Bromsberrow North Sandpit: Environmental Risk Assessment

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Prepared for

Allstone Sands Gravels Aggregates Trading Co. Ltd
Allstone House
Myers Road
Gloucester
GL1 3QD

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CONFIDENTIAL

New Zealand House, 160-162 Abbey Foregate,
Shrewsbury, Shropshire
SY2 6FD

Telephone: +44 (0)1743 276 100
Facsimile: +44 (01743 248 600

Registered Office:
Stantec UK Ltd
Buckingham Court
Kingsmead Business Park
Frederick Place, London Road
High Wycombe HP11 1JU
Registered in England No. 1188070

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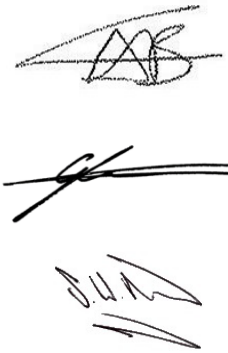
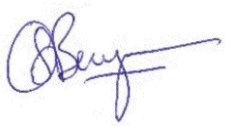
	Name	Signature
Author	Chloe Austin-Bangs / Georgina Watkins / Simon Howard	
Checked by	Georgina Watkins	
Reviewed by	Christopher Berryman	

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Issue	Date	Status	Comment	Author	Checker	Reviewer
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2	28/11/2023	Draft	Second draft updated for 2023	SH	GW	-
3	10/01/2024	Final	Final issue	SH	GW	CB

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TABLES

DRAWINGS

Site Location Plan	Drawing No. 21-248-D-010 Rev 02
Sensitive Receptors Plan	Drawing No. 331201261D2

1 Introduction

1.1 Background

This Environmental Risk Assessment (ERA) forms part of the Environmental Management System (EMS) and is a supporting document for the application for an Environmental Permit (EP) for the restoration of the Bromsberrow North Sandpit, Bell Lane, Bromsberrow Heath, Ledbury, Gloucestershire, HR8 1NX (the Site) by inert landfill.

Stantec UK Limited (Stantec) has been instructed to prepare this application on behalf of Allstone Sands Gravels Aggregates Trading Co. Ltd ('Allstone'). The Operator of the EP will be Allstone.

Bromsberrow Sand and Gravel Company Ltd (BSGC), a wholly owned subsidiary of Allstone, has applied to Gloucestershire County Council for an Initial Review of planning conditions relating to the extraction of sand from the Site, which is operated by BSGC. The application Site extends to approximately 5 hectares (ha).

Gloucestershire County Council (GCC) is the determining Minerals Planning Authority (MPA), and it has a statutory duty to review what are commonly referred to as 'old' planning permissions for mineral working. The process of review is referred to by the acronym 'ROMP' – Review of Old Mineral (planning) Permissions.

Further development and restoration of the quarry has been divided into several phases according to the restoration plans provided by BSGC and this will provide a total of 341,000 tonnes of mineral (red sand) to be extracted. Based on current rates of extraction, the end of the sand extraction is expected in 2032.

In addition to the phased extraction of the remaining mineral reserve, BSGC proposes a linked programme of phased restoration to either agriculture or amenity use, using imported inert material to re-establish original ground levels. A rolling programme of continued sand extraction and phased restoration will be established, and it is estimated that a total of 670,000m^3 of inert material will be imported to achieve this restoration, which is estimated to be completed by 2044. The phased restoration will comprise filling the void progressively and in accordance with an inert landfill EP, issued by the Environment Agency (EA).

This ERA has been completed in accordance with prevailing EA technical guidance (EA, 2023). The guidance requires that all receptors that are proximate to the Site, and could be reasonably affected by the activities, are identified and considered.

This report describes the site setting and identifies nearby sensitive receptors (Section 2) and potential hazards (Section 3). It then assesses the risk posed by the proposed waste operations to the local human population and environment (Section 4). Risk prevention through operational management is also discussed, although the operational management of the Site is primarily described in the Site Operating Plan (SOP) (Stantec, 2024a).

2 Site Location and Setting

2.1 Site Location

The Site location is shown in **Error! Reference source not found.**. A complete description of the Site setting is provided in the Environment Setting and Site Design (ESSD) Report (Stantec, 2024b) prepared as part of the EP application. A summary of the Site setting is provided in Table 2.1.

