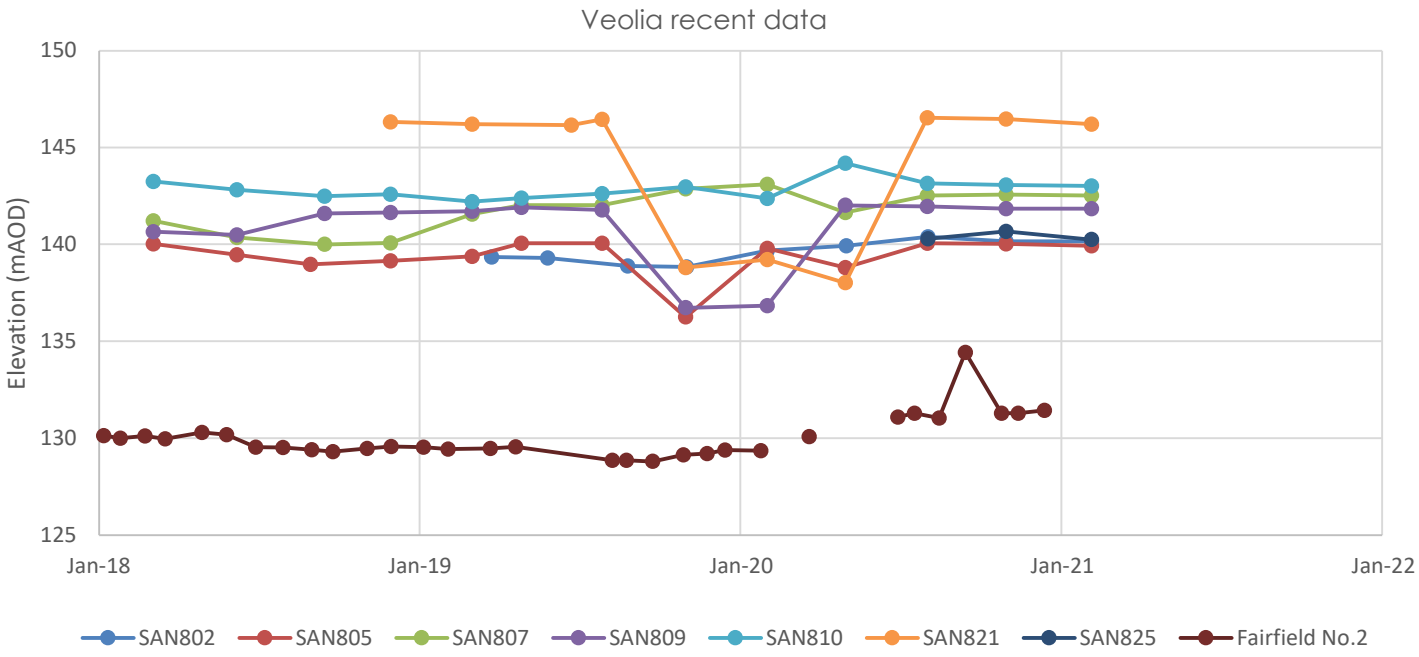

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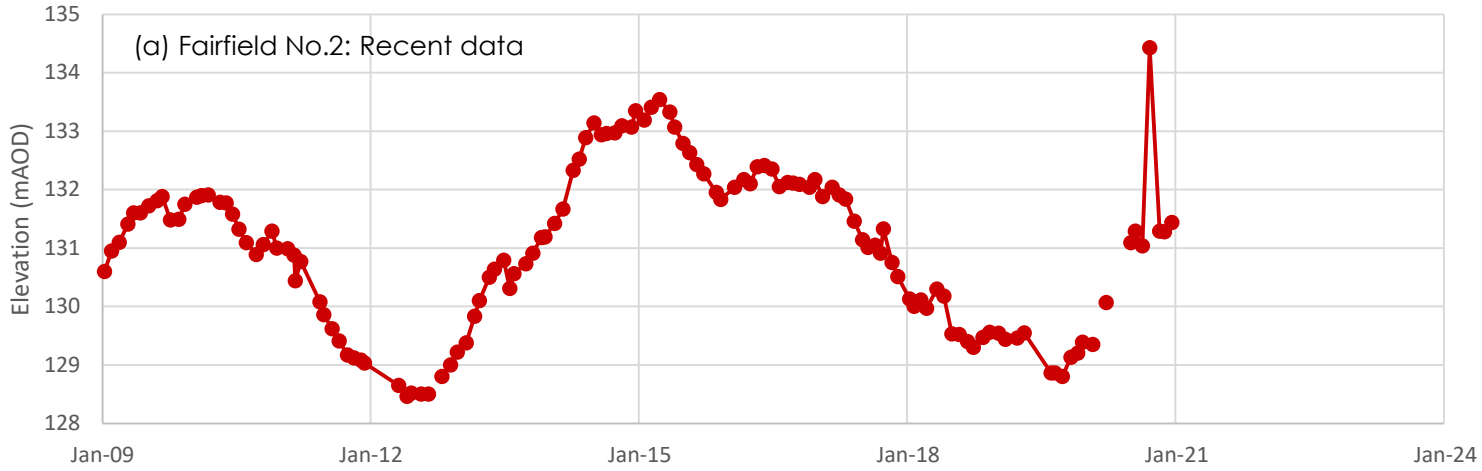
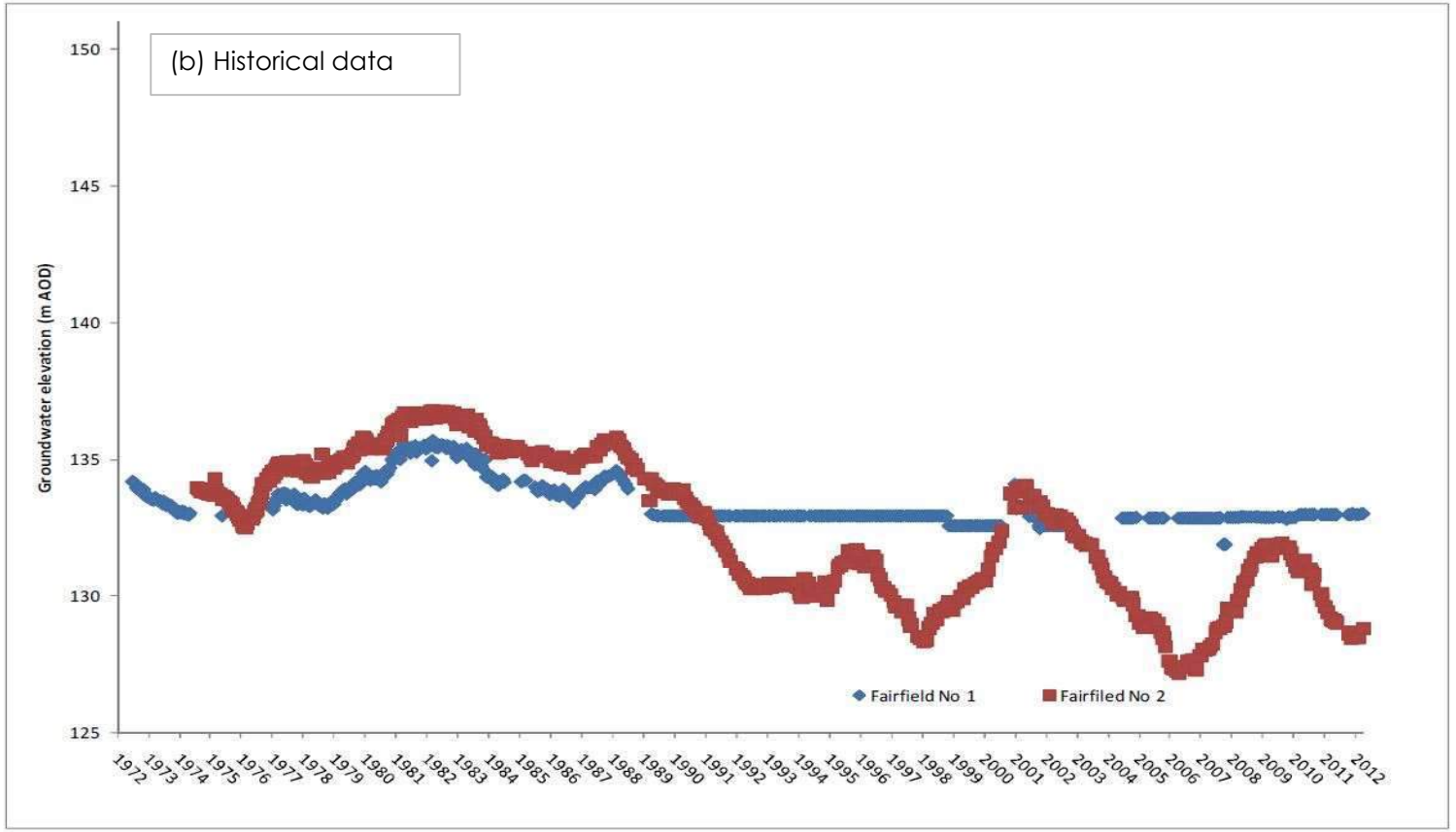
Client	NRS Bromsgrove Aggregates
Title	Hydrographs - Veolia
Project	Sandy Lane Quarry
Drawing	3308/ESSD/09
Version	1
Date	Aug-22
Scale	n/a





Client	NRS Bromsgrove Aggregates		
Title	Hydrographs - Fairfield observation borehole		
Project	Sandy Lane Quarry		
Drawing	3308/ESSD/08	Version	1
Date	Aug-22	Scale	n/a

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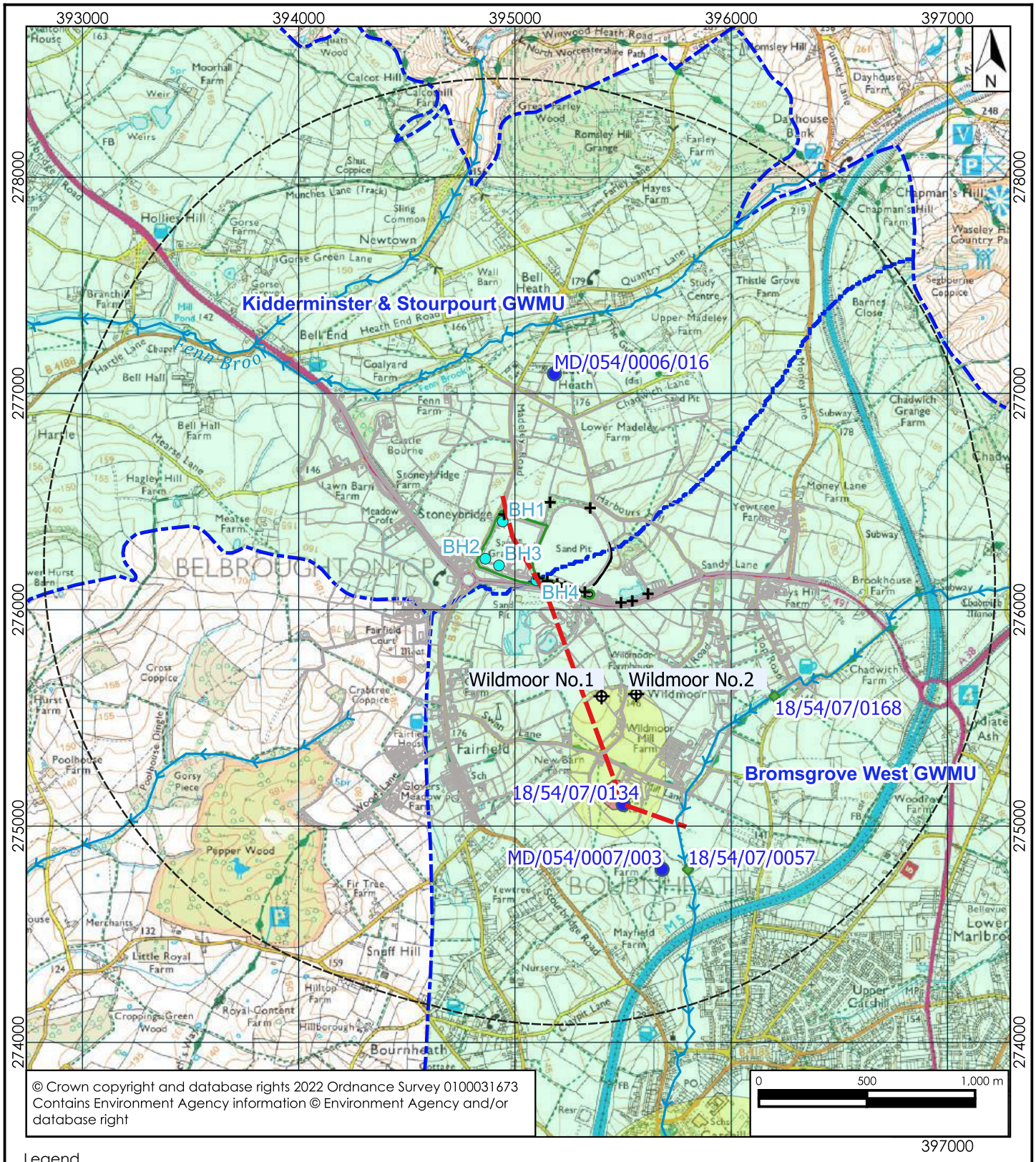

