Caulmert Limited

Engineering, Environmental & Planning Consultancy Services

Wasperton Farm Quarry Recovery Permit

Smiths Concrete Limited

Environmental Permit Application

Environmental Risk Assessment

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Environmental Risk Assessment

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1.0 INTRODUCTION

1.1 Application Overview

1.1.1 Caulmert Limited have been appointed by Smiths Concrete Limited ('the Operator') to prepare a new bespoke environmental permit application for a waste recovery operation at Wasperton Farm Quarry ('the Site'), located within an agricultural area in the vicinity of Holloway Farm and Wasperton Farm, close to the town of Barford, Warwickshire.

1.1.2 The Operator proposes to import inert wastes to the Site in order to achieve the required restoration levels.

1.1.3 It is proposed to accept up to 1.2 million tonnes of inert wastes in order to complete the site. The quarry will be worked in a phased manner (a total of 12 phases) and reinstated using imported inert materials to recreate agricultural land, together with a new area of ecological habitat on a proposed silt lagoon.

1.2 Document Structure

1.2.1 This report is an Environmental Risk Assessment which forms part of the environmental permit variation application for the site.

1.2.2 This risk assessment considers any potential risks associated with the proposed operations to sensitive receptors. It is expected that the risks will be low (with controls in place) with respect to odour, pests, dust, litter, noise, and other fugitive emissions and accidents from site operations.

1.2.3 This risk assessment has been compiled in accordance with the current Environment Agency guidance 'Risk Assessments for your Environmental Permit' (last updated 31st August 2022).

1.3 Site Setting and Location

1.3.1 The Site sits at Wasperton and Holloway Farms, to the south of the village of Barford. The centre of the Site can be found at OS Grid Reference SP27479 59454. The Site location and boundary is shown in drawing ref. LD135-WSP-001b and drawing ref. LD135-WSP-024.

1.3.2 The Site is currently used for arable farming with a mix of crops being grown. Also within the Site are a number of small tree blocks, which are a mix of natural and planted areas.

1.3.3 Current access is from the A429 Warwick to Wellesbourne Road via 3 existing entrance points, at Wasperton Farm, Holloway Farm and an access/bridleway that links Marl Pit Cottages opposite Wasperton village.

1.3.4 To the north of the Site is Wasperton Lane, with Barford village centre being further north of Wasperton Lane. To the east, the land rises to Wasperton Hill. To the south the land is generally flat farmland falling very gently to the Thelsford Brook. The western boundary is

formed by the A429 Wellesbourne Road, with Wasperton village sitting to the west of the road between the A429 and the River Avon.

1.3.5 The site location is shown below in Figure 1:

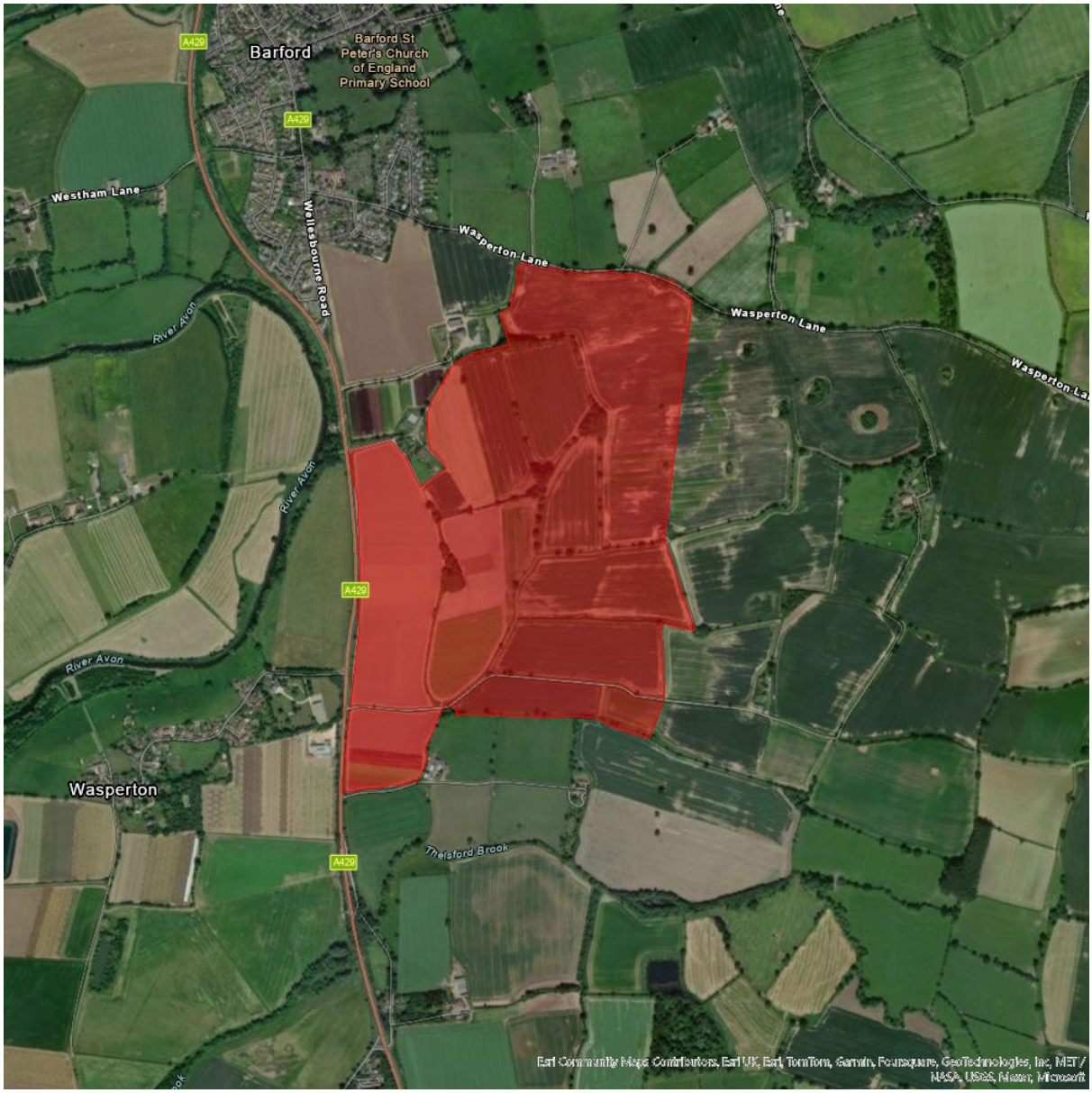


Figure 1 – Site Location (permit boundary outlined in red)

1.4 Proposed Activities

1.4.1 The Site is being developed as a sand and gravel quarry by Smiths Concrete Limited in an area between Wasperton Farm and Holloway Farm.

1.4.2 As part of this, the Operator proposes to import 1.2 million tonnes of inert waste materials to return a larger part of the site to agricultural land after quarrying, in 12 phases and restoring the site to the required restoration levels.

1.4.3 Imported inert materials will undergo strict waste acceptance procedures prior to being accepted into the recovery operation.

2.0 SENSITIVE RECEPTORS

2.1 Overview

2.1.1 This report assesses the potential risks to nearby sensitive receptors from the proposed restoration activities at Wasperton Farm Quarry. A sensitive receptor search has been conducted of the surrounding area within 1km radius of Wasperton Farm Quarry using Defra's Magic Maps website[1] and other publicly available sources. The sensitive receptors identified are listed below in Table 1 and shown on the attached 'Sensitive Receptor Plan' drawing ref. 5526-CAU-XX-XX-DR-V-1801. The distance to each receptor is measured from the Wasperton Farm Quarry permit boundary ('the Site').