Figure 2.1 Site Location

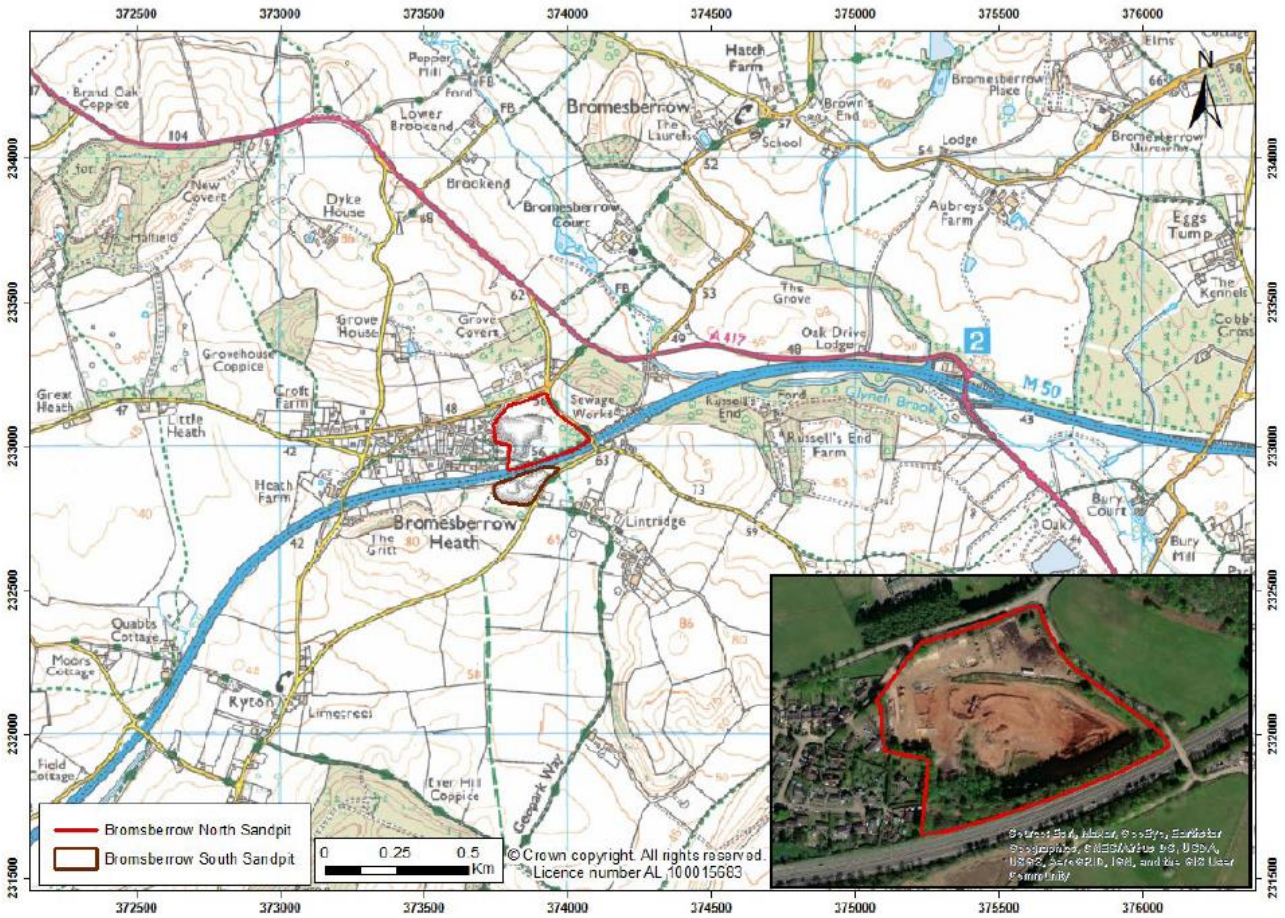

Table 2.1 Site Setting

Site address	Bromsberrow North Sandpit, Bell Lane, Bromsberrow Heath, Ledbury, Gloucestershire, HR8 1NX
NGR	SO 73896 33065
Site location	The Site is located in Bromsberrow Heath, Gloucestershire, approximately 4.5 km southwest of Ledbury and 7 km north of Newent, close to the village of Bromsberrow in Gloucestershire. Existing access to the Site is via Bell Lane, which runs along the northwestern boundary of the Site, as seen in Stantec Drawing No. 331201261D1. The access to the Site is proposed to be changed in the future to an access point from Wood End Street.

Topography	The elevation of the perimeter of the Site ranges between 55 and 60 metres Above Ordnance Datum (mAOD), while the proposed extraction void will extend to 36 mAOD. The Site topography is generally consistent with the western surroundings; however, the land rises eastwards to form Bevanhill Coppice, to more than 75 mAOD. To the south the land also rises from the Site, ranging between 70 to 75 mAOD around Russellsend Coppice to the southeast. East and north of the coppices, the land falls to 50 mAOD in the Glynch Brook valley.
Previous land use	The Site has been used as a sandpit for around 70 years and was previously woodland and coppice.

2.2 Local Land Use Summary

A summary of local land use around the Site is provided in Table 2.2.

Table 2.2 Surrounding Land Uses

Surrounding land use	North	Beach Lane runs along the northern boundary of the Site, with Bell Lane forming the northwestern boundary, from which the Site is currently accessed. The Site access is proposed to be changed to new access point to be constructed off Wood End Street to the east. The Bromsberrow Borehole Pumping Station (BPS) Public Water Supply (PWS), operated by Severn Trent Water (STW), is located to the immediate north of the Site, beyond Beach Lane. Willows Farm also lies to the north beyond Beach Lane. Further north the land use is predominantly agricultural, with large areas of polytunnels being observable from satellite imagery.
	East	Wood End Street runs along the eastern boundary of the Site, beyond which Bromsberrow (High Bank) Local Wildlife Site (LWS) is located. An additional LWS, Bromsberrow (M50), is located 20m east of the Site along northern boundary of the M50 motorway. The majority of the land use to the east of the site is agricultural with areas of woodland (including Bevanhill Coppice, located 75m from the Site).
	South	The southern boundary of the Site is adjacent to the M50 motorway which runs in a southwest-to-northeast direction, beyond which the restored Ryton Road Sand Quarry Landfill is located, circa 35m from the Site's southern boundary. Further south the land use is predominantly agricultural, with large areas of polytunnels being observable from satellite imagery.
	West	To the west of the Site is the residential area of Bromsberrow Heath, with the closest residential property located 10m from the Site boundary.

2.3 Identified Receptors

An assessment of potential receptors (including residential and commercial properties and businesses; public amenities; controlled waters; ecological; protected species; and cultural heritage)

which are located in the vicinity of the Site and may be impacted by the proposed operations has been undertaken.

A number of sensitive receptors have been identified and are shown on Stantec Drawing No. 331201261D2. The distance of these receptors from the Site boundary and their direction relative to the Site are detailed in Table 2.3.