Legend

- Permit Boundary
- 2 km Radius
- Watercourse
- Line of cross section
- Groundwater Management Unit
- 2023 Groundwater monitoring boreholes

Monitoring boreholes
- EA
- Veolia

Abstractions
- Groundwater
- Surface Water

SPZ
- Zone 1
- Zone 2
- Zone 3

Scale correct at A4

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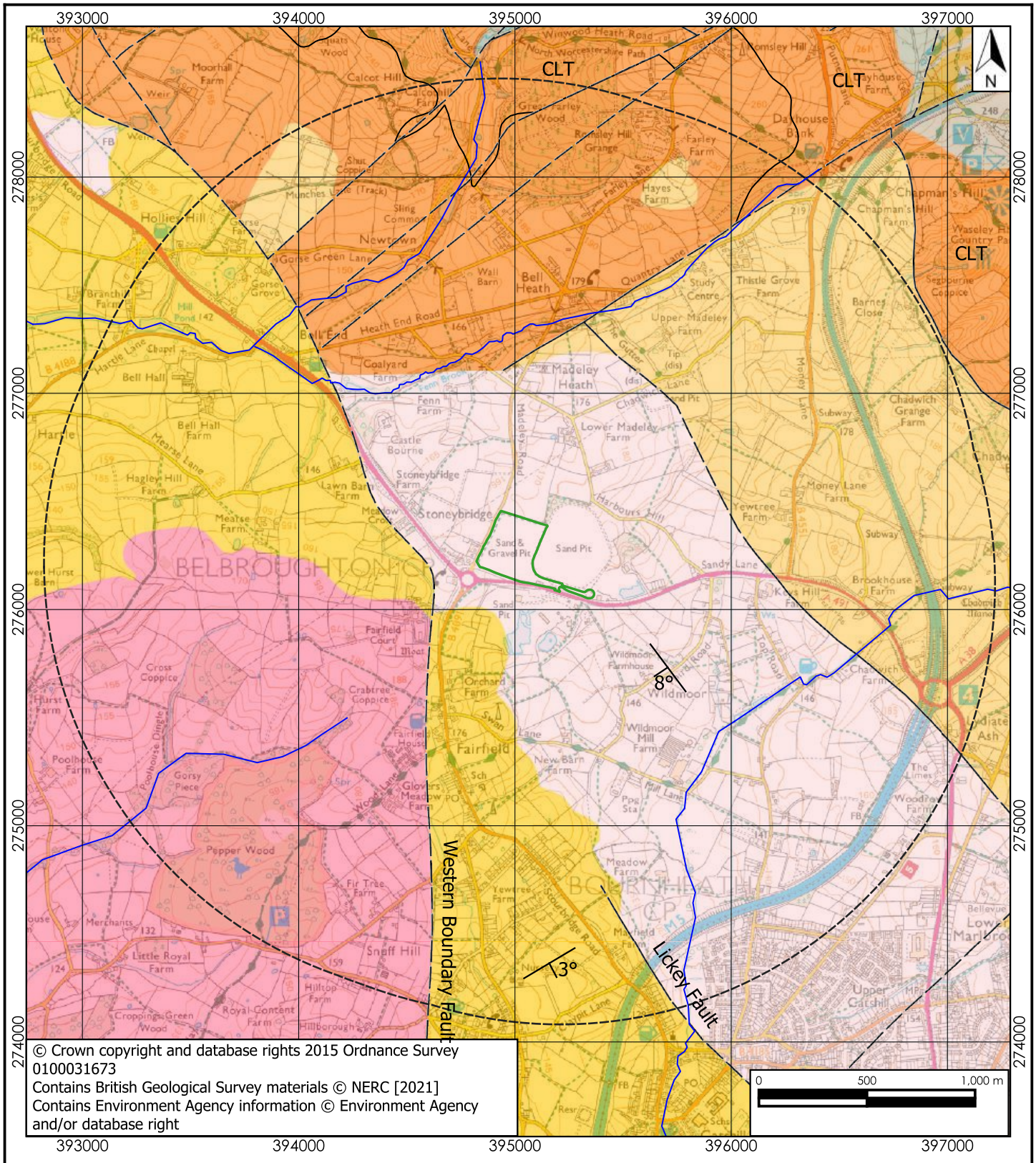
Client	NRS Bromsgrove Aggregates	Title	Regional Hydrogeology
		Project	Sandy Lane
		Drawing	3308/ESSD/07
		Version	2
		Date	Jun 2024
		Scale	1:25,000



Legend

- Permit Boundary
- Buffer 2 km
- Watercourses Clipped
- Key to geology structure

Sandy Lane Key to Bedrock geology

- Sidmouth Mudstone Formation
- Wildmoor Sandstone Member
- Helsby Sandstone Formation
- Chester Formation
- Chester Formation (conglomerate)
- Clent Formation
- Alveley Member

Scale correct at A4

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Client	NRS Bromsgrove Aggregates		
Title	Regional Geology		
Project	Sandy Lane		
Drawing	3308/ESSD/06	Version	1
Date	Aug 2022	Scale	1:25,000

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Concept Restoration Scheme
Project	Sandy Lane Quarry
Drawing	3308/ESSD/05
Version	1
Date	Aug 22
Scale	1:4,000

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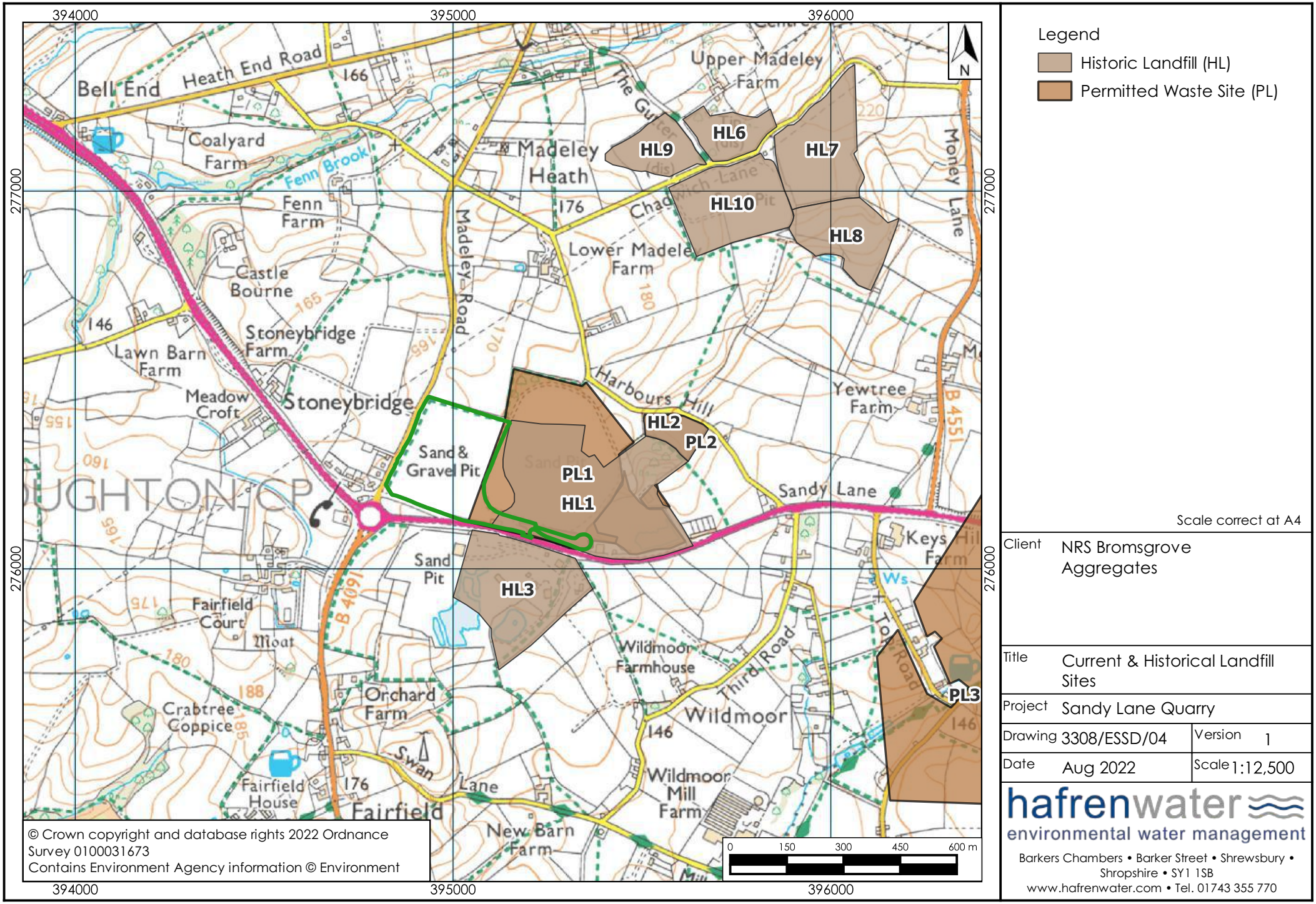

Legend

- Historic Landfill (HL)
- Permitted Waste Site (PL)

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Current & Historical Landfill Sites
Project	Sandy Lane Quarry
Drawing	3308/ESSD/04
Version	1
Date	Aug 2022
Scale	1:12,500