2.1.2 The receptor search radius in relation to the site boundary are shown below in **Figure 2:**

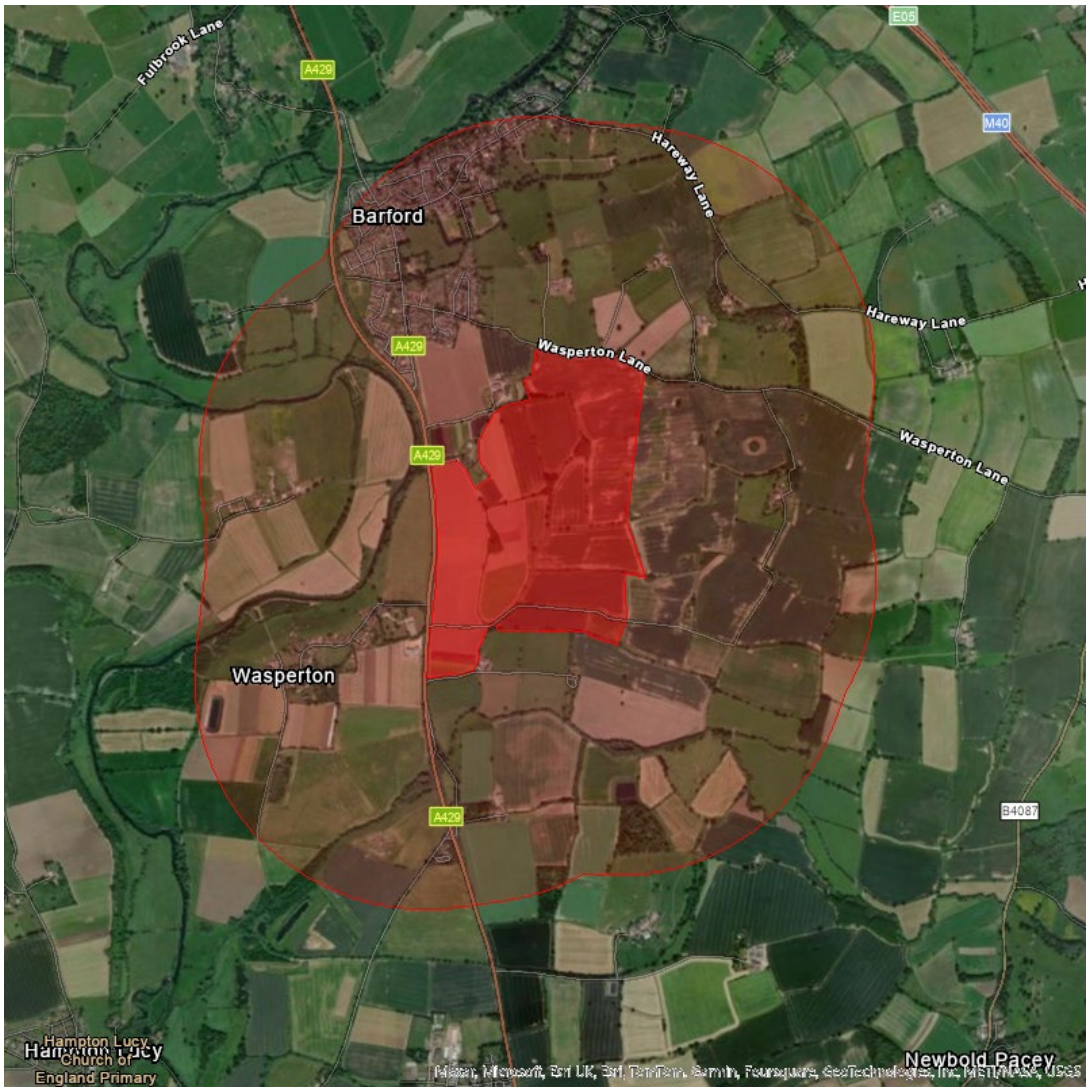


Figure 2 – 1km radius from the site boundary.

[1] DEFRA Magic Maps 2021: https://magic.defra.gov.uk/MagicMap.aspx

2.1.3 The site is located adjacent to Holloway and Wasperton Farms (both situated along the northern perimeter), and Glebe Farm is located on the southern boundary. The closest human receptors are workers, visitors, and residents on the aforementioned tenanted working farms and also in The Forge Cottage and Bradshaw Farm to the northwest and west. The largest potential group of sensitive receptors are the residential and commercial properties in Barford Village, the closest approximately 325m north and 480m west, particularly those residing along Wellesbourne Road, Wasperton Lane, Sandy Lane, and Dugard Place. Additional potential receptors include users of the A429 Wellesbourne Road as it forms the western boundary of the site and is the primary access road to the site. There are no hospitals within 1km of the site. The closest school is 670m north of the site boundary.

2.2 Designated Sites of Ecological Importance & Other Habitats

2.2.1 There are no statutory ecological designations within 1 km of the site boundary. The primary site of ecological importance abutting the site is the River Avon, located approximately 90 m from the western boundary, as well as tributaries located within the northern areas of the site itself. The river is designated as a Local Wildlife Site (LWS) and serves an important function as a habitat corridor.

2.2.2 Firtree Hill is a deciduous woodland located approximately 800m south-east of the site, and there is an area of improved grassland approximately 900 m south-west of the site boundary. The remaining ecological designations within the 1 Km radius include Wasperton Farm (arable land favoured by lapwing), St John the Baptist Churchyard (moderately species rich churchyard), Watchbury Hill (ungraded nature conservation site), and Rushy Close (broadleaved plantation of poplar), all designated as non-statutory Ecosites.

2.2.3 Within 2km of the site boundary, there are no Sites of Scientific Interest (SSSI), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Nature Reserves (NNRs), Ramsar sites or Areas of Outstanding Natural Beauty (AONBs). The Site is not within a Source Protection Zone (SPZ), with the closest (Zone II subsurface activity SPZ) 570m to the south. The closest Ancient Woodland designation is Hampton Wood, located 1.4km to the west.

2.3 Summary of Identified Sensitive Receptors

2.3.1 A summary of the identified sensitive receptors within 1km is detailed in Table 1 below. The distance to each receptor is measured in metres from the closest part of the site boundary.

Table 1 – Summary of Sensitive Receptors within 1km of the site boundary

Receptor	Receptor Type	Distance/Direction
River Avon	Local Wildlife Site (LWS) / Surface Water	On-site and 90m W
Users of footpaths/bridleways	Public Footpaths	Crossing Site on E and S, 5m S
Users of Wasperton Lane	Public Road	5m N