Table 2.3 Potentially Sensitive Receptors in the Vicinity of the Site

Ref	Receptor	Receptor type	Distance (m)	Direction from nearest boundary
R0	Groundwater	Controlled waters	On site	-
R1	Public Highway: Bell Lane	Public highway (road)	<10	Northwest
R2	Public Highway: Wood End Street	Public highway (road)	<10	East
R3	Public Highway: Beach Lane	Public highway (road)	<10	North
R4	Public Highway: M50 Motorway	Public highway (motorway)	<10	South
R5	Bromsberrow High Bank LWS	Local Wildlife Site	<10	Northeast
R6	Bromsberrow Heath	Residential area	<10	West
R7	Bromsberrow LWS	Local Wildlife Site	20	East
R8	Ryton Road Sand Quarry Landfill (Bromsberrow South)	Landfill site operated by Terra Firma	35	South
R9	Bevanhill Coppice	Nearest area of deciduous woodland to the Site	75	Northeast
R10	Bromsberrow BPS and Willows Farm	PWS and adjacent residential property	100	North
R11	Public Highway: A417	Public highway (road)	220	Northeast
R12	Lintridge Farm	Farm – agricultural buildings and land	200	South
R13	Ecasks	Barrel supplier	230	South
R14	Church View Farm	Farm – agricultural buildings and land	310	Northeast
R15	Grove House	Ponds	330	Northwest

Ref	Receptor	Receptor type	Distance (m)	Direction from nearest boundary
R16	Glynch Brook	Surface water feature – stream	350	Northeast
R17	Bromesberrow Court	Farm – agricultural buildings and land	550	Northeast
R18	Foxbury Fields Vineyard & Winery	Vineyard	700	East
R19	The Poplars, Dyke House	Conference centre	820	Northwest

The Pre-application Nature and Heritage Conservation screening provided by the EA (EPR/LB3507FW/A001) shows a historic protected habitat, Grovehouse Coppice, within the Site boundary. This area of woodland no longer exists on the Site. Historic imagery shows the coppice disappearing between 2009 and 2013. Therefore, the Grovehouse Coppice is not considered as a sensitive receptor in this ERA.

The sensitivity and potential impact on the sensitive receptors identified is discussed in the various supporting documents, including (but not necessarily limited to):

- The Dust and Emissions Management Plan (Stantec, 2024c);
- The Noise Impact Assessment (24Acoustics, 2022);
- The Ecological Appraisal (AA Environmental, 2022);
- The Hydrogeological Risk Assessment (Stantec, 2024d); and
- The Landfill Gas Risk Assessment (Stantec, 2024e).

3 Potential Hazards

3.1 Amenity Hazards

3.1.1 Odour

Odour from waste operations can cause significant nuisance to nearby residents and businesses.

Wastes to be imported to the Site will not contain putrescible materials and are highly unlikely to present any odour risk as they will consist only of materials suitable for the inert landfill activity.

Strict waste acceptance criteria will be implemented by the Waste Acceptance Procedures for the Site. This will ensure that any non-permitted waste is rejected from the Site. The Waste Acceptance Procedures are set out in the Site Operating Plan (SOP) (Stantec, 2024a). The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue.

In the unlikely event that putrescible materials are accepted or an odour is produced from the EP operations, then the procedures within the SOP (and wider EMS) would then be reviewed to determine if any change in operations or management would be required to minimise the risk of such an incident occurring in the future.

For the reasons above, an Odour Management Plan is not required for this Site.

3.1.2 Noise and Vibration

Noise has the potential to cause nuisance, loss of amenity and loss of sleep to the local human population.

A Noise Impact Assessment (NIA) (Ref R9694-1 Rev 0) has been prepared by 24Acoustics as part of the ROMP application for the Site (24Acoustics, 2022). Noise and vibration associated with the proposed on-site activity will be restricted primarily to the movement and operation of Site plant and on-site mobile plant and equipment during operational hours defined by the planning consent. All plant will be fitted with appropriate and well-maintained silencers. All of the plant and equipment kept on the Site will be maintained in accordance with the manufacturer's recommendations. This results in a low likelihood of excessive noise from plant due to malfunction.

The enhanced service pre-application advice received from the EA (Ref. ZP3825SM/P001, dated 8 November 2023) concluded that a NIA and Noise Management Plan (NMP) are not required for the EP application, based on an EA screening exercise and the following information:

- The activity is wholly outdoors with no processing of material.
- The proposed activity is an inert landfill with no waste processing.
- No activity is carried out during the night.
- The site will receive no more than 100,000 tonnes per annum.
- The nearest residential receptors are along the western boundary, as close as 10m from the boundary.

Were any of the criteria above to change to increase the risk of noise, further advice would be sought from the EA as an NIA and NMP may be required to assess and manage this risk.

3.2 Dust

Particulate emissions can arise from the unloading and on-site handling and placement of materials, handling of existing on-site materials and vehicle movements on-site and on potentially dusty roads.

A detailed Dust and Emissions Management Plan (DEMP) has been produced by Stantec to support this EP application. The DEMP (Stantec, 2024c) assesses the risks of dust generation from Site restoration activities, provides information on the operations to be carried out under the EP on the Site and sets out how Allstone intend to control and manage potential dust emissions.

Soil handling works will be conducted in accordance with prevailing EA guidance as well as relevant industry guidance, including but not limited to (IoQ, 2021) and (DEFRA, 2009).

Strict waste acceptance controls will ensure that only suitable materials will arrive to and be deposited at the Site, which will not include dry or dusty materials. Any rogue or dusty loads which may arrive on Site will either be rejected upon arrival or quarantined on-site with sheeting prior to off-site disposal.