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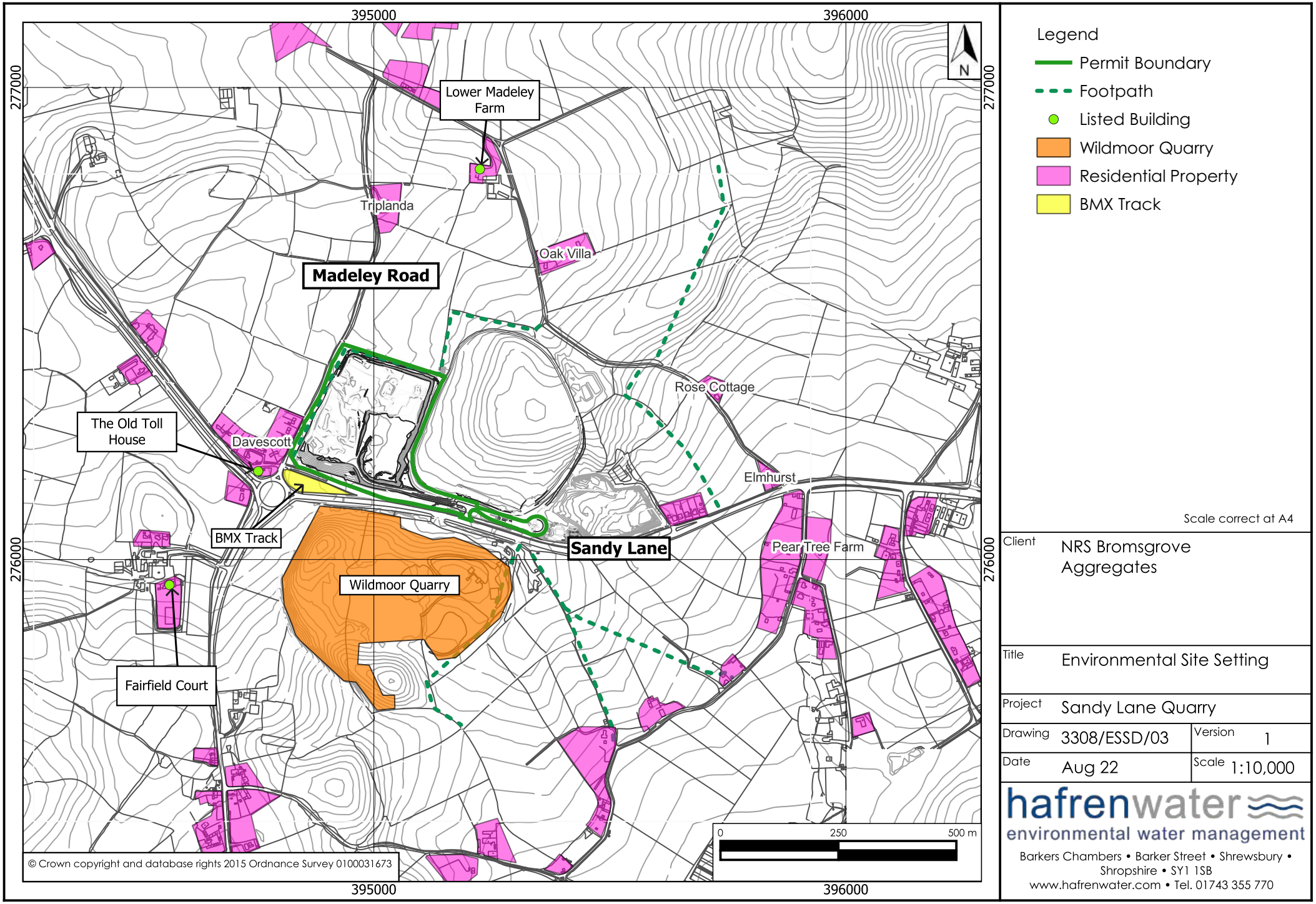

Legend

- Permit Boundary
- Footpath
- Listed Building
- Wildmoor Quarry
- Residential Property
- BMX Track

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Environmental Site Setting
Project	Sandy Lane Quarry
Drawing	3308/ESSD/03
Version	1
Date	Aug 22
Scale	1:10,000

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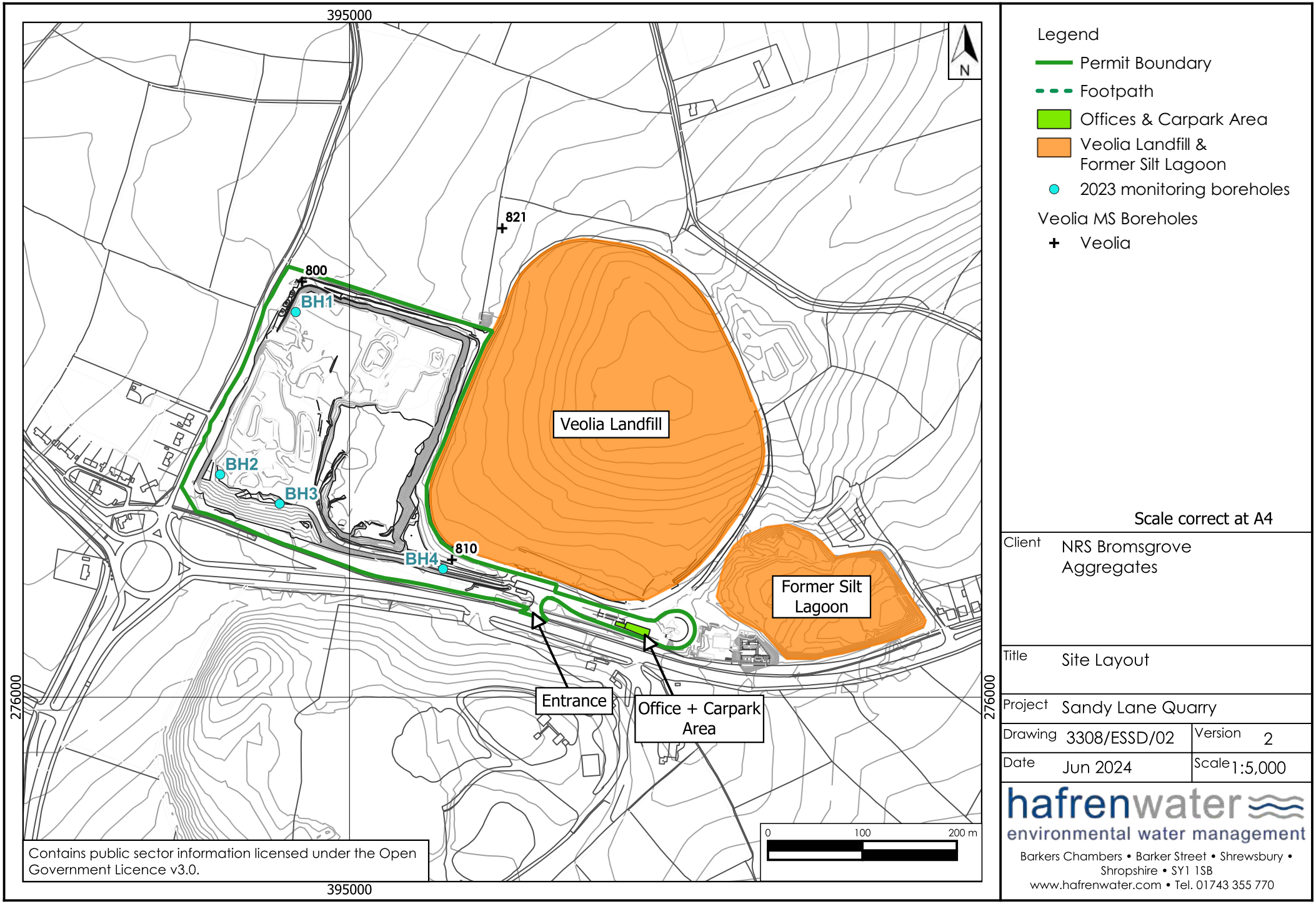

Legend

- Permit Boundary
- Footpath
- Offices & Carpark Area
- Veolia Landfill & Former Silt Lagoon
- 2023 monitoring boreholes

Veolia MS Boreholes

- Veolia

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Site Layout
Project	Sandy Lane Quarry
Drawing	3308/ESSD/02
Version	2
Date	Jun 2024
Scale	1:5,000

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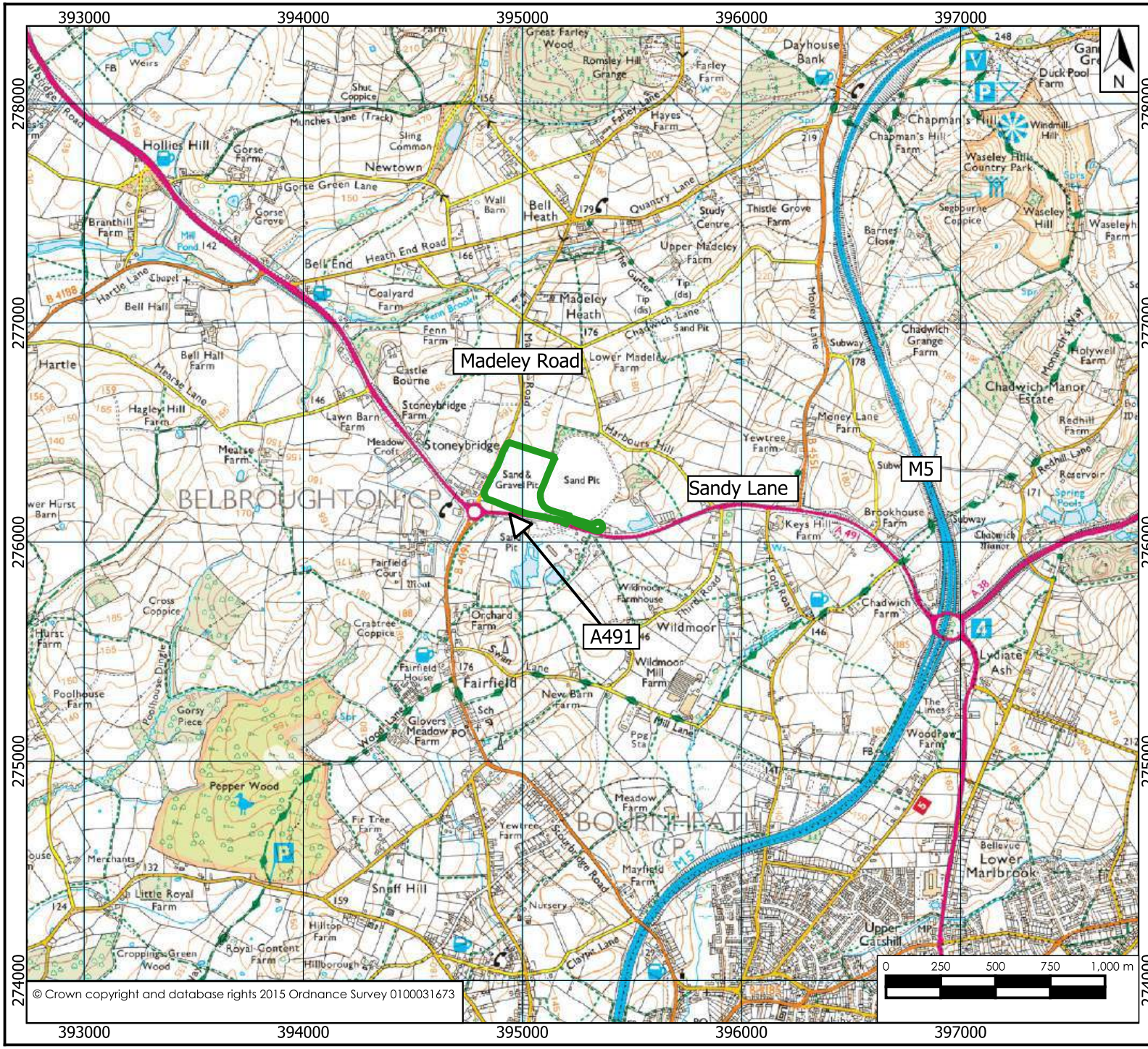

Legend

Permit Boundary

Scale correct at A4

Client	NRS Bromsgrove Aggregates
Title	Site Location
Project	Sandy Lane Quarry
Drawing	3308/ESSD/01
Version	1
Date	Aug 22
Scale	1:25,000

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APPENDIX 3308/ESSD/A1

Groundwater level data

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GROUNDWATER LEVEL MONITORING RESULTS