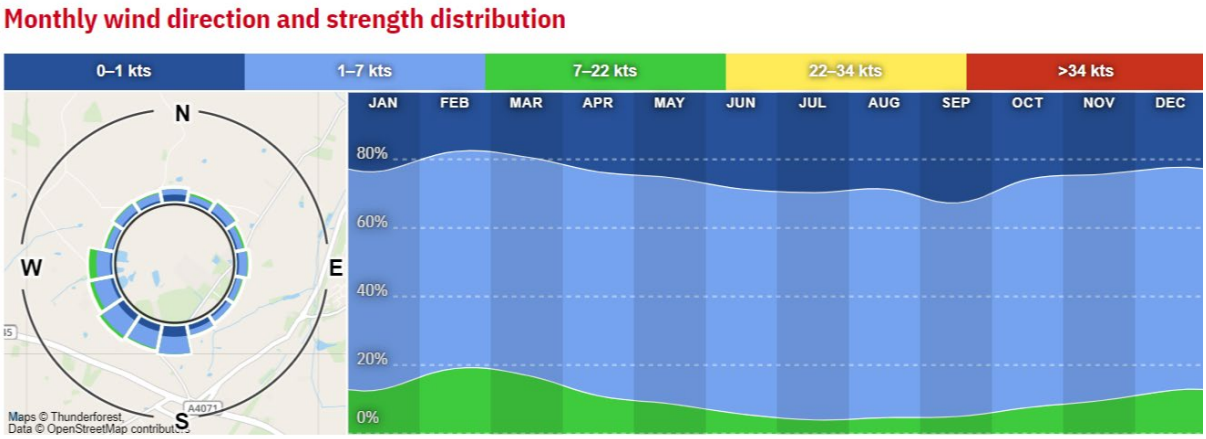
Receptor	Receptor Type	Distance/Direction
Holloway Farm	Residential / Agricultural	5 m N
Glebe Farm	Agricultural / Residential	10 m E & S
Thelsford Brook	Surface Water	20m SE
Wasperton Farm	Residential / Agricultural	40m N
The Forge Cottage	Residential	55 m NW
Bradshaw Farm	Residential	60m W
Houses off Dugard Place / Wasperton Lane, Barford	Residential	160m NW, 290 m NW
Seven Elms Barn (Office)	Commercial	180m S
Wasperton House	Residential	190 m SW
Middle Watchbury Farm	Recreational	225m N
Marl Pit Cottages	Residential	250m E
Houses in Wasperton Village	Residential	270m W
Houses off Sandy Way, Barford	Residential	325 m N
Allotments	Recreational	360m NW, 445m W
St. John the Baptist Church	Recreational	400m W
Houses off Wellesbourne Road / Brembridge Close, Barford	Commercial / Residential	480m W
Watchbury Hill	Residential	500 m NE
Barford House	Residential	515m NW
Lower Watchbury Farm	Recreational	520m NE
The Green Barn House	Commercial	560m NE
Thelsford Farm	Residential	570m S
Barford School (Playing Field)	Residential	575 m N
Firtree Hill Spinney	Woodland Habitat	600 m S
St. Peters Church	Recreational	615m N
Barford School (main building)	Residential	670m N
Wasperton Hill	Commercial	670 m E
Grovefields House	Residential	730m W
Thelsford Cottages	Residential	730m S
Barford Village Centre	Residential	770 m NW
Rushy Close Spinney	Woodland Habitat	800 m SE
Woodlands House	Commercial	920m NE

2.4 Meteorological Setting

2.4.1 Fugitive emissions of dust, litter, odour and noise from the site are likely to be affected by local weather conditions, in particular by wind direction and strength.

2.4.2 The closest meteorological station to the site actively recording wind statistics is Lawford Heath/Rugby, located over 22 km northeast of the Site. Wind statistics from this weather station are considered to be representative of the typical conditions at the site (see Figure 2 below).

2.4.3 A review of the data recorded daily between November 2008 and June 2023 on the Windfinder.com website[2] indicates that the prevailing wind direction is from the southwest towards the northeast. Therefore, there is limited potential fugitive emission propagation towards the majority of sensitive receptors which are located northwest of the site, including the nearby village of Barford. To the northeast, there are only a few farms and homesteads downwind of the proposed operation, which are at some distance (over 500m) from the site.



2.4.4

Figure 2 – Lawford Heath / Rugby wind statistics – average wind direction & strength 2008 to 2023

[2] Windfinder website 2023, found here: https://www.windfinder.com/windstatistics/lawford-heath_rugby

Figure 3 – The direction towards which the prevailing wind is blowing (NE) in relation to the site.

3.0 RISK ASSESSMENTS

3.1 Assessments for the Proposed Operations

3.1.1 Risk assessment tables have been completed for odour, noise and vibration, fugitive emissions (dust, litter, mud and debris, pests and surface water run-off), visible plumes and accidents in line with the GOV.UK guidance 'risk assessments for your environmental permit' (last updated 31st August 2022).

3.1.2 It is considered that the biggest risk associated with the permitted operations are emissions resulting from dust, and noise, however all emissions have been considered in detail.

3.2 Risk Assessments - Tables

3.2.1 Possible hazards as a result of the proposed operations at the site that require risk assessment comprise:

- Table 2 - Sources of Odour.
- Table 3 - Sources of Noise and Vibration.
- Table 4 - Fugitive Emissions (dust, litter, mud and debris, pests, surface water run-off).
- Table 5 - Visible emissions (smoke or visible plumes).
- Table 6 - Accidents (leaks and spillages, fire etc).

3.2.2 The hazards identified above have the potential to escape beyond the site boundary and cause an amenity nuisance to sensitive receptors or harm the environment and human health. For each possible hazard, an assessment of the risk that it poses to potential sensitive receptors has been carried out, considering the control measures that will be in place.

3.2.3 The following Tables 2 to 6 give further detail on each hazard source, pathway and sensitive receptor, the risk management measures to be implemented, probability of exposure, consequences of exposure and an overall risk rating from Low (little or no risk) to High once all risk management measures have been taken into account.

Table 2 – Odour Risk Assessment

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Odour from any incoming waste materials.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary) and nearby footpaths.	Via air.	Due to the nature of the inert waste types to be accepted at the site, they are very unlikely to generate odours. Waste acceptance procedures at the site will prevent odorous wastes being accepted – only inert waste types listed in the permit will be accepted which are inherently not odorous, nor unlikely to contain biodegradable or putrescible materials that could release odours. Daily site inspections will include checks to assess that odours from site operations are not excessive beyond the site boundary. In the unlikely event any non-conforming wastes are discovered in a waste load after checking and depositing at the site, the following will be done: • The load will either be immediately reloaded onto the delivery vehicle and rejected from site. • Or the load will be temporarily stored in a quarantine holding area. The quarantine	**Unlikely** - due to strict waste acceptance procedures and permitted inert waste types unlikely to generate odours. Odour is transient in nature which means any odour will dissipate with distance and wind movement outside.	Odour may cause an amenity nuisance/disturbance to local people.	**Low – if control measures are implemented**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
			area will be outside and well ventilated. The quarantined waste will be removed from site as soon as possible. All measures and responsibilities to be outlined in the management system for the site.			

Table 3 – Noise & Vibration Risk Assessment

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Noise and vibrations from vehicle movements and off-loading of waste.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary). Wildlife in nearby woodland, fields and designated habitats including the River	Through air and ground.	A Noise Impact Assessment was completed by WBM Acoustic Consultants in September 2021 (Appendix 2). The baseline noise survey considered infilling operations and concluded the calculated site noise levels for routine operations comply with the suggested daytime noise limits based on government guidance for minerals operations. It is considered that the impacts of noise and vibration beyond the site boundary is unlikely. All site operations will be carried out within the normal site operational hours (07:00 – 17:00 Monday – Friday, 07:00 – 12:00 Saturday, No activity on Sundays or public and bank holidays).. Daily site inspections will include checks to assess that noise and vibration from site operations are not excessive beyond the	**Moderately likely** – noise and vibrations will not be excessive beyond the site boundary. Low level noise may be audible beyond the site boundary. The noise is likely to consist of continuous low level site plant noise and intermittent traffic noise during site operational hours only.	Noise may cause annoyance to people in nearby residential areas or passing the site on roads.	**Low – if control measures are implemented**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
	Avon LWS (90 m west).		site boundary. All staff will have an awareness of noise levels and will report to site management any excessive noise levels. The Site Manager/Nominated Deputy will make a general observations of audible noise emissions and record any excessive noise levels in the site diary and operations at the time. Drop heights when unloading and moving materials will be minimised to reduce the potential for generating noise and vibration emissions. Delivery drivers will be informed of these requirements upon entering site. Site vehicle engines will be turned off when idle and excessive revving will be discouraged. Site speed limits will be enforced to reduce noise from vehicles. Site surfacing and roads will be maintained, and potholes will be filled and inspected to ensure the road surfaces are kept in good condition to reduce noise and			

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
			vibration from the rolling and shaking of the vehicle upon impact with the potholes. Plant and machinery will be serviced regularly and maintained in accordance with manufacturer's specifications in order to ensure noises potentially caused by damaged or poorly maintained equipment are kept to a minimum i.e. engines running smoothly, moving parts kept lubricated to reduce rattling or rubbing sounds etc. The management plan for the site will include procedures to minimise noise from the operations on site. Fully trained and competent plant operators, and/or trainees under supervision to operate machinery.			