Further dust control measures are presented in the DEMP.

3.2.1 Mud and Debris

All vehicles will have travelled to the Site via the public highway, accessing the Site via Wood End Street through the entrance along the north-eastern boundary. Although vehicles may track over potentially muddy surfaces when on site, a wheel wash facility will be maintained to clean any mud from vehicles before leaving the Site.

The DEMP (Stantec, 2024c) assesses the risks of mud and debris generation from Site activities, provides information on the operations to be carried out on the Site and sets out how Allstone intend to control and manage potential dust and mud emissions.

As set out in the DEMP, mud control measures include:

- All vehicles exiting the Site must do so via the wheel wash.
- The Site and unpaved surfaces/ haul routes are dampened down by mobile water bowsers when overly dry or dusty conditions present.
- Should the above measures fail, a road sweeping vehicle will be deployed when necessary to mitigate any mud on the public highways and prevent the generation of dust as a result of the Site operations.

Debris control measures include:

- Vehicles delivering waste are sheeted.
- Where debris is identified, it will be cleared up immediately, either manually or by road sweeper.
- All areas are subject to regular housekeeping.

3.3 Litter

Materials received at the Site under the EP will not present a litter risk. As such, it is not considered necessary to produce a more detailed risk assessment.

Strict waste acceptance criteria will be implemented by the Waste Acceptance Procedures for the Site. This will ensure that any non-permitted waste is rejected from the Site. The Waste Acceptance Procedures are set out in the SOP (Stantec, 2024a).

3.4 Pests and Vermin

Materials received at the Site under the EP will not contain putrescible materials which may attract pests or vermin. As such, it is not considered necessary to produce a more detailed risk assessment.

Strict waste acceptance criteria will be implemented by the Waste Acceptance Procedures for the Site. This will ensure that any non-permitted waste is rejected from the Site. The Waste Acceptance Procedures are set out in the SOP (Stantec, 2024a).

3.5 Ecology

The Pre-application Nature and Heritage Conservation Screening Report provided by the EA (EPR/LB3507FW/A001) records the Bromsberrow (High Bank) LWS and Bromsberrow M50 LWS within 200m of the site. It also recognises that the Glynch Brook, is a protected fish migratory route for the European Eel and is a habitat for the Bullhead, a protected fish species.

An ecological appraisal was carried out by AA Environmental Ltd to support the ROMP application for the Site (AA Environmental, 2022). The findings of this ecological appraisal indicate that there are no statutory or non-statutory designated sites that would be directly affected by the proposals and no over-riding ecological constraints to the development proposals (including the proposed infill). Generic mitigation measures have been suggested as part of the report to reduce the impact of works during the infilling of the Site to local wildlife.

The risk from proposed Site activities to ecological receptors is considered to have been fully addressed as part of the planning process and this ERA, and as such it is not considered necessary to produce a more detailed risk assessment.

3.6 Water Environment

Potential risks from proposed Site activities to the local water environment include potential leaching of contaminants and / or suspended solids from imported materials stored on the Site and infiltration to groundwater. There are also potential risks to groundwater and possibly surface waters from contaminated run-off associated with e.g. fuel or oil spills or firewater.

Allstone proposes to apply strict Waste Acceptance Procedures for all waste materials accepted for the restoration of the Site, as detailed in the SOP (Stantec, 2024a). As such it is considered that the risk of rogue loads being deposited at the Site is appropriately mitigated. The SOP also discusses the control measures to prevent and actions to be taken in the event of pollution incidents. Landfill engineering including an artificially enhanced geological barrier are proposed in the Environmental Setting & Site Design (ESSD) report (Stantec, 2024b).

It is not anticipated that impacts posed by climate change will have a significant impact upon the Site, given the management / mitigation measures that are proposed to be put in place.

A Hydrogeological Risk Assessment (HRA) has been prepared as part of the EP application that this ERA supports (Stantec, 2024d). The HRA considers that the proposed operations at the Site are

unlikely to pose a risk to groundwater and controlled waters. The HRA should be consulted in full for more information.

Given the above it is considered that the proposed inert landfill will not pose a significant risk to the local water environment.

3.7 Landfill Gas Generation Potential

A Landfill Gas Risk Assessment (Stantec, 2022e) has been prepared as part of the EP application that this ERA supports.

EA guidance (EA, 2004) indicates that new inert landfills ought not to pose a landfill gas hazard. The emphasis in the risk assessment is, therefore, placed on the waste acceptance procedures introduced to ensure that only inert waste is deposited at the Site. As these measures are robust, then the landfill gas source is demonstrably negligible.

The accumulation and migration of landfill gas from the fill material will be controlled by the implementation of appropriate measures including strict waste acceptance procedures, detailed in the SOP (Stantec, 2024a), which will ensure that no fill materials likely to generate significant volumes of landfill gas will be accepted. Consequently, the risk assessment has identified that the probability of the fill materials providing a significant source of landfill gas is very low. No gas extraction and utilisation will therefore be required at the Site.

Given the inert nature of the proposed fill materials within the restoration, and the strict waste acceptance procedures that will be put in place, the risk of future methane and carbon dioxide emissions during both the operational and aftercare phases is low. Similarly, in the absence of a significant landfill gas source, no appreciable risks are likely to result, even if damage to the artificially enhanced geological barrier were to occur.

4 Environmental Risk Assessment

4.1 Hazard Pathways

When choosing the receptors, the closest and the most sensitive (if different from the closest) have been considered in each direction from the hazard. The risk assessment accounts for the mechanism of transport to the identified receptor.