Site: **Sandy Lane**

Client: **NRS Bromsgrove Aggregares Ltd**

Agent **Westbury Environmental ltd**

Piezometer ID:-	BH1		BH2		BH3		BH4		Comments
Cap A.O.D.:-	10.00		10.00		10.00		10.00		
Ground level m AOD	160.00		156.00		158.00		166.50		Environarm
Bottom elevation m AOD	138.00		142.00		142.00		132.50		
Ground level LiDAR (m ADO)	159.55		151.71		156.82		166.28		
Grid Reference									
Pipe Size:-	50mm		50mm		50mm		50mm		
Response zone	7 to 22 m bgl		7 to 16 m bgl		7 to 16 m bgl		9 to 34 m bgl		
Groundwater level	m bgl	m AOD	m bgl	m AOD	m bgl	m AOD	m bgl	m AOD	
Date									
26-07-2023	11.02	148.98	7.28	148.72	9.61	148.39	18.50	148.00	
24-10-2023	8.42	151.58	5.21	150.79	9.60	148.40	20.60	145.90	
06-06-2024	11.43	148.57	2.80	153.20	6.97	151.03	23.92	142.58	
25-07-2024	11.80	148.20	5.11	150.89	5.11	150.89	23.54	141.96	
28-08-2024	10.43	149.57	5.02	150.98	5.02	150.98	23.92	142.58	
12-09-2024	11.05	148.95	5.90	150.10	5.90	150.10	24.33	142.17	
21-10-2024	10.72	149.28	5.30	150.70	5.30	150.70	24.09	142.41	
02-12-2024	10.82	149.18	5.23	150.77	5.23	150.77	23.57	142.93	
16-12-2024	10.75	149.25	5.20	150.80	5.20	150.80	23.49	143.01	
03-02-2025	10.62	149.38	5.13	150.87	5.98	152.02	23.26	143.24	

APPENDIX 3308/ESSD/A2

Groundwater quality data

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS

Site: **Sandy Lane**
Client: **NRS Bromsgrove Aggregares Ltd**
Agent **Westbury Environmental ltd**

Piezometer ID:-		UK DWS	BH1	BH1	BH1	BH1	BH1	BH1	BH1	BH1	BH1
Date			26-07-2023	24-10-2023	04-06-2024	26-07-2024	29-08-2024	13-09-2024	23-10-2024	17-12-2024	04-02-2024
Parameter	**Units**										
pH		9.5 - 6.5	6.60	7.10	7.40	7.20	7.00	7.10	6.80	6.80	6.70
Electrical conductivity	µS/cm	2500	1140	1140	1290	1275	1470	1480	1460	1390	1400
Alkalinity as CaCO3	mg/l		62	91	161	168	139	141	142	154	161
Ammoniacal nitrogen as N	mg/l		0.06	0.41	0.41	0.06	0.08	0.06	0.06	0.06	0.06
Ammonium an NH4	mg/l	0.50	0.08		0.08						
Chloride as Cl	mg/l	250	275	280	305	290.00	370.00	378.00	373.00	362.00	352
COD (Total)	mg/l		24	137	135	128.00	18.00	25.00	14.00	12.00	13
Sulphate as SO4	mg/l	250	52.1	54.5	53.7	51.70	51.90	50.80	52.30	55.90	57.2
Arsenic total	mg/l	0.01	0.00027	0.00040	0.00030	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium total	mg/l	0.005	0.00020	0.00026	0.00008	0.00	0.00	0.00	0.00	0.00	0.00015
Calcium total	mg/l		120	140	161	154.00	158.00	170.00	138.00	123.00	130
Chromium total	mg/l	0.05	0.00073	0.00071	0.00051	0.00	0.00	0.00	0.00	0.00	0.000051
Copper total	mg/l	2	0.0054	0.015	0.0029	0.00	0.00	0.00	0.00	0.00	0.0018
Iron total	mg/l	0.2	0.079	0.091	0.025	0.03	0.03	0.14	0.05	0.04	0.049
Lead total	mg/l	0.01	0.0005	0.0007	0.0003	0.00	0.00	0.00	0.00	0.00	0.0003
Magnesium total	mg/l		20.00	21.00	49.10	15.70	19.50	20.50	17.10	15.00	16.1
Manganese total	mg/l	0.05	0.15	0.21	0.11	0.13	0.01	0.01	0.01	0.01	0.0076
Mercury	mg/l	0.001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Nickel total	mg/l	0.02	0.018	0.018	0.007	0.08	0.00	0.00	0.00	0.00	0.0052
Potassium total	mg/l		10.00	10.00	8.73	8.02	10.40	12.00	9.43	8.80	8.2
Sodium total	mg/l	200	68.00	72.00	92.60	82.40	150.00	157.00	136.00	125.00	120
Zinc total	mg/l		0.091	0.17	0.091	0.10	0.02	0.02	0.03	0.03	0.038
Benzene	µg/l	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ethyl benzene	µg/l		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EH >C6 - C40	µg/l		11.00	29.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C6 - C8	µg/l		10.00	10.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C8- C10	µg/l		10.00	10.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C16 - C24	µg/l		10.00	10.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C24 - C40	µg/l		11.00	10.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C10 C16	µg/l		10.00	29.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00
Trichloroethene	µg/l		0.10	0.10	0.10	0.10		0.10	0.10	0.10	0.10
Toluene	µg/l		0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.10
m&p Xylene	µg/l		0.20	0.20	0.20	2.00	0.10	0.20	0.20	0.20	0.20
o-xylene	µg/l		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Xylenes	µg/l		0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20
Naphthalene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Acenaphthylene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Acenaphthene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Fluorene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Phenanthrene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Anthracene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Fluoanthene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Pyrene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(a)anthracene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Chrysene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(b)fluoranthene	µg/l	*	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(k)fluoranthene	µg/l	*	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(a)pyrene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
indeno(123cd)pyrene	µg/l	*	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Dienzo(ah)anthrcene	µg/l		0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(ghi)perylene	µg/l	*	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
PAH total 16	µg/l	0.1	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100

Piezometer ID:-	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2
Date	26-07-2023	24-10-2023	04-06-2024	26-07-2024	29-08-2024	13-09-2024	23-10-2024	17-12-2024	04-02-2024
Parameter									
pH	6.10	6.40	6.70	6.7	6.7	6.7	6.5	6.9	6.8
Electrical conductivity	1090	1070	972	970	949	960	955	995	989
Alkalinity as CaCO3	61.80	52.20	155	152.0	156.0	161	167.0	174	181.0
Ammoniacal nitrogen as N	0.06	0.41	0.41	0.06	0.08	0.070	0.09	0.08	0.07
Ammonium an NH4	0.08		0.08						
Chloride as Cl	192	190	129	123	130	131	130	132	137
COD (Total)	132.0	166.0	25.0	24.0	15.0	11.0	18.0	16.0	15.5
Sulphate as SO4	41.10	42.70	33.50	33.7	34.3	33.3	35.4	34.8	36.5
Arsenic total	0.00070	0.00081	0.00067	0.00064	0.00072	0.00073	0.00069	0.00057	0.00048
Cadmium total	0.00610	0.00470	0.00425	0.00451	0.00347	0.00352	0.00330	0.0031	0.00308
Calcium total	75.4	85.0	118.0	115	130	125	120	111	117
Chromium total	0.0016	0.0014	0.0005	0.00051	0.00060	0.00051	0.00051	0.00051	0.00051
Copper total	0.0170	0.200	0.002	0.0024	0.0026	0.0030	0.0027	0.0024	0.0029
Iron total	0.159	0.222	0.028	0.027	0.028	0.059	0.050	0.055	0.043
Lead total	0.0008	0.0010	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003
Magnesium total	22	22	15.2	12.4	15.2	15.3	14.8	13.6	12.7
Manganese total	1.60	1.60	0.73	0.7333	0.261	0.358	0.397	0.329	0.334
Mercury	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Nickel total	0.068	0.066	0.038	0.035	0.036	0.033	0.03	0.032	0.028
Potassium total	7.70	8.00	6.99	7.01	7.34	7.78	7.39	6.92	7.02
Sodium total	110	110	75	73.1	75.7	75.9	73.5	75.6	81.2
Zinc total	0.150	0.20	0.06	0.065	0.035	0.034	0.037	0.031	0.028
Benzene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.50
Ethyl benzene	0.10	0.10	0.10	0.50	0.10	0.10	0.10	0.50	0.50
EH >C6 - C40	12.00	17.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C6 - C8	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C8- C10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C16 - C24	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C24 - C40	12.00	17.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C10 C16	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Trichloroethene	0.10	0.10	0.10	0.10		0.10	0.10	0.50	0.50
Toluene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.50
m&p Xylene	0.20	0.20	0.20	2.00	0.20	0.20	0.20	1.00	1.00
o-xylene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.50
Total Xylenes	0.20	0.20	0.20	2.00	0.20	0.20	0.20	1.00	1.00
Naphthalene	0.26	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Acenaphthylene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Acenaphthene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Fluorene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Phenanthrene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Anthracene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Fluoanthene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Pyrene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Benzo(a)anthracene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Chrysene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Benzo(b)fluoranthene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Benzo(k)fluoranthene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Benzo(a)pyrene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
indeno(123cd)pyrene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Dienzo(ah)anthrcene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
Benzo(ghi)perylene	0.20	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100
PAH total 16	0.26	0.01	0.01	<0.010	<0.010	<0.010	<0.010	<0.100	<0.100

Piezometer ID:-	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3
Date	26-07-2023	24-10-2023	04-06-2024	26-07-2024	29-08-2024	13-09-2024	23-10-2024	17-12-2024	04-02-2024
Parameter									
pH	6.50	6.90	6.40	6.5	6.4	6.4	6.4	6.8	6.8
Electrical conductivity	138	143	233	235	216	218	231	245	251
Alkalinity as CaCO3	54.80	58.40	76.20	71.2	71.4	77.0	83.0	92.1	88.7
Ammoniacal nitrogen as N	0.06	0.41	0.41	0.06	0.08	0.06	0.06	0.06	0.06
Ammonium an NH4	0.08		0.08						
Chloride as Cl	5.6	5.9	5.4	5.3	5.2	6.2	6.3	6.2	6.8
COD (Total)	11	11	20	19	11	11	11	11	11
Sulphate as SO4	6.70	7.50	35.0	34.6	29.6	28.5	28.6	24.8	25.7
Arsenic total	0.00068	0.00100	0.00060	0.00057	0.00064	0.00066	0.00054	0.00042	0.00038
Cadmium total	0.00018	0.00030	0.00061	0.00055	0.00051	0.00051	0.00043	0.00049	0.00052
Calcium total	21.70	23.40	35.80	36.7	32.2	34.2	31.0	30.7	34.4
Chromium total	0.0006	0.0012	0.0013	0.00051	0.00106	0.00104	0.00083	0.00075	0.00068
Copper total	0.0099	0.037	0.006	0.007	0.0055	0.0054	0.0073	0.0078	0.0083
Iron total	0.040	0.284	0.075	0.064	0.025	0.070	0.031	0.027	0.033
Lead total	0.0003	0.0012	0.0006	0.0007	0.0003	0.0004	0.0003	0.0003	0.0003
Magnesium total	2.20	2.40	6.35	6.28	6.47	6.08	5.53	4.93	5.13
Manganese total	0.11	0.12	0.05	0.0438	0.0565	0.0485	0.0377	0.0065	0.0072
Mercury	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Nickel total	0.0038	0.0047	0.0080	0.007	0.0068	0.0068	0.0061	0.0068	0.0061
Potassium total	2.10	2.20	3.77	3.66	3.63	3.73	3.42	3.48	3.38
Sodium total	3.70	3.80	9.40	9.2	8.5	8.7	9	8.8	9.5
Zinc total	0.056	0.11	0.04	0.042	0.028	0.019	0.029	0.022	0.025
Benzene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ethyl benzene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EH >C6 - C40	10.00	30.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C6 - C8	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C8- C10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C16 - C24	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C24 - C40	10.00	30.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C10 C16	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Trichloroethene	0.10	0.10	0.10	0.10		0.10	0.10	0.10	0.10
Toluene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
m&p Xylene	0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20
o-xylene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0..10
Total Xylenes	0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20
Naphthalene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Acenaphthylene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Acenaphthene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Fluorene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Phenanthrene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Anthracene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Fluoanthene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Pyrene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(a)anthracene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Chrysene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(b)fluoranthene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(k)fluoranthene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(a)pyrene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
indeno(123cd)pyrene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Dienzo(ah)anthrcene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
Benzo(ghi)perylene	0.01	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100
PAH total 16	0.12	0.01	0.01	<0.010	<0.010	0.01	<0.010	<0.100	<0.100