Table 4 – Fugitive Emissions Risk Assessment

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Dust						
Release of dust and particulate matter from movement of site vehicles and plant undergoing restoration activities. Dust from off-loading waste.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary). Wildlife in nearby woodland, fields and designated habitats including the River	Through air – wind borne.	The management plan for the site will include procedures to minimise dust from all the operations on site. A Dust Management Plan (document ref: 5526-CAU-XX-XX-RP-V-0304) is in place for the site and forms part of the site management system. This includes control measures in place at the site. Specific measures taken to prevent dust emissions from these activities: • Excessively dusty waste loads or wastes consisting solely or mainly of dusts are to be excluded from site, in accordance with the permit. • Drop heights should be minimised when loading and unloading wastes. • Daily site inspections will include visual monitoring for dust from the waste treatment and storage areas.	**Moderately likely** - nearby residential receptors close to boundary of site. Dust will be managed by strict waste acceptance procedures and trained staff conducting site inspections.	Dust may cause annoyance to people by settling on clothing, cars and buildings nearby. Potential smothering of flora and fauna inhibiting photosynthesis in nearby sensitive habitats.	**Low – if control measures implemented.**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
	Avon LWS (90 m west).		• All site staff will be trained in visual dust inspections and notify site management immediately if a dust issue arises at the site. • Site roads will be assessed for potential to cause dust emissions and if needed site roads will be wetted using clean water as appropriate or cleaned by a road sweeper. • Site vehicles will use the wheel wash facility upon leaving the site to prevent waste debris or dust-causing deposits from building up on public roads adjoining the site. • Ensure that all vehicles leaving the site have their load securely sheeted to prevent dust and fine particles being blown from their vehicles. • Temporary stockpiles of material will be dampened down, especially during dry & windy weather. In the event of dust emissions from the site being detected: - • The incident must be reported to the site manager.			

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
			• A record must be made of the incident and actions taken. • Waste storage and handling procedures should be reviewed, and additional dust control measures imposed as deemed necessary by the site manager.			
Surface Water Run-off						
Run off from inert waste areas into surface water and groundwater receptors.	Surface waters downstream of site including River Avon (LWS) approx. 90 m from western boundary, in addition to the tributary within the northern area of the site, and the onsite and nearby natural ponds. Site lies on an unproductive aquifer and not within a	Surface run-off/overland flow and infiltration down into ground.	The management procedures for the site will include measures and site infrastructure (i.e. settlement pond) to minimise the risk of run-off that contains suspended solids being discharged to surface water. Surface water run-off from application area will drain into settlement pond before discharging into surface water, therefore reducing significantly the suspended solids loading. Only inert waste types to be accepted which will have negligible contaminant or leaching potential.	**Unlikely –** due to strict waste acceptance criteria and procedures and use of settlement pond.	Detriment to the quality of surface water could affect fish and other wildlife within the watercourse. Contamination of surface water and groundwater..	**Low – if control measures are implemented.**

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What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
	Source Protection Zone (SPZ).					
Pests						
Rats/flies/birds and other pests carrying pathogens or harmful microorganisms.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary). Wildlife in nearby woodland, fields and designated habitats	Rats or other pests migrating onto nearby premises, then humans or farm animals getting into contact with them.	Provided that the waste acceptance procedures are adhered to, the risk from pests is minimal. Due to the nature of the inert waste types to be accepted at the site, they are very unlikely to attract pests. Only permitted inert waste types accepted which are unlikely to contain biodegradable or putrescible materials likely to attract pests. Daily site inspections will include checks to assess that pests are not an issue on site. Non-conforming waste loads brought to site that contain putrescible materials or infestations of pests i.e. flies, will be rejected from site.	**Unlikely –** nature of inert wastes will not attract pests.	Nuisance to human population and vermin are vectors of pathogens i.e. Weils Disease.	**Low – if control measures are implemented.**

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	including the River Avon LWS (90 m west).					
Mud/Litter						
Mud and debris from delivery and collection vehicles.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary).	Deposited by waste delivery vehicles tyres entering and leaving site.	Daily site inspections by trained site staff to assess site roads potential to mud and debris emissions and if needed site roads will be cleaned by a road sweeper. Drivers of vehicles entering and leaving the site will be trained in checking their vehicle for build-up of mud and debris and to take measures to reduce this prior to leaving. A road sweeper will be employed to clean adjacent public roads around site if this is identified as a problem. Good housekeeping will be maintained around site, with mud & debris regularly swept up. Any accidental spillages of waste on the site roads will be cleaned up immediately or temporarily fenced off prior to clean up to prevent site vehicles tracking debris off-site.	**Moderately likely** -potential for mud and debris to be tracked from unsurfaced area on site onto surfaced haul road and off-site onto public roads. However, vehicles leaving site and external roads will be monitored and cleaned.	Nuisance and possible safety issues to other road users.	**Low – if control measures implemented.**

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	Wildlife in nearby woodland, fields and designated habitats including the River Avon LWS (90 m west)					
Litter from incoming wastes.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary).	Via air (windblown) and across ground	Strict waste acceptance procedures will be adhered to, to ensure only inert waste types are accepted as per the permit and these will not contain litter. Waste loads found to be containing litter or not conforming to the permitted waste list during waste acceptance checks will be rejected from site. Daily site inspections by trained staff will identify if litter is on site and escaping site boundary. If litter is present, it will be reported to the site manager, litter picking will be arranged, and the source investigated and recorded in the site diary.	**Unlikely -** Local residents and users of footpaths often sensitive to litter, however permitted inert waste types have low litter potential and strict waste acceptance procedures will ensure waste loads with litter are rejected.	Nuisance to people nearby and potential pollution of nearby habitats.	**Low – if control measures implemented.**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
	Wildlife in nearby woodland, fields and designated habitats including the River Avon LWS (90 m west).					

Table 5 – Visible Plumes Risk Assessment

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Potential visible plumes.	Nearby receptors.	Air.	N/A –No routine activities carried out will result in visible plumes.	N/A	N/A	N/A