4.2 Probability of Exposure

Probability of exposure is determined by the distance of the receptor to the Site and the likelihood of the hazard affecting the receptor (e.g. in the case of dust risks this would include consideration of the frequency of the prevailing wind in that direction).

4.3 Method of Risk Estimation

Table 4.1 Estimation of Risk below has been used to demonstrate the estimation of risk from consideration of the magnitude of consequences and probabilities arising from operations to be carried out under the EP.

Table 4.1 Estimation of Risk

		Consequence			
		High	**Medium**	**Low**	**Very Low**
Probability	**High**	High	High	Medium/Low	Low/Very Low
	Medium	High	Medium	Low	Very Low
	Low	High/Medium	Medium/Low	Low	Very Low
	Very Low	Medium/Low	Medium/Low	Low	Very Low

Although the above table is a simplification that cannot represent the true complexity of risk assessment, it has been used as a guide in preparing this ERA report.

Table 4.2 Environmental Risk Assessment

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Releases of particulate matter (dust)	Harm to human health - respiratory irritation and illness.	Air transport then inhalation	Medium	Medium	Medium	There are residential properties within 10m of the Site. The operations undertaken on the Site may produce dust from movement of vehicles in dry and/or windy weather. Permitted waste types are inert.	The DEMP considers the potential sources of particulate matter and dust associated with the proposed operations to be undertaken on the Site. The potential for dust impacts on local sensitive receptors are subsequently assessed together with the identification of appropriate mitigation measures and sets out how the Site will prevent, mitigate and monitor against dust and particulate emissions from the Site. Soil handling works will be conducted in accordance with prevailing EA guidance as well as relevant industry guidance, including but not limited to (IoQ, 2021) and (DEFRA, 2009). The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Releases of particulate matter (dust)	Nuisance - dust on cars, clothing etc.	Air transport then deposition	Medium	Low	Low			Very Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Litter	Nuisance, loss of amenity and harm to animal health.	Air transport then deposition	Low	Low	Low	Local residents are usually sensitive to litter. Wastes to be accepted at the Site have a low litter potential.	Strict waste acceptance procedures will be implemented on the Site. The Site and surrounding access roads will undergo housekeeping checks to remove observed litter. The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue. Staff will be trained in accordance with procedures within the SOP.	Very Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Mud and debris on road.	Nuisance, loss of amenity, road traffic accidents.	Tracked on tyres of vehicles entering and leaving the site and from loads which are not properly contained. Debris falling off vehicles.	Low	Medium	Medium/Low	The operations undertaken on the Site may produce mud and debris from the movement of vehicles. Local residents are usually sensitive to mud and debris on roads.	The DEMP assesses the risks of mud and debris generation from Site activities, provides information on the operations to be carried out on the Site and sets out how Allstone intend to control and manage potential dust and mud emissions. The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Odour	Nuisance, loss of amenity.	Air transport.	Very Low	Medium	Medium/Low	Wastes to be imported to the Site will not contain putrescible materials and are highly unlikely to present any odour risk as they will consist only of materials suitable for the inert landfill activity.	Strict waste acceptance procedures will be implemented on the Site to ensure that incoming waste loads do not contain malodourous materials. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	Noise and vibration	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground	Medium	Medium	Medium	Local residents often sensitive to noise and vibration. Noise and vibration associated with the proposed on-site activity will be restricted primarily to the movement and operation of Site plant and on-site mobile	A NIA has been prepared by as part of the ROMP application for the Site (24Acoustics, 2022). The enhanced service pre-application advice received from the EA concluded that a NIA and NMP are not required for the EP application, based on an EA screening exercise and the assumptions made around the activity. Were any of the criteria above to change to increase the risk to noise, further advice	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
							plant and equipment during operational hours defined by the planning consent. It is also noted a potentially more significant source of noise adjacent to the site is the M50 motorway.	would be sought from the EA as an NIA and NMP may be required. All plant will be fitted with appropriate and well-maintained silencers. All of the plant and equipment kept on the Site will be maintained in accordance with the manufacturer's recommendations. This results in a low likelihood of excessive noise from plant due to malfunction. The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue. Staff will be trained in accordance with procedures within the SOP.	
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces.	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	Low	Low	Wastes to be imported to the Site are limited to inert wastes that are not normally attractive to animals and birds.	Strict waste acceptance procedures will be and implemented on the Site to ensure that incoming waste loads do not contain material that could attract scavenging animals. The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue. Staff will be trained in accordance with procedures within the SOP.	Very Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby	Pests (e.g. flies)	Harm to human health. Nuisance and loss of amenity.	Air transport and over land.	Low	Medium	Medium/Low	Wastes to be imported to the Site are limited to inert wastes that are not normally likely to encourage pest infestations.	Strict waste acceptance procedures will be implemented on the Site to ensure that incoming waste loads do not contain material that could attract pests. Site will be checked regularly for evidence of pest infestations. The SOP includes a complaints procedure, which aims to investigate any complaint, identify the source and resolve the issue.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
workplaces and local environment.								Staff will be trained in accordance with procedures within the SOP.	
Groundwater	'Leachate' from waste and contaminated rainwater run-off from waste e.g. Suspended solids.	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole.	Transport through soil/ groundwater then extraction at borehole.	High	High	High	The Site is located on a Principal Aquifer and is in a Groundwater Source Protection Zone 2 (SPZ2) and is adjacent to an SPZ1. The HRA completed for the Site considers it unlikely for the operations to have a negative impact on groundwater (or controlled waters). The HRA should be consulted in full for more information.	Strict Waste Acceptance Procedures will be in place for all waste materials accepted for the restoration of the Site, as detailed in the SOP. As such it is considered that the risk of rogue loads being deposited at the Site is appropriately mitigated. The SOP also discusses the control measures to prevent and actions to be taken in the event of pollution incidents. Staff will be trained in accordance with procedures within the SOP. Landfill engineering including an artificially enhanced geological barrier are proposed in the ESSD.	Low