Piezometer ID:-	BH4	BH4	BH4	BH4	BH4	BH4	BH4	BH4	BH4
Date	26-07-2023	24-10-2023	06-06-2024	26-07-2024	29-08-2024	13-09-2024	23-10-2024	17-12-2024	04-02-2024
Parameter									
pH	6.50	6.90	6.60	6.5	6.5	6.8	6.5	6.9	6.8
Electrical conductivity	482	480	513	524	539	563	546	595	581
Alkalinity as CaCO3	83.60	98.80	111.00	118	125	146	155	169	163.0
Ammoniacal nitrogen as N	0.14	1.32	0.41	0.06	0.08	0.06	0.06	0.06	0.06
Ammonium an NH4	0.18		0.08						
Chloride as Cl	15.5	14.0	11.7	11.5	11.1	10.8	11.8	15.3	14
COD (Total)	11	17	12	11	11	11	18	12	13
Sulphate as SO4	150.0	151.0	151.0	147	153	150	151	148	156
Arsenic total	0.00110	0.00051	0.00029	0.00024	0.00033	0.00035	0.00031	0.00033	0.00041
Cadmium total	0.00047	0.00036	0.00020	0.00055	0.00013	0.00009	0.00007	0.00007	0.00007
Calcium total	66.70	73.30	78.10	75.4	89.2	98.2	90.4	92.5	87.9
Chromium total	0.0041	0.0011	0.0005	0.00051	0.00051	0.00163	0.00051	0.00059	0.00065
Copper total	0.0500	0.015	0.002	0.0026	0.0024	0.0018	0.0018	0.0018	0.0018
Iron total	2.700	0.393	0.036	0.035	0.025	0.063	0.067	0.063	0.056
Lead total	0.0110	0.0021	0.0004	0.0004	0.0003	0.0004	0.0003	0.0006	0.0007
Magnesium total	9.60	9.10	8.92	8.82	10.5	10.1	9.53	9.54	8.89
Manganese total	0.39	0.24	0.01	0.0144	0.0134	0.0131	0.0048	0.0067	0.0071
Mercury	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Nickel total	0.0170	0.0086	0.0037	0.026	0.0033	0.0028	0.0024	0.0017	0.0012
Potassium total	7.40	7.00	6.33	6.41	7.10	7.27	6.49	6.00	6.26
Sodium total	21.00	23.00	24.60	22.6	30.6	29.3	27.4	25.9	24.1
Zinc total	0.150	0.14	0.03	0.022	0.033	0.015	0.016	0.017	0.015
Benzene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ethyl benzene	0.10	0.10	0.10	1.00	0.10	0.10	0.10	0.10	0.10
EH >C6 - C40	12.00	12.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C6 - C8	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C8- C10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C16 - C24	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C24 - C40	12.00	12.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EH >C10 C16	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Trichloroethene	0.10	0.10	0.10	0.10		0.10	0.10	0.10	0.10
Toluene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
m&p Xylene	0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20
o-xylene	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Xylenes	0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20
Naphthalene	0.10	0.01	0.01	<0.010	0.01	0.01	<0.010	<0.100	<0.100
Acenaphthylene	0.10	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Acenaphthene	0.10	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Fluorene	0.10	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Phenanthrene	0.12	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Anthracene	0.10	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Fluoanthene	0.32	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Pyrene	0.34	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Benzo(a)anthracene	0.20	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Chrysene	0.25	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Benzo(b)fluoranthene	0.41	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Benzo(k)fluoranthene	0.30	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Benzo(a)pyrene	0.33	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
indeno(123cd)pyrene	0.49	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Dienzo(ah)anthrcene	0.14	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
Benzo(ghi)perylene	0.46	0.01	0.01	<0.010	0.01	<0.010	<0.010	<0.100	<0.100
PAH total 16	3.35	0.01	0.01	<0.010	0.01	0.01	<0.010	<0.100	<0.100

Parameter	Max	Mean	Min	SD	Count	Count if > LOD	Count if > DWS	Preliminary Action limit Based on mean + 2xSD	Preliminary Compliance limit Based on max conc.	Comment
pH	7.40	6.7	6.10	0.27	36		0			
Electrical conductivity	1480	770.2	138.00	442.25	36		0			
Alkalinity as CaCO3	181	120.0	52.20	42.13	36		0			
Ammoniacal nitrogen as N	1.32	0.2	0.06	0.24	36	2	0	0.41	1.32	
Ammonium an NH4	0.18	0.1	0.08	0.04	8	1	0			
Chloride as Cl	378	123.6	5.20	136.19	36		9			
COD (Total)	166	32.2	11.00	44.25	36		0			
Sulphate as SO4	156.0	66.2	6.70	50.90	36		0	79.60555556	156	
Arsenic total	0.00240	0.0	0.00	0.00	36		0			
Cadmium total	0.00610	0.0	0.00	0.00	36		1	0.0014	0.0061	
Calcium total	170.00	92.3	21.70	43.94	36		0			
Chromium total	0.00	0.0	0.00	0.00	36	16	0			
Copper total	0.20	0.0	0.00	0.03	36		0			
Iron total	2.70	0.1	0.03	0.44	36		4	0.197	2.7	
Lead total	0.01	0.0	0.00	0.00	36	14	1			
Magnesium total	49.10	13.0	2.20	8.35	36		0			
Manganese total	1.60	0.2	0.00	0.39	36		18			
Mercury	0.00	0.0	0.00	0.00	36	0	0			
Nickel total	0.08	0.0	0.00	0.02	36		11			
Potassium total	12.00	6.7	2.10	2.39	36		0			
Sodium total	157.00	57.0	3.70	46.20	36		0			
Zinc total	0.20	0.1	0.02	0.05	36		0			
Benzene	0.50	0.1	0.10	0.09	36	2	0			
Ethyl benzene	1.00	0.2	0.10	0.18	36	3	0			
EH >C6 - C40	30.00	11.8	10.00	4.82	36	7	0			
EH >C6 - C8	20.00	10.3	10.00	1.67	36	0	0			
EH >C8- C10	20.00	10.3	10.00	1.67	36	0	0			
EH >C16 - C24	20.00	10.3	10.00	1.67	36	0	0			
EH >C24 - C40	30.00	11.2	10.00	3.81	36	6	0			
EH >C10 C16	29.00	10.8	10.00	3.54	36	1	0			
Trichloroethene	0.50	0.1	0.10	0.10	32	2	0			
Toluene	0.50	0.1	0.10	0.09	36	3	0			
m&p Xylene	2.00	0.4	0.10	0.59	36	5	0			
o-xylene	0.50	0.1	0.10	0.09	35	2	0			
Total Xylenes	2.00	0.4	0.20	0.59	36	5	0			
Naphthalene	0.26	0.0	0.01	0.07	16	1	0			
Acenaphthylene	0.20	0.0	0.01	0.05	15	0	0			
Acenaphthene	0.20	0.0	0.01	0.05	15	0	0			
Fluorene	0.20	0.0	0.01	0.05	15	0	0			
Phenanthrene	0.20	0.0	0.01	0.05	15	1	0			
Anthracene	0.20	0.0	0.01	0.05	15	0	0			
Fluoanthene	0.32	0.0	0.01	0.09	15	2	0			
Pyrene	0.34	0.0	0.01	0.10	15	1	0			
Benzo(a)anthracene	0.20	0.0	0.01	0.07	15	1	0			
Chrysene	0.25	0.0	0.01	0.08	15	1	0			
Benzo(b)fluoranthene	0.41	0.0	0.01	0.11	15	1	21			
Benzo(k)fluoranthene	0.30	0.0	0.01	0.09	15	1	21			
Benzo(a)pyrene	0.33	0.0	0.01	0.09	15	1	0			
indeno(123cd)pyrene	0.49	0.1	0.01	0.13	15	1	21			
Dienzo(ah)anthrcene	0.20	0.0	0.01	0.06	15	1	0			
Benzo(ghi)perylene	0.46	0.1	0.01	0.12	15	1	21			
PAH total 16	3.35	0.2	0.01	0.83	16	3	3			

0.01 format denotes concentration below the lower detaction limit

APPENDIX 3308/ESSD/A3

Borehole construction quality assurance report

ENVIROARM LTD

SANDY LANE QUARRY

Construction Quality Assurance Validation Report
Groundwater and Gas Monitoring Boreholes

July 2023

Ref: ARM/SLQ/QA/1.00/2023

SANDY LANE QUARRY

Construction Quality Assurance Validation Report
Groundwater and Gas Monitoring Boreholes

CONTENTS

SANDY LANE QUARRY

Construction Quality Assurance Validation Report
Groundwater and Gas Monitoring Boreholes

1.1 General

Enviroarm Limited were requested by NRS Sandy Lane to carry out Construction Quality Assurance monitoring services during the installation of groundwater and gas monitoring boreholes at Sandy Lane, as per the requirements of the Construction Quality Assurance Plan, and the works were carried out under full time Construction Quality Assurance supervision.

A detailed drilling logs and photographic records were taken during the works.

The groundwater and gas monitoring boreholes were drilled and installed by Geotechnical Ltd as per the instructions issued by Enviroarm Limited. The boreholes had a minimum 4.0 metre seal of bentonite and were drilled between depths between 16 and 34 metres to ensure 5 metres penetration of the groundwater table.

The groundwater monitoring boreholes had detailed drilling logs and installation logs completed by the engineer.

The inspection and sealing works were undertaken on the 4th June and 6th July 2023. This report documents all CQA activities implemented during the drilling and construction works.

The drilling rig was demobilised and moved off site on the 6th July 2023 and allowed the boreholes to be developed.

1.2 Site Location

Sandy Lane is located within the Sandy Lane Landfill, off Sandy Lane, the A491 in Worcestershire.

1.3 Project Team

The project team comprised of:

NRS Bromsgrove Aggregates Ltd: Client/Operator

Enviroarm Ltd: CQA Engineer

Geotechnical Ltd: Specialist Drilling Contractor

1.4 Ground Conditions

The site is currently and abandoned quarry which now has planning permission to take out more sand and to infill the site with inert waste. The boreholes are dual groundwater and gas monitoring boreholes designed to allow for determination of baseline groundwater quality and soil gas background concentrations.

Plate 1: View of borehole ESID4 being drilled using PSM 166T drilling rig.

The greater part of the district is underlain by Triassic Strata belonging to the Sherwood Sandstone, Mercia Mudstone and Penarth Groups. Deposition took place under generally arid and semiarid conditions, in a low-latitude continental interior.

Most of the strata are red as a result of the diagenetic alternation of iron oxide (haematite) of detrital ferromagnesian silicates and iron bearing clay minerals, and is summarised on Geological sketch plan and British Geological Maps contained in the Hydrogeological Report.

<u>Sherwood Sandstone Group</u>

The site lies within this group. The Sherwood Sandstone Group was formally introduced for the formations that comprise the arenaceous lower part of the Triassic succession throughout Britain. This sequence was subdivided into three formations

renamed recently (Warrington et al 1980), which are the basis for this report. An additional formation, the Quartzite Breccia, which locally underlies the Kidderminster formation and is therefore included as follows:

SUBDIVISIONS OF THE SHERWOOD SANDSTONE

HULL 1869	Warrington 1980
Lower Keuper Sandstone	Bromsgrove Sandstone
Upper Mottled Sandstone	Wildmoor Sandstone
Bunter Pebble Beds	Kidderminster Formation
	Quartzite Breccia

Deposition of the Sherwood Sandstone Group was controlled by palaegeographical changes initiated during the Permian. A series of troughs and ridges were formed, orientated roughly north-south in response to east west tensional stresses in the region of the North Atlantic. One such trough was the Worcester Basin.

The down-warping of the Worcester Basin resulted in a river system bringing detritus from as far south as Brittany. The lower fluvial part of the Kidderminster Formation is restricted to the Basin area, while the Quartzite Breccia formed as a scree deposit on the eastern flank. This ridge was soon inundated by the upper part of the Kidderminster formation. The Sherwood Sandstone Group is about 700m thick in the west of the district.