Table 6 – Accidents Risk Assessment

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Spillage or leak of fuel or other hazardous liquids from delivery vehicles and plant on site.	Underlying ground, groundwater, and surface waters and nearby Local Wildlife Sites such as the River Avon.	Through site surface / ground or over land.	Fuels and oils associated with vehicles delivering waste materials to site, vehicles moving around site and stationary plant could potentially leak or spill fuel or oils during use. Vehicles and plant regularly serviced and maintained to manufacturers specifications to ensure no leaks or spillages. All plant, vehicles and machinery will be inspected regularly for leaks. Refuelling will be undertaken in a designated refuelling area provided with impermeable surfacing. Spill kits available on site should there be any leaks or spillages – incident recorded in the site diary and any spill kits replaced. Spillage action plan with training of all relevant staff on implementing the plan	**Unlikely -** very unlikely that any accidental spills or leaks of fuels/oils (small in size) would reach water courses or groundwater.	Pollution to ground below site, groundwaters and potentially surface waters.	**Low – if control measures implemented.**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
			and in the use of spill pads and booms, which will be available. The manager also responsible for review of what caused the spillage/leakage incident and whether changes in procedures are needed as a result.			
Flooding of site	Underlying ground, groundwater, and surface waters and Nearby Local Wildlife Sites such as the river Avon.	Overland flow of flood water.	Inert waste materials to be accepted at site for recovery are not likely to pollute water if caught in flood waters, as they will not be contaminated and have negligible leaching potential. **Actions** in the event of flooding: In the unlikely event of flood warnings for the area, the site manager or technically competent manager should consider the possibilities of moving waste materials or any other materials with hazardous properties (i.e. fuels stored on site). Where flooding could reach areas where electrical equipment is used, electricity to that area should be switched off and isolated.	**Unlikely -** Permitted inert waste types will have low leaching potential.	Nuisance or pollution of nearby water courses.	**Low - if control measures are implemented.**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
			After flood waters have receded, the areas outside the site should be inspected and any materials or litter which has escaped the site boundary should be dealt with appropriately.			
Fire	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Users of nearby A429 Wellesbourne Road (western boundary). Wildlife in nearby woodland, fields and	Air transport of smoke and vapours. Firewater overland.	Fires could occur as a result of arson, self-combustion or from sources of ignition – likely vehicles, plant or temporary buildings. Plant and machinery on site will be maintained and checked regularly as per manufacturers specifications to ensure electrical faults or other issues such as leaking hydraulic oils from damaged pipes are prevented and fires do not break out. Inert restoration materials to be used are inherently not likely to burn. Daily site inspections of storage areas and plant to identify any signs of smoking or smouldering.	**Unlikely -** Permitted waste types to be accepted at site are inert and will not contain combustible fractions. Even with measures in place to prevent the occurrence of fires, it is possible that fires could break out. Measures in place to prevent the fire spreading or to limit its consequences will significantly	Smoke fumes impacting local receptors. Nuisance or pollution of nearby water courses, sensitive habitats (i.e. LWS) and residences.	**Low - if control measures are implemented.**

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
	designated habitats including the River Avon LWS 90 m W.		Site security with fencing and locked gates out of hours will prevent fires caused by arson or vandalism. There will be a No Smoking policy on site. Waste Acceptance at the weighbridge will ensure that hot loads, smouldering, or smoking loads of waste are not accepted. Actions in the event of fire call fire service on 999. Trained site staff and/or emergency fire crews will use water to extinguish any fires on-site and the resulting firewater has the potential to be contaminated and will be contained and disposed of appropriately. Where possible and safe, combustible materials will be isolated from the fire. Inert materials on-site can be used to smother a fire, if safe to do so, using plant and machinery to position material.	reduce the probability of receptors being affected by a fire.		

What do you do that can harm and what could be harmed			Managing the risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Vandalism – damage to site vehicles/plant, and site infrastructure.	Workers and visitors to Wasperton Farm Quarry site. Local human population, residential dwellings nearby (closest 5 m N), and Barford village (closest 325m N). Wildlife in nearby woodland, fields and designated habitats including the River Avon LWS 90 m W.	Over land or by air.	If vandalism to site security, site infrastructure, buildings or vehicles occurs, site management will be informed and emergency procedures as stated in the Management System will be followed, including reporting vandalism to Police and reviewing situation to improve site security. Any potential emissions from site will be dealt with in accordance with the above risk assessments (Tables 2 to 5) to prevent contact with sensitive receptors. Trained site staff will conduct daily site inspections to detect vandalism or vulnerable areas of site likely to be targeted. No unauthorised access to site allowed and all visitors required to sign in and out at weighbridge / site office. All site visitors to be accompanied by a competent member of staff and any trespassers will be escorted off-site once identified.	**Unlikely** – **s**ite bounded by security fences to prevent unauthorised access.	Nuisance to nearby human receptors and pollution to nearby receptors from leaks or spills caused by vandalism.	**Low – if control measure implemented.**

4.0 CONCLUSION

4.1.1 The risk assessments above enable identification of appropriate mitigation measures to control the amenity and accident risks from the proposed activities. All identified risk mitigation measures will be incorporated within the management system for the site.

4.1.2 The risk assessments indicate that provided the identified risk mitigation measures, which are identified in the tables above, are implemented at the site, the risk of nuisance or pollution from odour, noise and vibration, fugitive emissions including dust, litter, mud and debris, contaminated surface run-off, pests or accidents such as fire and spillages is low.

4.1.3 Also included within this permit application are the following documents relating to potential emissions from the site:

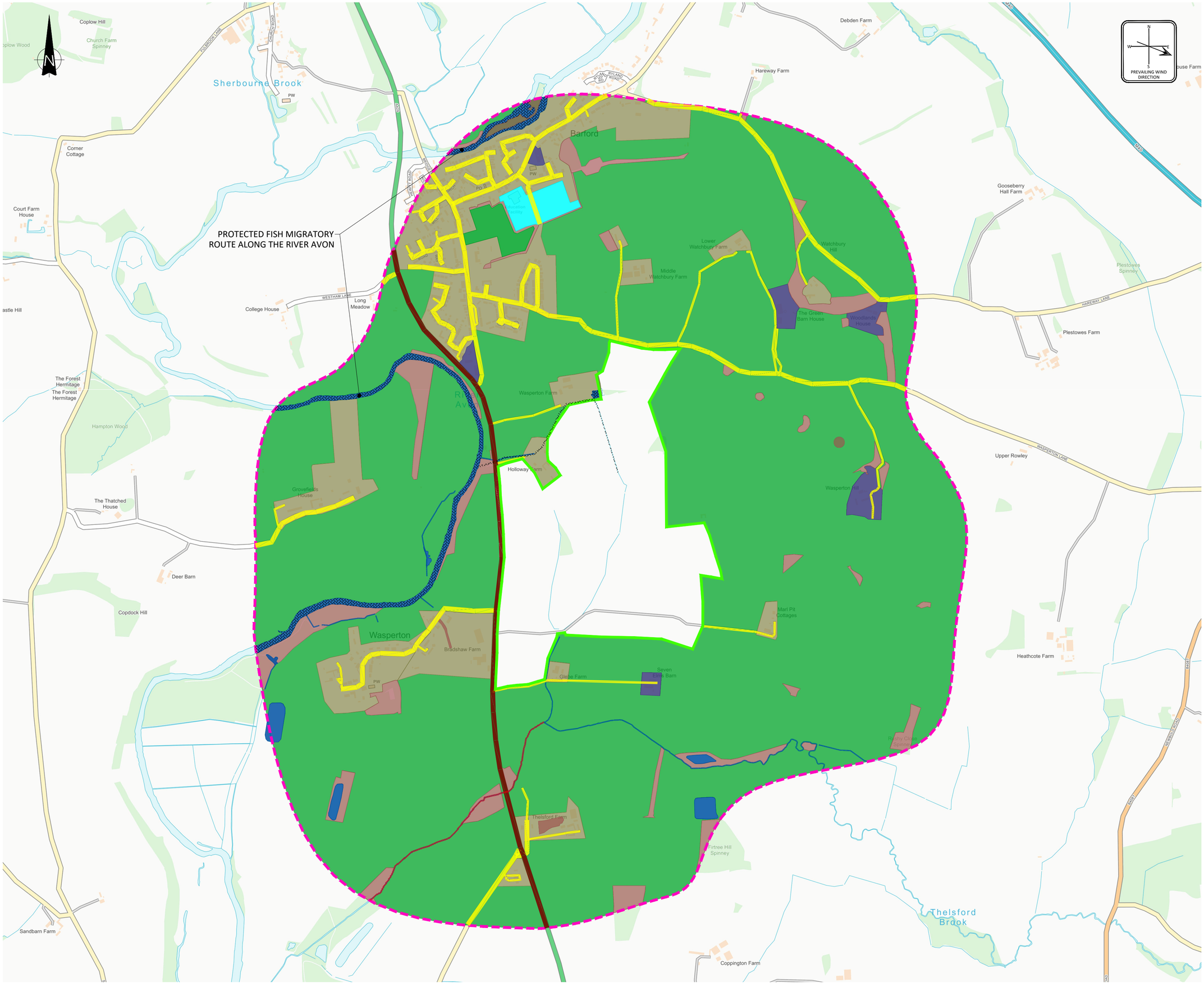
- Dust & Emissions Management Plan ref. 5526-CAU-XX-XX-RP-V-0304.
- Hydrogeological Risk Assessment ref. 5526-CAU-XX-XX-RP-V-0305.