Protected nature conservation sites including local wildlife sites.	Dust and noise.	Harm to protected sites through contamination, smothering, disturbance, etc.	Air transport of dust, noise disturbance	Medium	Medium	Medium	Emissions to air may cause harm to and deterioration of nature conservation sites. Vehicles moving on and around site causing disturbance through noise.	Implementation of the SOP and DEMP should lead to harm not being caused to the nearby protected sites. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow	Flooding of site.	If waste contaminated water is washed off site it may	Flood waters.	Low	Medium	Medium/Low	Permitted waste types are inert so any waste washed off site will add to the volume of local post-flood clean-	Strict waste acceptance procedures will be implemented on the Site to ensure that only suitable waste types are accepted onto the Site.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
Heath, workers and visitors to nearby workplaces and local environment.		contaminate buildings, gardens, watercourses and natural habitats.					up workload rather than the hazard. The Site is located within Flood Zone 1, which means it has a low probability of flooding from rivers.	Staff will be trained in accordance with procedures within the SOP.	
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces and local environment.	Freezing temperatures leading to freeze/thaw of pipes and tanks, resulting in leakages.	Contamination of buildings, gardens, watercourses and natural habitats.	Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	High	High/Medium	Permitted waste types are inert. Fuel/oil, etc. storage tanks on Site will be bunded and placed on impermeable surfaces.	Any pipes and tanks, including any insultation and protection of pipework, will be routinely checked for integrity in accordance with the SOP. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces and /or livestock gaining unauthorised access to the waste operation.	All on-site hazards, wastes, machinery, and vehicles.	Bodily injury.	Direct physical contact.	Low	High	High/Medium	Permitted waste types are inert and therefore there is only a low risk from the waste itself. Movements of mobile plant and vehicles on Site. Presence of large stockpiles of materials on site. Steep slopes/cliffs present a fall risk. Site is secured as described in SOP.	Site security measures as set out in the SOP.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
							No livestock within close proximity to the Site.		
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces and local environment.	Arson and/ or vandalism causing the release of polluting materials to air (smoke or fumes) and firewater or spillage of polluting liquids to water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/ vandals. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from and via surface water drains and ditches.	Low	High	High/Medium	Permitted waste types are inert so very low risk of combustion. Fuel/oil, etc. storage tanks on Site will be bunded and placed on impermeable surfaces. Site is secured as described in SOP.	Site security measures as set out in the SOP. Pollution prevention and control measures as set out in SOP. Staff will be trained in accordance with procedures within the SOP.	Low
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces and local environment.	Equipment breakdown resulting in accidental fire causing release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from and via surface water drains and ditches.	Low	High	High/Medium	Permitted waste types are inert and therefore there is only a low risk from the waste itself. All plant and equipment on the site are checked and maintained as part of a maintenance regime. All plant and equipment are maintained in line with manufacturers specifications.	Actions will be taken to fix plant / equipment in the event of a failure / breakdown to address the incident as quickly as possible. Management will decide if operations will be paused or ceased. This decision will be largely based on if the plant is integral to the operation and likely to pose a wider concern to the site and/or the environment. Pollution prevention and control measures as set out in SOP. Staff will be trained in accordance with procedures within the SOP.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
Local human population – residents in residential area of Bromsberrow Heath, workers and visitors to nearby workplaces and local environment. Buildings and buried services.	Landfill gas generated from the waste mass.	Asphyxiation, explosion	Lateral migration, direct release to atmosphere	Low	High	High/Medium	There will be negligible quantities of biodegradable matter within the fill, and the probability of it providing a significant source of landfill gas is very low.	Strict waste acceptance procedures will be implemented on the Site to ensure that only suitable waste types are accepted onto the Site. Presence of artificially enhanced geological barrier will reduce likelihood of later migration of any landfill gas off site. Landfill gas action plan to be followed if significant concentrations of landfill gas detected in monitoring boreholes.	Low
All surface waters close to site.	Equipment breakdown causing loss of containment resulting in the spillage of polluting liquids to water or land.	Contaminated water washed off site causing contamination of buildings, gardens, watercourses, and natural habitats.	Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	High	High/Medium	Wastes to be accepted at the Site are solid and inert. Potential for spillage from any fuel and oil storage for machinery or directly from machinery operating on the Site. Surface water features are over 300m from the boundary.	No point source discharges to controlled waters. Plant and machinery will be maintained in accordance with the manufacturer's instructions. Spillage response procedures as set out in SOP. Pollution prevention and control measures as set out in SOP. Staff will be trained in accordance with procedures within the SOP.	Low
All surface waters close to site.	Rogue loads may result in accidental acceptance of hazardous substances or high	Pollution of water or land through contaminated water. Risk of fire if materials	Direct run-off from site across ground surface, via surface water drains,	Low	High	High/Medium	Strict waste acceptance procedures will be implemented on the Site. Surface water features are over	Landfill engineering including an artificially enhanced geological barrier are proposed in the ESSD. Pollution prevention and control measures as set out in SOP.	Low

Receptor	Source	Harm	Pathway	Probability of Exposure	Consequence	Magnitude of Risk	Justification for magnitude	Risk Management	Residual Risk
	concentrations of non-hazardous pollutants in materials.	are combustible.	ditches etc. Air transport of smoke. Spillages and contaminated firewater by direct run-off from and via surface water drains and ditches.				300m from the boundary.	Staff will be trained in accordance with procedures within the SOP.	