Wildmoor Sandstone

The name Wildmoor Sandstone was introduced for beds formerly termed Upper Mottled Sandstone. This formation consists predominantly of sandstone and provides the well-known moulding sands quarried around Wildmoor. The Wildmoor Sandstone is dominated by remarkably uniform, very weakly cemented, fine grained, silty, micaceous sandstone. The formation includes upward fining rhythms which commence with a medium too coarse grained or pebbly sandstone and pass upwards through cross-bedded, fine grained sandstones into plainer bedded fine-grained sandstones and mudstones. The Wildmoor Sandstone rests conformably upon the Kidderminster Formation from which it is distinguished by its fine grain and foxy red colouration.

Chester Formation

This name was introduced (Warrington et al, 1980) for the succession of sandstones with subordinate siltstones and mudstones is comparatively fossiliferous. There are three distinct

lithologies formalised as the Burcot, Finstall and Sugarbrook members of the formation.

The formation comprises a sequence of upward fining sedimentary cycles.in the lower part of the formation they consist of coarse sandstones with a basal conglomerate or breccia bed. Grain size reduces upwards through the formation and siltstones and mudstones become more common.

The site exposure is that of the Burcot Member which are structureless red-brown sandstones and include only minor beds of siltstone and mudstone.

Structure

The site sits between two structural areas; the Worcester Basin and the Lickey Ridge. The Worcester Basin is a major Triassic basin, floored by Precambrian and Lower Palaeozoic rocks, its eastern end bounded by the Lickey End Fault, this is to the west of the site. The Lickey End Fault continues north west to join the Western Boundary Fault of the South Staffordshire Coalfield.

The site is bound on the east by the Longbridge fault which runs north south.

The strata dip south westerly where it and the Lickey End Fault becomes the Inkberrow Fault, which continues down to the Haselor Hill Fault outside Evesham.

Local Geology

The Chadwich Lane Quarry is located in sands of the Wildmoor Sandstone. The quarry consists of a uniform, brownish red sandstone. The sandstone is medium too coarse grained, micaceous and feldspathic. Cross bedding has been observed which suggests fluvial deposition.

The strata dips south easterly. The local strata dips at approximately 7º.

The local geology is also presented at Figure 1 for reference below showing the position of the fault in the quarry.

Figure 1: Bedrock Geology

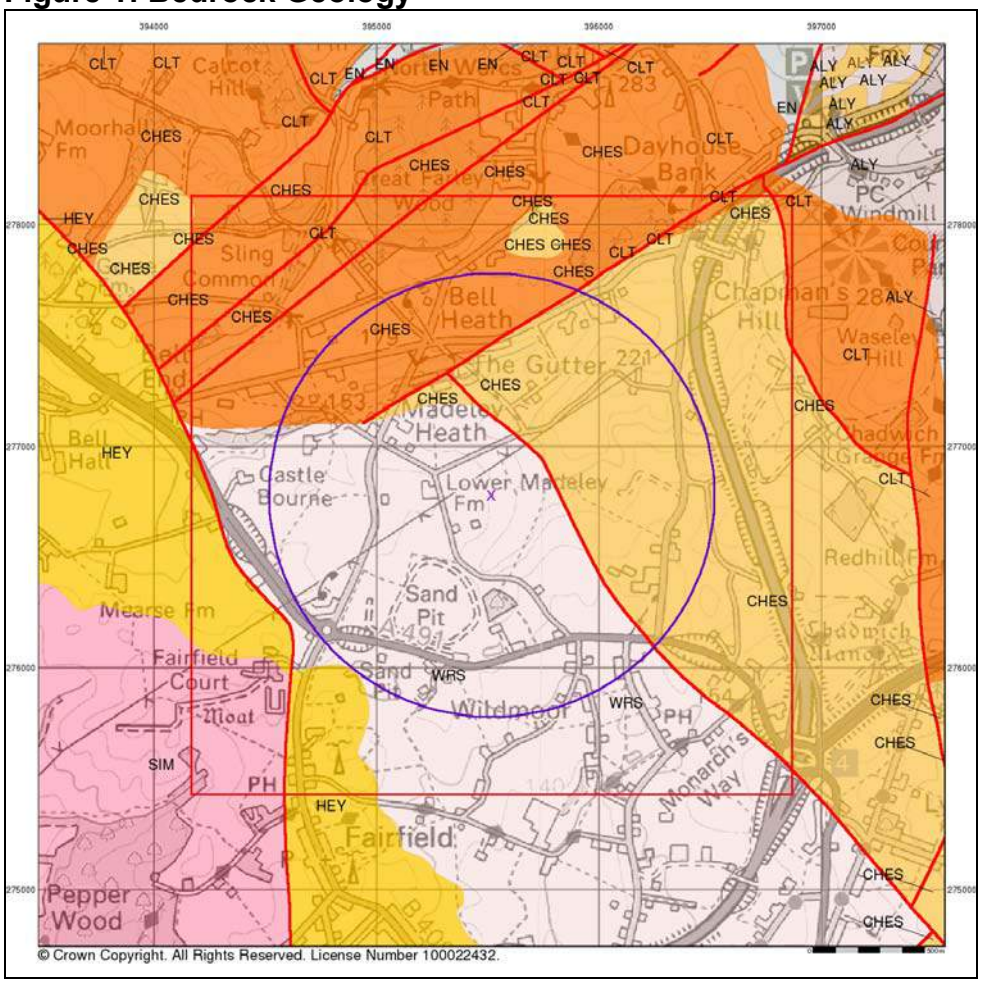


Figure 2 shows the site to consist of Wildmoor Sandstone.

The site is not located within a Source Protection Zone.

The site is absent of superficial deposits and the current workings are bound by faults to the east and west of the void.

1.5 Groundwater and Gas Borehole Installations

The groundwater monitoring boreholes All of the boreholes intercepted the Wildmoor Sandstone and groundwater within the bedrock geology.

On completion of the boreholes the pipes were installed supplied by Boode UK Ltd. Product description and delivery notes and MQA specification are presented at Appendix B. The internal diameter of the pipe was 50mm and has 1mm slots, see Plate 2.

The gravel was a 10mm clean pea gravel that was fines free supplied by Wildmoor Quarry.

Depth of gravel was checked using a dip tape to ensure that the screened sections were covered.

1.6 Sealing Works

The material used for the sealing works was a bentonite grout mix, which was wetted up in the hole to ensure full hydration of the bentonite.

The bentonite used for all sealing was Mikolit 300..

Sealing works were carried out in accordance with the CQA Plan procedures.

On completion of borehole a metal head cover was installed which were secured using Cemex Premium Portland limestone cement supplied in accordance with BS EN 197-1.

Plate 2: Water and casing/screen used.

1.7 Observations

The groundwater and gas monitoring boreholes had perforated, and solid pipe installed as per the Construction Quality Assurance Plan prepared by Enviroarm Ltd as seen in Plate 2 above, and were drilled 5 metres into the groundwater, as shown at Plate 3.

The drilling of the boreholes was carried out using a PSM 166T rig, the specification is presented at Appendix B drilling rig.

Installation details for each borehole are presented at Appendix A.

Plate 3: Groundwater table intercepted at borehole BH3

A daily log sheet was completed by the engineer and is presented at Appendix A. Appendix B includes drill log prepared by the driller and Appendix C contains the CQA drill log prepared by the CQA Engineer based on the drill returns discharged from the borehole with the air flush returns.

Clean pea gravel was supplied from Wildmoor Quarry.

Each borehole had an end cap at the base and a gas valve at the top. Each borehole had head works.

1.8 CONCLUSIONS

The groundwater and gas monitoring boreholes have been installed at the locations shown on Drawing SLQ/ESSD/BH1. The groundwater and gas monitoring boreholes have been constructed in accordance with the Construction Quality Assurance Plan prepared by Enviroarm Limited and have been drilled at least five metres into the groundwater.

The new groundwater and gas monitoring boreholes were drilled on between the 4th and 6th of July 2023 and purged and flushed on the 6th July to allow for groundwater development and are now fit for

purpose and the boreholes have been sealed in accordance with the Construction Quality Assurance Plan.

Table 1: New borehole locations

BH No	BH Elevation (m AOD)	Easting	Northing	Ground Level (m AOD)	Basal Level of BH (m)
BH1	160	394943	276408	160	138
BH2	156	394863	276236	156	142
BH3	158	394926	276205	158	142
BH4	166.5	395099	276136	166.50	132.5

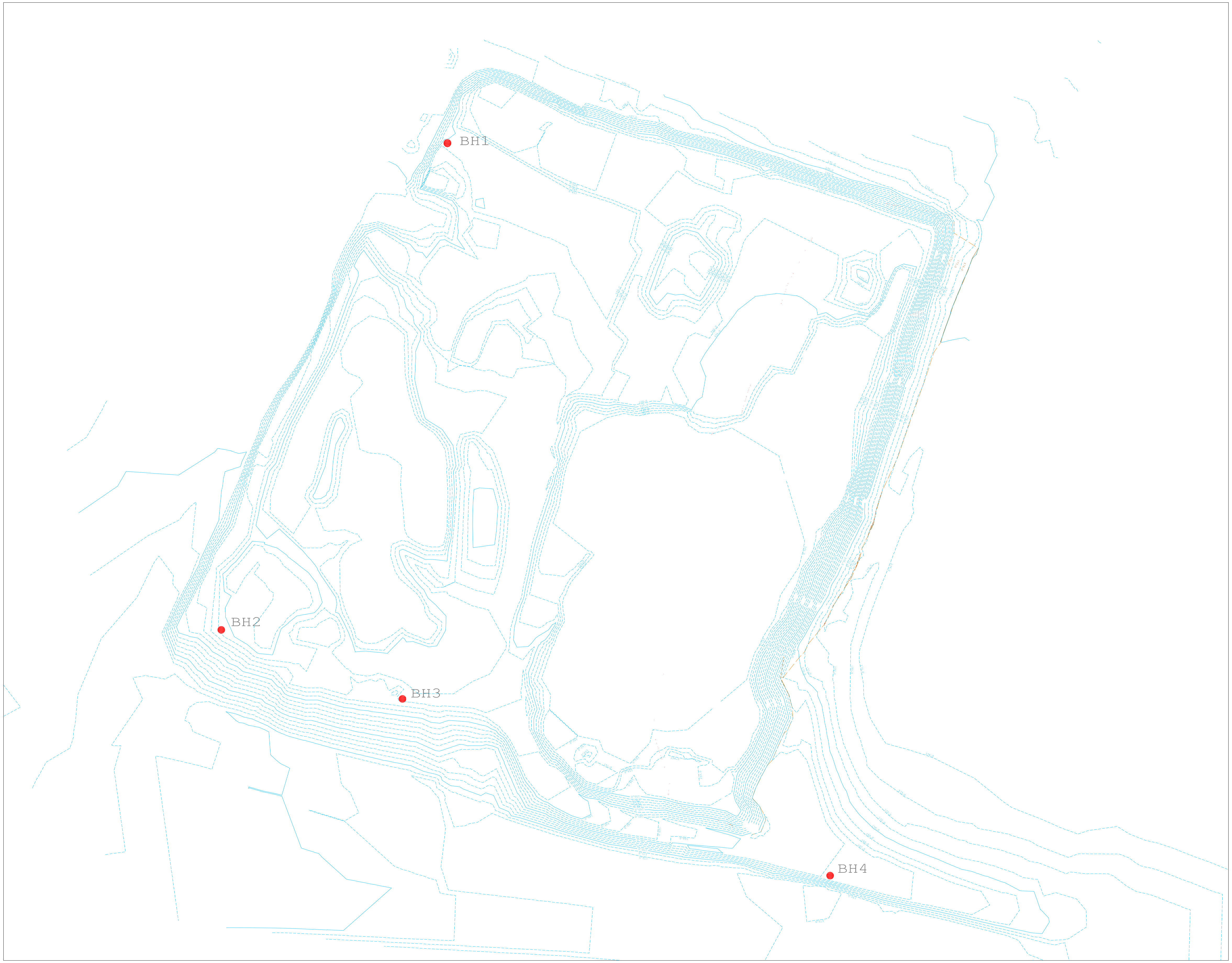
The activities of the Enviroarm CQA Engineer ensured that the borehole was installed to the required depth and specification.