5.0 REFERENCES

1) Environment Agency guidance 'Risk Assessments for your environmental permit' (last updated 31st August 2022), found at: https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit.

DRAWINGS

5526-CAU-XX-XX-DR-V-1800 Sensitive Receptor Plan



LEGEND

- PERMIT BOUNDARY
- 1000m OFFSET
- SURFACE WATER
- WOODLAND / SCRUBLAND
- COMMERCIAL
- EDUCATIONAL FACILITY
- INDUSTRIAL
- RESIDENTIAL
- MAJOR ROAD
- MINOR ROAD
- RAIL
- LOCAL WILDLIFE SITES

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	SH	SH	26.07.23

PURPOSE OF ISSUE: FOR INFORMATION — STATUS: S2

CLIENT: Smiths CONCRETE

PROJECT: WASPERTON FARM QUARRY

TITLE: SENSITIVE RECEPTORS PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
EJD	EJD	SH	SH

DATE	SCALE @ A2	JOB REF:	REVISION
25.07.2023	1:10000	5526	P01

DRAWING NUMBER: 5526-CAU-XX-XX-DR-V-1801

Caulmert engineering environmental planning

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APPENDIX 1

EA Conservation Screening Report

Nature and Heritage Conservation

Screening Report: Bespoke Waste

Reference	**EPR/KP3525SG/P001**
NGR	**SP 27462 59542**
Buffer (m)	**350**
Date report produced	**13/07/2023**
Number of maps enclosed	**2**

The nature and heritage conservation sites and/or protected species and habitats identified in the table below must be considered in your application.

Nature and heritage conservation sites	Screening distance (m)	Further Information
Local Wildlife Sites (LWS) **River Avon and Tributaries**	200	Appropriate Local Record Centre (LRC) Appropriate Wildlife Trust

Protected Species	Screening distance (m)	Further Information
European Eel **Code 2**	up to 500m	Natural England Appropriate Local Record Centre (LRC) National Biological Network (NBN) Environment Agency. Dial 03708 506 506 for your local Fisheries and Biodiversity team

Unfortunately we cannot provide you with the details of all protected species. This is because we either have not been given permission by the owner of the species data, or they have asked us not to identify the species as they are vulnerable. In these instances you must contact the relevant organisation listed above. A small administration charge may be incurred for this service.

Where protected species are present, a licence may be required from Natural England to handle the species or undertake the proposed works.

The relevant Local Records Centre must be contacted for information on the features within local wildlife sites. A small administration charge may also be incurred for this service.

Please note we have screened this application for protected and priority sites, habitats and species for which we have information. It is however your responsibility to comply with all environmental and planning legislation, this information does not imply that no other checks or permissions will be required.

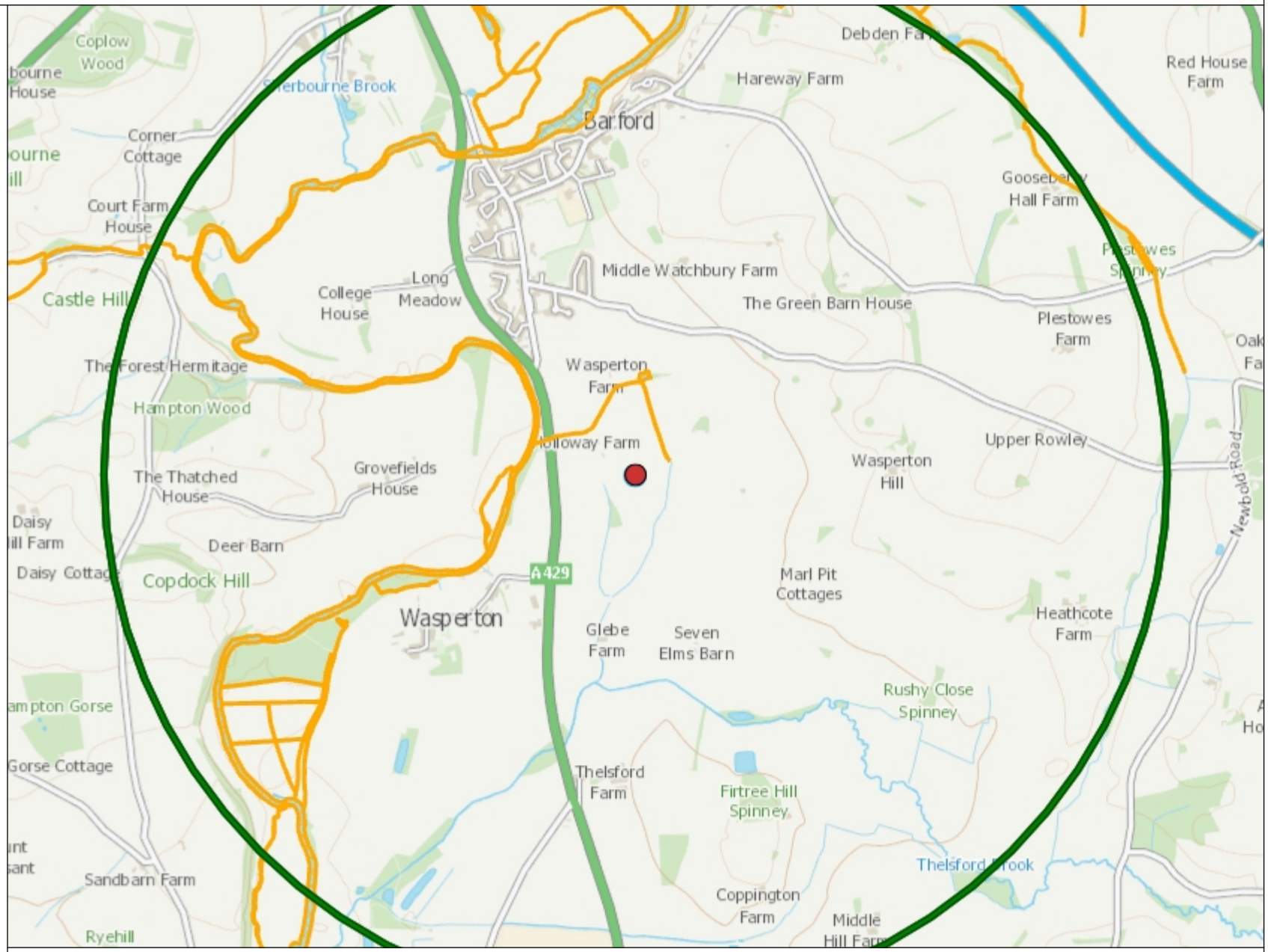
Please note the nature and heritage screening we have conducted as part of this report is subject to change as it is based on data we hold at the time it is generated. We cannot guarantee there will be no changes to our screening data between the date of this report and the submission of the permit application, which could result in the return of an application or requesting further information.