5 Conclusions

The risk assessment presented here concludes that the residual risks to the receptors identified from the hazards identified are 'Low' or 'Very Low', assuming that the risk management measures identified are followed.

The proposed operational management controls are considered adequate to constrain any potential impacts relating to odour, noise, vibration, dust, mud, litter, pests and vermin.

The risks to controlled waters have been addressed in detail in the HRA completed as part of the EP application, which concludes that there is unlikely to be a significant risk posed to groundwater or controlled waters from the proposed operations.

The Site will be operated in accordance with an SOP (Stantec, 2024a) which addresses both the operation and management of both the mineral extraction and proposed restoration by inert landfill (i.e. infilling) activities at the Site.

It is therefore concluded that with the use of appropriate mitigating controls, the proposed inert landfill operations on the Site will not present a significant risk to identified sensitive receptors.

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Stantec, 2024b. Bromsberrow North Sandpit: Environmental Setting & Site Design, January 2024. Report reference 331201261R2.

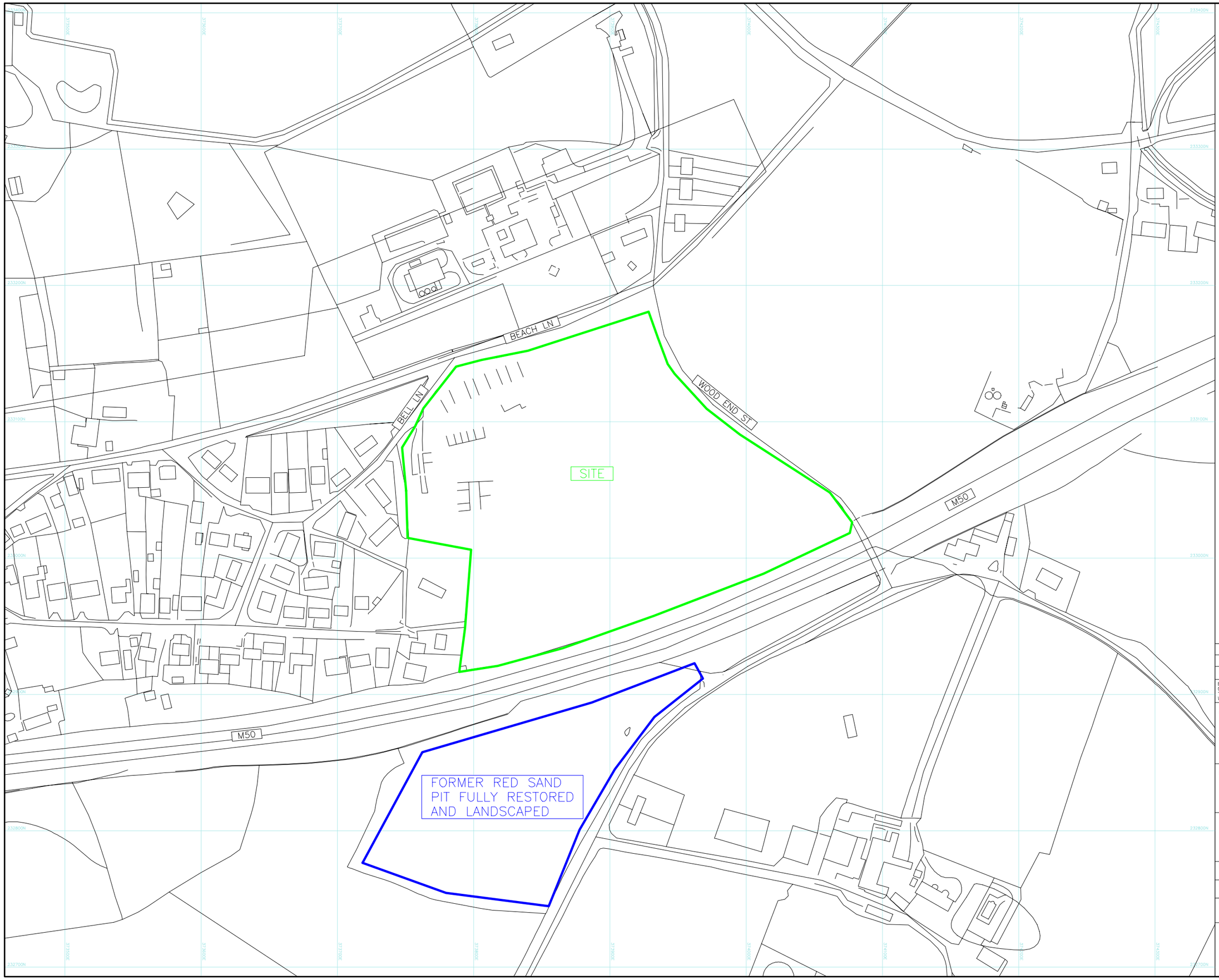
Stantec, 2024c. Bromsberrow North Sandpit: Dust and Emissions Management Plan, January 2024. Report reference 331201261R8.

Stantec, 2024d. Bromsberrow North Sandpit: Hydrogeological Risk Assessment, January 2024, Report reference 331201147R3.

Stantec, 2024e. Bromsberrow North Sandpit: Landfill Gas Risk Assessment, January 2024. Report reference 331201261R6.