For ENVIROARM LIMITED

A.R.Morris B.Sc, M.Sc, C.Geol, FGS, C.Env, MCIWM

Date: *11th August 2023*

DRAWING



KEY (Where Applicable)

LINE TYPES

- DESIGN CONTOURS 1m INTERVAL
- DESIGN CONTOURS 5m INTERVAL
- SUPPLIED CONTOURS 1m INTERVAL
- SUPPLIED CONTOURS 5m INTERVAL
- SLOPE DESIGN
- SUPPLIED GROUND LEVELS

NOTES

CLARIFICATION OF THE DETAIL SHOWN SHOULD BE BY THE REFERENCE TO THE DIGITAL DATA LAYERING IN THE FIRST INSTANCE.
SURFACE TYPES AND EXTENTS ARE INDICATIVE ONLY

DATUMS

ALL LEVELS RELATED TO SUPPLIED CONTROL.
COORDINATES RELATED TO SUPPLIED CONTROL.
DATA PRESENTED ON A LOCAL PLANE GRID.
DATUMS DETERMINED BY GPS/OSNET OBSERVATIONS.

No	INFORMATION	By	Date	Chkd

REVISIONS

M&A surveys LTD
The Old Chapel
Hopkins Street
Burnt Tree
W.Midlands DY4 7ST
tel 0121-557 0767
fax 0121-557 0797
e-mail manda@mandasurveys.co.uk

CLIENT: WHITEROCK GEOENVIRONMENTAL

LOCATION: SANDY LANE LANDFILL SITE

DRAWING TITLE: BOREHOLES

SCALE: 1:500	SHEET SIZE: A0
DATE: 06.07.2023	DRAWING No: 23/041_01 REV
DRAWN BY: KB CHECKED BY: AH	

Appendix A:

Engineers Daily Log Sheets

DAILY SITE RECORD

Site: Sandy Lane Quarry	Date of Visit: 4th July 2023	Time on Site: 10:30	Time Off Site: 16:40
Personnel/Staff: A R Morris Geotechnical Ltd	Site Conditions/Weather: Sun Rain off: No	Equipment: PST 16GT Rig	
Operations Inspected: BH2	Action: Initial set up in position following check with Cable Scanner. Agreed possible depth for casing during Site Safety Induction		
Comments on Workmanship: PST 16GT Rig had all relevant safety stops and guards in place. All materials including pipes ok and none observed as damaged			
Instructions/Information Issued or Required: Drill depth expected to be approximately 16 metres			
Progress Report *(use additional sheets if necessary)* Damp sandstone conglomerate hit at 7 metres below ground level. Drilled 9 metres into water.9.0 metres of slotted 50mm pipe installed and 7.0 Metres of plan pipe. Grout bentonite installed from 8.0 metres depth to surface. Well head installed and concreted in.			

Signature: A.R.Morris.

DAILY SITE RECORD

Site: Sandy Lane Quarry	Date of Visit: 5th July 2023	Time on Site: 08:00	Time Off Site: 18:00
Personnel/Staff: A R Morris Geotechnical Ltd	Site Conditions/Weather: Sun Rain off: No	Equipment: PST 16GT Rig	
Operations Inspected: Boreholes BH1 and BH3 installed	Action: BH1 done first followed by BH3 located with		
Comments on Workmanship: BH1 to 22 metres. BH3 to 16 metres			
Instructions/Information Issued or Required: Damp sandstone hit at 11 metres in BH1 and at 9.00 metres in BH3			
Progress Report *(use additional sheets if necessary)* BH1 Screened at 8 metres down to 22 metres. BH3 Screened at 8 metres down to 16 metres All boreholes had headworks put on			

Signature: A. R. Morris.

DAILY SITE RECORD

Site: Sandy Lane Quarry	Date of Visit: 6th July 2023	Time on Site: 08:00	Time Off Site: 15:00
Personnel/Staff: A R Morris Geotechnical Ltd	Site Conditions/Weather: Sun Rain off: No	Equipment: PST 16GT Rig	
Operations Inspected: Borehole BH4 and borehole development	Action: BH4 down to 34 metres		
Comments on Workmanship: BH4 to 22 metres.			
Instructions/Information Issued or Required: Damp sandstone hit at 18 metres in BH4			
Progress Report *(use additional sheets if necessary)* BH4 Screened at 8 metres down to 34 metres. All borehole had headworks put on. All boreholes developed so that groundwater monitoring could now start.			

Signature: A.R. Morris.

Appendix C:

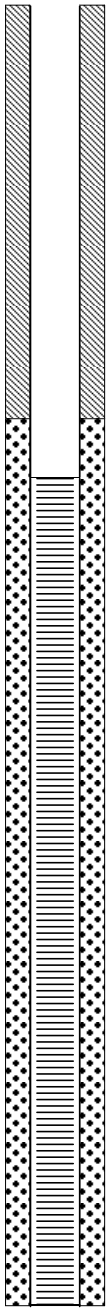
Engineers CQA Drill Logs

Log of Borehole: BH1

Project No.: 0024
Project: Sandy Lane
X Coordinate: 394943
Y Coordinate: 276408
Status: Inert Landfill

Elevation: 160
Total Depth: 22
Project Manager: A R Morris

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	Well Completion Details
		Ground Surface	160.0					
0		White sandstone Wildmoor Sandstone	0.0 159.0					
1		Red sandstone with marl Wildmoor Sandstone	1.0					
2								
3								
4								
5								
6								
7								
8								
9								
10			150.0					
		Hard red sandstone Wildmoor Sandstone	10.0					
11								
12								
13			147.0					
		Very wet Sandstone Wildmoor Sandstone	13.0					
14								
15								
16								
17								
18								
19								
20								
21								
22			138.0 22.0					



Drilled By: Geotechnical Ltd
Drill Method: Air Flush
Drill Date: 05/07/2023

Hole Size:
Datum: 160
Sheet: 1 of 1

Log of Borehole: BH2

Project No.: 0024
Project: Sandy Lane
X Coordinate: 394863
Y Coordinate: 276236
Status: Inert Landfill

Elevation: 156
Total Depth: 16
Project Manager: A R Morris

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	Well Completion Details
		Ground Surface	156.0					
0		Marly sand Wildmoor Sandstone	0.0					
			155.0					
1		Marly sand Wildmoor Sandstone	1.0					
2								
3								
			152.0					
4		Very soft red sandstone Wildmoor Sandstone	4.0					
5								
6								
7								
8								
9								
			146.0					
10		Clayey sandstone Wildmoor Sandstone	10.0					
11								
12								
			143.0					
13		Sandy marl Wildmoor Sandstone	13.0					
14								
15								
			140.0					
16			16.0					

Drilled By: Geotechnical Ltd
Drill Method: Air Flush
Drill Date: 04/07/2023

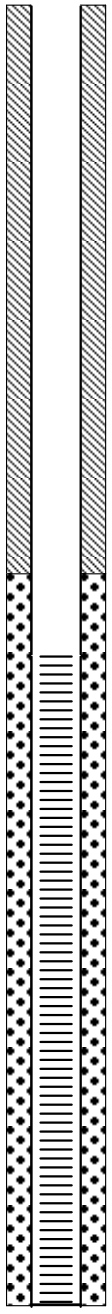
Hole Size:
Datum: 156
Sheet: 1 of 1

Log of Borehole: BH3

Project No.: 0024
Project: Sandy Lane
X Coordinate: 394926
Y Coordinate: 276205
Status: Inert Landfill

Elevation: 158
Total Depth: 16
Project Manager: A R Morris

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	Well Completion Details
		Ground Surface	158.0					
0		Sand Wildmoor Sandstone	0.0 157.0					
1		Loose sand Wildmoor Sandstone	1.0					
2								
3								
4			154.0					
		Very soft red sandstone Wildmoor Sandstone	4.0					
5								
6								
7		Sandstone Wildmoor Sandstone						
8								
9								
10			148.0					
		Clayey sandstone Wildmoor Sandstone	10.0					
11								
12								
13			145.0					
		Clayey sand Wildmoor Sandstone	13.0					
14								
15								
16			142.0					
			16.0					



Drilled By: Geotechnical Ltd
Drill Method: Air Flush
Drill Date: 05/06/07/2023

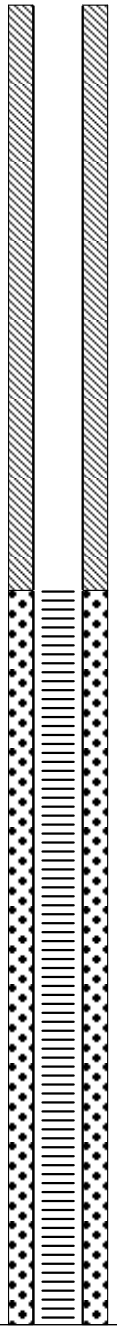
Hole Size:
Datum: 158
Sheet: 1 of 1

Log of Borehole: BH4

Project No.: 0024
Project: Sandy Lane
X Coordinate: 395099
Y Coordinate: 276136
Status: Inert Landfill

Elevation: 166
Total Depth: 34
Project Manager: A R Morris

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	Well Completion Details
		Ground Surface	166.0					
0		Red orange coarse sandstone. Wildmoor Sandstone	0.0					
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



Drilled By: Geotechnical Ltd
Drill Method: Air Flush
Drill Date: 06/07/2023

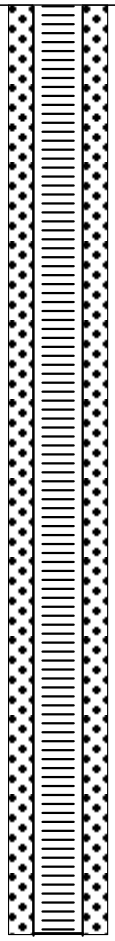
Hole Size:
Datum: 166
Sheet: 1 of 2

Your Company Information Here

Log of Borehole: BH4

Project No.: 0024
Project: Sandy Lane
X Coordinate: 395099
Y Coordinate: 276136
Status: Inert Landfill

Elevation: 166
Total Depth: 34
Project Manager: A R Morris

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	Well Completion Details
21		Red orange coarse sandstone. Wildmoor Sandstone						
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34			132.0 34.0					
35								
36								
37								
38								
39								
40								

Drilled By: Geotechnical Ltd
Drill Method: Air Flush
Drill Date: 06/07/2023

Hole Size:
Datum: 166
Sheet: 2 of 2

Appendix 9

Site Condition Report

[*Guidance: Complete sections 1-3 and submit with application*]

1.0 Site details	
Name of the applicant	NRS Bromsgrove Aggregates Ltd
Activity address	Sandy Lane Quarry Sandy lane, Wildmoor, Bromsgrove, Worcestershire B61 0QT
National grid reference	SO 94980 76315
Document reference and dates for Site Condition Report at permit application and surrender	Permit Application – Site Condition Report Part 1, July 2022 (this report)
Document references for site plans (including location and boundaries)	Site Layout Plan, Drawing No. 20/022 003. The area marked by the green line boundary in the Site Layout Plan is referred to as the 'Site' within this Site Condition Report.
Date of report	21 July 2022

2.0 Condition of the land at permit issue	
Environmental setting including: • geology • hydrogeology • surface waters	<u>Geology</u> Bedrock geology: The quarry is underlain by a layer of Wildmoor Sandstone with subordinate siltstone and mudstone. These are fine-medium grained sediments ranging in colour from bright orange to dark brick red. Superficial geology: N/A - has been removed <u>Hydrogeology</u> The Wildmoor sandstone at depth is classed as a Principal Aquifer. The structure of sedimentary deposits provides high levels of water storage due to their permeability. No superficial aquifer The Site is located within Groundwater Protection Zone III-Total Catchment (SPZ). <u>Hydrology</u> The closest surface water features to the site are the drainage ponds within the active Wildmoor Quarry, 120m to the south of the Site boundary.
Pollution history including: • pollution incidents that may have affected land • historical land-uses and associated contaminants • any visual/olfactory evidence of existing contamination • evidence of damage to pollution prevention measures.	Prior to quarrying activities, the Site was originally agricultural farmland. There is no evidence of existing contamination present on the Site. No information of any pollution incidents has been identified which may have affected the state of the land at the Site. No visual or olfactory evidence of existing contamination. No evidence of damage to pollution prevention measures