Local Wildlife Sites

Environment Agency

Legend

Local Wildlife Sites



1: 25,000

0 625

Metres

N W E S

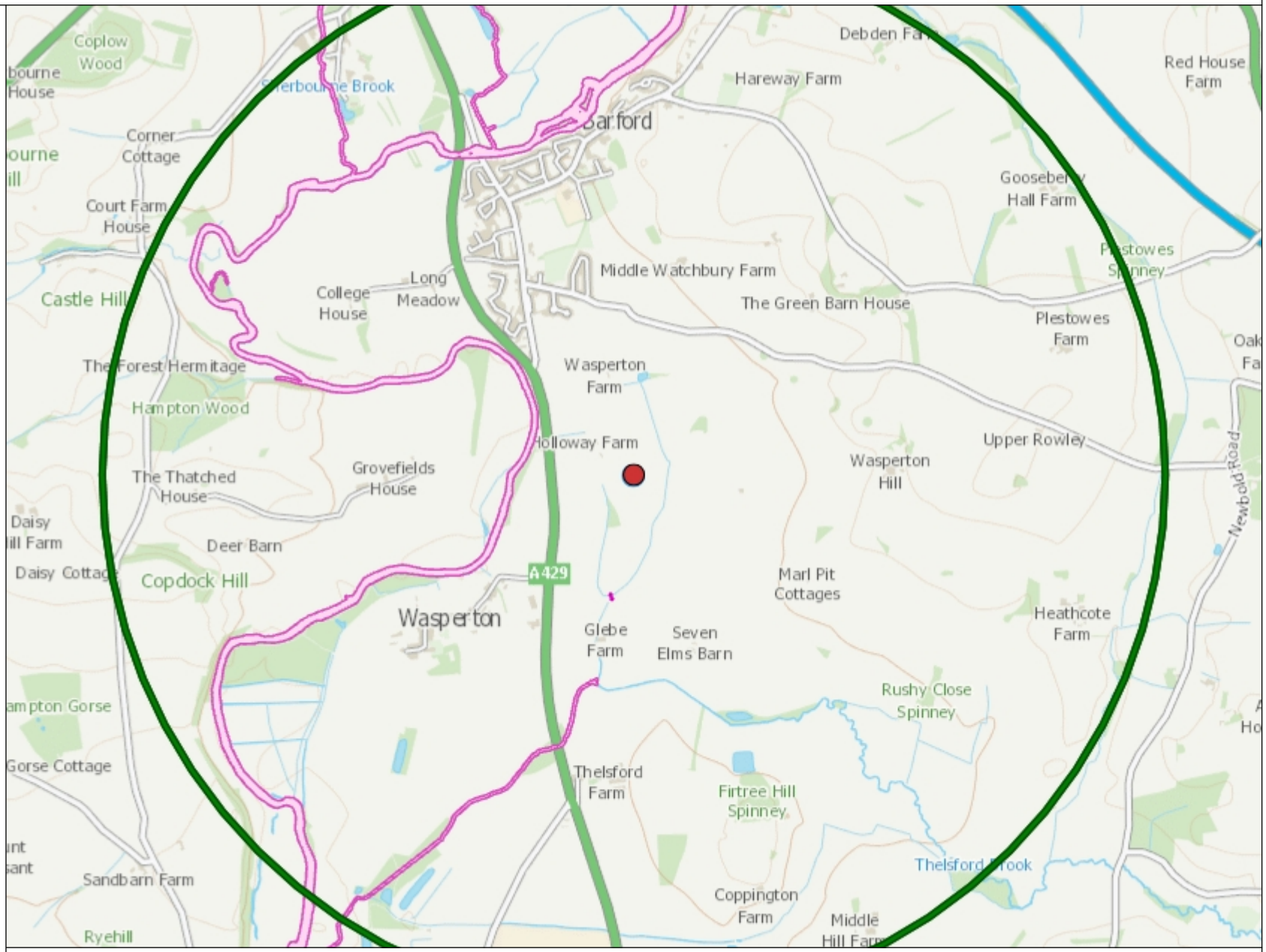
Protected Species

Environment Agency

Legend

Protected species screened for Env Permits - complete set

- Protected species, non fish
- Protected fish
- Protected fish migratory route



1: 25,000

0 625

Metres

N W E S

APPENDIX 2

Wasperton Quarry Noise Impact Assessment - Jan 22

01604 771101 | hq@wbm.co.uk | www.wbm.co.uk
Steepleton Lodge Barn, Long Lane, East Haddon, Northamptonshire, NN6 8DU

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Ref **5184**

For **Smiths Concrete Ltd**
Southam Road
Banbury
Oxfordshire
OX16 2RR

Wasperton Quarry
Proposed Sand and Gravel Quarry, Wasperton Farm
Noise Impact Assessment

Date 11 January 2022

Author Sarah Large

The Author

Sarah Large MA (Cantab) MSc Dip (IoA) MIOA (Senior Consultant) obtained a degree in music from Cambridge University in 2007. She has worked in acoustic consultancy since 2009, completing the Institute of Acoustics Diploma in Acoustics and Noise Control in 2010 and a Master of Science degree in Environmental Acoustics from South Bank University in 2012. Sarah has extensive experience in environmental acoustics including noise modelling, noise monitoring and assessments. Sarah joined WBM in 2021 and is working on architectural and environmental acoustic projects including mineral sites.

WBM

WBM (the trading name of The Walker Beak Mason Partnership) is an established independent acoustic consultancy specialising in architectural & building acoustics, environmental noise, planning issues and expert work. WBM is a member of the Association of Noise Consultants and is also a Corporate Member of the Institute of Environmental Management & Assessment. The consultants are members of the Institute of Acoustics.

Document Control

Revision	Description	Date	Prepared by	Checked by
-	Final	11/01/2022	SL	RHC

ACOUSTIC CONSULTANTS

Contents

1 Introduction

WBM has been appointed by Landesign Planning & Landscape Ltd on behalf of Smiths Concrete Ltd to provide a noise impact assessment for a new sand and gravel quarry at Wasperton Farm, Wasperton.

This report sets out the findings of a baseline noise survey undertaken in September 2021 at locations representative of the nearest noise sensitive dwellings and residential areas to the proposed quarry site. Noise criteria for the site are based on the findings of the baseline survey and follow Government advice found in the “Planning Practice Guidance” for Minerals (PPGM) dated March 2014.

Calculated noise levels for both routine and temporary operations are provided and compared to the noise criteria at the nearest noise sensitive dwellings to the site. Mitigation measures, where necessary, have been recommended.

To aid comprehension, a glossary of acoustic terms is presented in Appendix A. Summaries of the guidance documents used in this report are set out in Appendix B.

2 Site Description

Wasperton Farm and the proposed quarry site are located approximately 300m to the east of the village of Wasperton, 600m to the south east of the village of Barford and approximately 5km to the south of Warwick. The immediate locality is characterised by small residential developments, farms and rural / agricultural land. Intermittent agricultural noise, typically farm vehicles and machinery, was noted during one of the noise survey site visits.

The west of the site is bounded by the A429, a main road linking Warwick and Wellesbourne and access to the M40, which is approximately 2km to the north / north east of the site. Road traffic noise was the main source of noise noted during noise surveys at the site and in the surrounding area.

The nearest residential areas to the quarry site are the villages of Wasperton to the east and Barford to the north. A number of isolated dwellings and farms are located around the site, predominantly to the west and south / south east of the site.

A plan of the site and area is provided in Appendix C.

2.1 Proposed Site

The proposal at Wasperton Farm is for a new sand and gravel quarry. Sand and gravel will be extracted from the working area and transported to a central processing area. Processed material will be loaded into road going HGVs for transport off site. Much of the excavation area will then be infilled with inert materials transported to site by road going HGVs. The exception is a large central area which will be a silt lagoon and thus no infilling will take place in this area.

The proposed operating hours are:

- 07:00 – 17:00 hours Monday to Friday
- 07:00 – 12:00 hours Saturdays
- No activity on Sundays, Public Holidays or Bank Holidays

3 Assessment Approach

A summary of the relevant guidance documents for determining noise impact and acceptability of impact is provided below. This is reviewed alongside the existing noise limits for the site and a review of the routine noise monitoring undertaken since 2017.