DRAWINGS

Site Location Plan	Drawing No. 21-248-D-010 Rev 02
Sensitive Receptors Plan	Drawing No. 331201261D2



Rev.	Revision Detail	Drawn	Date
02	Former red sandpit update	RB	07/11/23
01	First Issue	RB	28/04/22

CLIENT:
ALLSTONE SANDS GRAVELS AGGREGATES TRADING CO. LTD

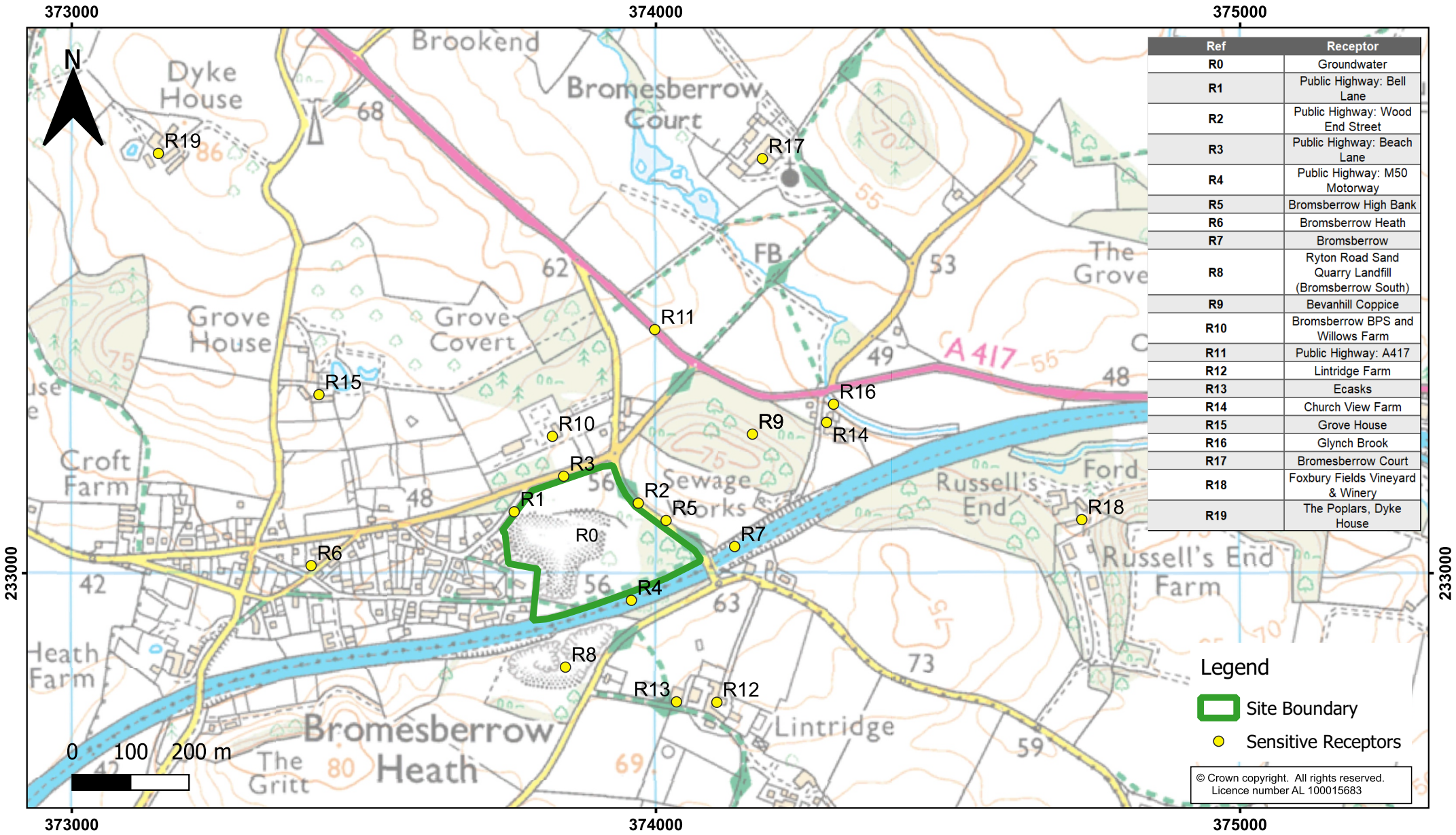
PROJECT:
BROMSBERROW QUARRY

TITLE:
SITE LOCATION PLAN

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE: 1:2500	ORIGINAL SHEET SIZE: A3	STATUS: FINAL

DRAWING NO. 21-248-D-010 REVISION: 02

KEY GEOSOLUTIONS LTD
NOVA HOUSE
AUDLEY AVENUE
NEWPORT
SHROPSHIRE TF10 7DW
TEL: 01952 822960
E-MAIL: INFO@KEYGS.COM
WEB: WWW.KEYGS.COM



Ref	Receptor
R0	Groundwater
R1	Public Highway: Bell Lane
R2	Public Highway: Wood End Street
R3	Public Highway: Beach Lane
R4	Public Highway: M50 Motorway
R5	Bromsberrow High Bank
R6	Bromsberrow Heath
R7	Bromsberrow
R8	Ryton Road Sand Quarry Landfill (Bromsberrow South)
R9	Bevanhill Coppice
R10	Bromsberrow BPS and Willows Farm
R11	Public Highway: A417
R12	Lintridge Farm
R13	Ecasks
R14	Church View Farm
R15	Grove House
R16	Glynch Brook
R17	Bromesberrow Court
R18	Foxbury Fields Vineyard & Winery
R19	The Poplars, Dyke House

Drawing No. 331201261D2

Sensitive Receptors Plan

Date	2023	Drawn	CAB
Scale	As shown	Checked	GW
Original	A4	Revision	2

File Reference

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Stantec