2.0 Condition of the land at permit issue	
	Adjacent to the western boundary of the site, is a restored closed non-hazardous landfill site. The landfill site is monitored for gas, leachate and groundwater quality by Veolia. Surface water run-off from the landfill drains predominately away from the Site due to the restoration contours. The run-off from the landfill surface is considered to be clean as the landfill is capped. Surface water run-off from the surfaced entrance area of the landfill site drains to a soakaway immediately to the southeast corner. The drainage water passes through a silt and oil interceptor prior to discharge.
AQMA	The Site is not located within an AQMA. The closest AQMA is designated by Birmingham City Council within the city, c.3.8km east of the Site. The AQMA is designated for NO_x and Pm_{10}.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	No records of historical site investigations, reports or remediation were available for this Site.
Baseline soil and groundwater reference data	No baseline soil quality data was available to view at the time of writing this report. Groundwater is monitored at the adjacent Site by Veolia. Data was not available at the time of writing this report. Is proposed to install groundwater monitoring boreholes at the Site to facilitate monitoring of the groundwater at, prior to infilling commencing.
Supporting information	N/A

Site Reconnaissance Report (May 2022)	
Access arrangements	The Site is accessed off Sandy Lane to the south of the site boundary. Grid reference SO 95199 76101.
Site layout including presence and condition of above and below ground buildings/structures etc.	No structures present on Site.
Evidence of disturbed land, discoloured soil or water, subsidence, above ground deposits etc.	N/A. The Site comprises a sand quarry void. The void comprised exposed natural sands only.
Vegetation type and signs of distress or absence where it might be expected.	Widespread mixed vegetation comprising deciduous trees around the boundary perimeter and saplings, shrubs, moss dispersed throughout the Site. No evidence of stress to vegetation.
Detectable odours from the land.	No odours detected.
Liquid discharges from the site.	No discharges from the Site.
Direction and flow of surface water run-off and presence of ponding.	Evidence of minor ponding in the southwest corner of the Site. No surface water flow evident on Site. Anecdotal evidence from landfill manager is that there is some ephemeral flooding of the quarry base following heavy rainfall. This percolates naturally to the groundwater aquifer.
Presence and condition of surface water features.	No surface water features on site.
Evidence of any accidental/uncontrolled released at the Site (previous or current).	No visual or other evidence of accidental/uncontrolled released on the Site.
Identify potential access constraints e.g. overhead cables, located of machinery, operations at the site.	The site is accessed from a concreted bell-mouth entrance from Sandy Lane Road at national grid reference; SO 95195 76089. No constraints identified.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation, and verification reports (where available.	No records of historical site investigations, reports or remediation were available for this Site.
Baseline soil and groundwater reference data.	None are available for this Site.

3.0 Permitted activities	
Permitted activities	No permitted activities are currently undertaken on Site. The proposed permitted activity is the deposit of waste for recovery to allow restoration of the sand quarry. The boundary of this proposed waste activity is shown on the Permit Boundary Plan 20/022e 001. The hazards to land and groundwater (including fugitive emissions associated with the planned waste activity have been considered in an Environmental Risk Assessment.
Non-permitted activities undertaken	Mineral extraction (sand).
Document references for: • plan showing activity layout; and • environmental risk assessment.	• Site Layout Plan No. 20/022 003 • Permit Application Report Appendix 8, Environmental Risk Assessment, V1.

Drawings

Drawing No. 20/022 003 Site Layout Plan

Client: NRS Bromsgrove Aggregates Limited

Title: Site Layout Plan

Site:
Sandly Lane Quarry,
Sandy Lane,
Wildmoor,
Bromsgrove,
Worchestershire,
B61 0QT

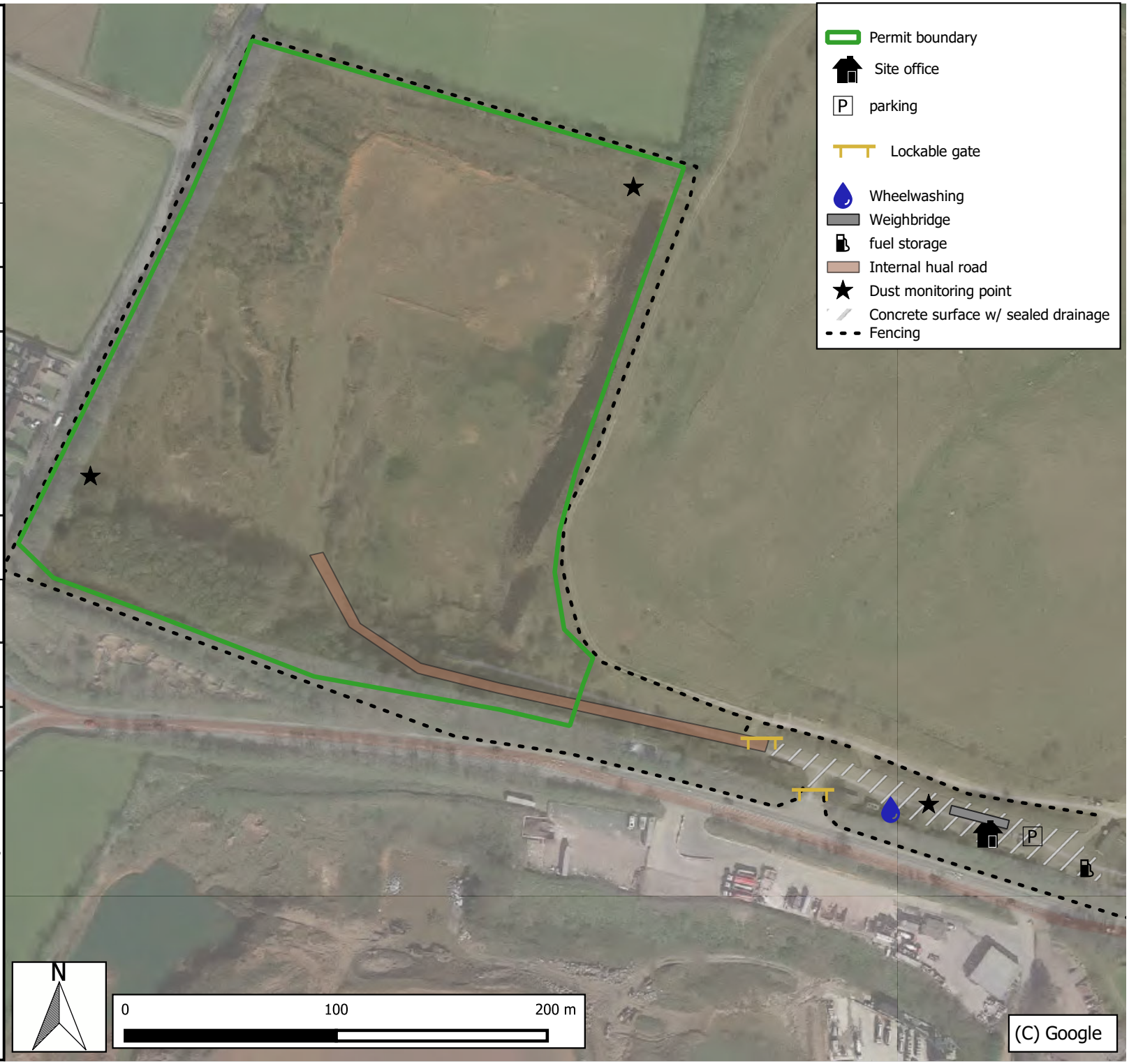
Date: 20 October 2022

Scale: 1:2500

Reference: 20/022 003

Produced By: BS
Checked By: KB

WESTBURY ENVIRONMENTAL
T 01952 879705 E info@westburyenv.co.uk
A Agriculture House, Southwater Way Telford, Shropshire, TF3 4NR
W www.westburyenv.co.uk



Appendix 10

Evidence of Technically Competent Management

Operator Competence Certificate

Title:

Open Inert Landfill

This Certificate is awarded to

Reece Townend

Verification date: 15/10/2019

Authorised:

Learner ID: 29267

Certificate No.: 5152353

Date of Issue: 15/10/2019

WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

This certificate is jointly awarded by WAMITAB and the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.

Continuing Competence Certificate

This certificate confirms that

Reece Townend

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 22/06/2021

LIN	Landfill - Inert Waste
TSNH	Transfer - Non Hazardous Waste
TMNH	Treatment - Non Hazardous Waste

Expiry Date: 22/06/2023

Verification date: 17/06/2021

Authorised:

Director of Qualifications and Standards

Learner ID: 29267

Certificate No.: 5180740

Date of Issue: 22/06/2021

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

00166661

Technically competent manager details

Save this form on your computer. Open it, type in the details, then save and upload it.
If you prefer, you can print it out, fill it in, and then scan and upload it.

Give details for every manager who will be responsible for the permitted operations.

Technically competent manager 1

First name	Reece
Last name	Townend
Date of birth DD/MM/YYYY	[redacted]
Phone - landline or mobile	07572051999
Email	reece.t@nrswastecare.com

Give details for **all** permitted operations that this person provides technical competence for, in addition to the current application. Include permits held by other operators.

Permit number e.g. EPR/AB1234CD	Site address Address is not needed for mobile plant permits	Postcode	Notes
CB3805HC	Area G Birmingham Road, Meriden	CV7 7JS	Landfill and Recycling
EB3930AS	Area E Cornets End Lane, Meriden	CV7 7LG	Not operational currently
LB3235RJ	Area E Cornets End Lane, Meriden	CV7 7LG	Not operational currently
LB3931AF	Area E Cornets End Lane, Meriden	CV7 7LG	Not operational currently
HB3802HF	OS Holdings, Cornets End Lane, Meriden	CV7 7LG	Recycling
FB3009GX	Great Saredon Road, Wolverhampton	WV10 7LL	Landfill
FB3009FU	Great Saredon Road, Wolverhampton	WV10 7LL	Restoration
FB3009HG	Great Saredon Road, Wolverhampton	WV10 7LL	Recycling

If a second manager is also responsible, give their details on the next page.

Technically competent manager 2

First name	
Last name	
Date of birth DD/MM/YYYY	
Phone - landline or mobile	
Email	

Give details for **all** permitted operations that this person provides technical competence for, in addition to the current application. Include permits held by other operators.

Permit number e.g. EPR/AB1234CD	Site address Address is not needed for mobile plant permits	Postcode	Notes

If a third manager is also responsible, give their details on the next page.

Technically competent manager 3

First name	
Last name	
Date of birth DD/MM/YYYY	
Phone - landline or mobile	
Email	

Give details for **all** permitted operations that this person provides technical competence for, in addition to the current application. Include permits held by other operators.

Permit number e.g. EPR/AB1234CD	Site address Address is not needed for mobile plant permits	Postcode	Notes

If a fourth manager is also responsible, give their details on the next page.

Technically competent manager 4

First name	
Last name	
Date of birth DD/MM/YYYY	
Phone - landline or mobile	
Email	

Give details for **all** permitted operations that this person provides technical competence for, in addition to the current application. Include permits held by other operators.

Permit number e.g. EPR/AB1234CD	Site address Address is not needed for mobile plant permits	Postcode	Notes

If there are other managers responsible for the permitted operations, add extra pages to this document.

Continuing Competence Certificate

This certificate confirms that

Reece Townend

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 31/05/2023

LIN	Landfill - Inert Waste
TMNH	Treatment - Non Hazardous Waste

Expiry Date: 31/05/2025

Verification date: 30/05/2023

Authorised:

Professional Services Director

Learner ID: 29267

Certificate No.: 5227097

Date of Issue: 31/05/2023

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

Scan code on reverse to authenticate that this is a genuine paper