3.1 Legislation and Planning Policy

The Noise Policy Statement for England (NPSE), published in March 2010, sets out the Government's long term policy for noise and sets three main aims:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The National Planning Policy Framework (NPPF) was published in March 2012 with immediate effect and sets out the Government's planning policies for England. It was updated in July 2018 and February 2019. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development.

With regard to noise there are various aims, including that noise from a new development should avoid giving rise to significant adverse impacts on health and quality of life, and that other adverse impacts should be mitigated and reduced to a minimum including through the use of conditions.

Planning Practice Guidance on Noise (PPGN) was published in 2014 to provide additional guidance on meeting the objectives of the NPPF. The guidance assists in determining whether noise is likely to be a concern and supplements this with a noise exposure hierarchy table setting out noise effect levels, noise response and examples of outcomes and the appropriate action that needs to be taken.

Planning Practice Guidance on Minerals (PPGM) was also published in 2014 and includes advice for obtaining planning permission for minerals extraction and assessment of associated noise emissions. The appropriate standards for noise during normal operations are set out in Paragraph 021, reproduced below.

> *Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq, 1h (free field)}$.*
>
> *For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq, 1h (free field)}$. For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h (free field)}$ at a noise sensitive property.*

Paragraph 022 gives guidance for temporary operations and allows an increased daytime noise limit:

Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq\ 1h\ (free\ field)}$ for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

A summary of the guidance in the NPSE, NPPF, PPGN and PPGM can be found in Appendix B.

3.2 Assumptions and Limitations

The greatest limitation of the assessment and the largest level of uncertainty is whether the proposed activity will give rise to the calculated noise level at the receiver locations (in this case the nearest dwellings) in practice.

The calculations and assessment have been based on all components of the mineral extraction, infilling and processing operations taking place simultaneously. It also assumes that these operations occur for 100% of each hour during the permitted daytime working hours to represent a realistic worst case scenario. In reality, this situation is unlikely to occur and noise levels would, in all likelihood, be lower than those presented in the assessment.

The site noise calculations do not include any allowance for air absorption, which would be minimal in any case and make no difference to the assessment.

The average background sound level obtained from the baseline noise survey was used in the assessment to review site noise limits. The surveys covered a range of wind directions and this was considered to be representative of the background sound level that would be normal for the properties in the vicinity of the site. The full survey results are presented in Appendices D - F and are summarised below.

4 Noise Surveys

4.1 Measurement Description

WBM undertook attended baseline noise surveys during the daytime on 17th and 21st September 2021 and during the night time period of 20th – 21st September 2021. In addition, a data logging sound level meter was installed at Wasperton Farm to continuously measure noise levels between 17th and 21st September 2021. A plan showing the monitoring locations is given in Appendix D.

The baseline noise survey establishes the existing noise climate in the area and forms the basis for noise limits in accordance with Government guidance.

During the first site visit on 17th September 2021 the main sources of noise in the area were from local and distant road traffic with some distant agricultural machinery noise audible at Locations 1 and 2. At night time (20th – 21st September 2021) there was reduced local road traffic though distant road traffic remained the predominant source of noise in the area. At location 2 noise from a water feature was also audible at night time. On the final visit during daytime of 21st September 2021 the main source of noise was again local and distant road traffic noise, though some intermittent aircraft noise was also noted. Birdsong and wildlife noise was noted but was not dominant over that from transportation sources.

The full survey results are presented in Appendices D - F and are summarised below.

4.2 Results

A summary of the measured baseline noise levels is presented in Table 4.1 below.

Table 4.1 – Summary of baseline noise levels

Baseline Survey Level Location	Daytime (07:00-23:00)			Night time (23:00 – 07:00)		
	Average Ambient Sound Level dB $L_{Aeq,15min}$	Average Background Sound Level dB $L_{A90,15min}$	Range Background Sound Level dB $L_{A90,15min}$	Average Ambient Sound Level dB $L_{Aeq,15min}$	Average Background Sound Level dB $L_{A90,15min}$	Range Background Sound Level dB $L_{A90,15min}$
A: Wellesbourne Road Barford	50	45	38-49	45	40	39-41
B: Sandy Way Barford	44	40	36-43	40*	35*	35*
C: Wasperton Farm (install)	47	43	34-54	45	35	19-53
D: Forge Cottage	70	55	55-56	63*	39*	39*
E: Holloway Farm	53	48	46-51	/	/	/
F: Wasperton Village	46	41	40-41	43	37	37
G: Seven Elms / Marl Pit Cottages	46	40	39-42	/	/	/

* One night time sample measurement taken
/ No night time measurement was taken

Daytime noise limits for the nearest residential receptors have been suggested below based on the average background sound levels measured around the site and the guidance in PPGM. A plan showing the receptor locations is provided in Appendix G.

Table 4.2 – Summary of daytime background sound levels and suggested daytime noise limits

Receptor Location	Baseline Survey Location	Average Daytime Background Sound Level dB $L_{A90,15min}$	Suggested Daytime Site Noise Limit dB $L_{Aeq,1h}$
1a: Wellesbourne Road, Barford	A: Wellesbourne Road Barford	45	55
1b: Bremridge Close, Barford	A: Wellesbourne Road Barford	45	55
2: Sandy Way, Barford	B: Sandy Way Barford	40	50
3: Wasperton Farm	C: Wasperton Farm	43	53
4a: Holloway Farm	E: Holloway Farm	48	55
4b: Forge Cottage	D: Forge Cottage	55	55
5: Wasperton Village	F: Wasperton Village	41	51
6: Marl Pit Cottages	G: Seven Elms / Marl Pit Cottages	40	50
7: Seven Elms	G: Seven Elms / Marl Pit Cottages	40	50
8: Glebe Farm	G: Seven Elms / Marl Pit Cottages	40	50

5 Noise Assessment

5.1 Noise Calculation Methodology

The Equivalent Continuous Noise Level, $L_{Aeq, T}$, is the preferred unit for assessing noise sources. It is the value of a continuous level that would have equivalent energy to the continuously varying noise over the specified period "T". This unit is recommended internationally for the description of environmental noise and is in general use. It is the chosen unit of BS 5228 for Construction and Open site noise; Planning Practice Guidance for Minerals and BS 7445 for the Description and Measurement of Environmental noise.

The noise levels likely to arise at the nearest dwellings will depend on various factors including the method of working, sound power levels of the plant working at the site, distance to the properties and the effects of the intervening ground and any screening in place (e.g. bunds). Allowance for these variables has been made in the calculations in order to calculate site noise levels at the nearest dwellings.

The calculations in this report are based on the methods contained in BS 5228-1: 2009 "Code of practice for noise and vibration control on construction and open sites – Part 1: Noise" + A1: 2014, Annex F. Further details of the calculation methods will be presented in a detailed report at a later stage.

For the purposes of examining a reasonable worst case, the various items at the site associated with minerals extraction have been assumed to operate at the closest practical position of the proposed quarry phase to each dwelling or, in some cases, at the second closest position where infilling would be the closest location. This presents the worst case situation where both extraction and infilling would be occurring in the closest phases of the site to the dwelling(s).

It has been assumed that the "fixed" plant items work 100% of each hour. Mobile plant has also been assumed to work 100% of each hour apart from tipping of infill which has been calculated to occur for 10% of the hour. On the access road, 16 HGV movements have been assumed during each hour period. Sound power levels used in the calculations are based on manufacturers' data or measurements made by WBM of similar plant items on other sites. 70% soft ground has been assumed between the nearest dwellings in Barford and Wasperton village and the site and 90% soft ground has been assumed between all other dwellings and the site.

Screening by earth bunds created on site has been included in the calculations except for site preparation (temporary operations). The screening includes a 5m high bund around the plant site area. All other bunds proposed around the site have been assumed to be 3m high. The bunds for all phases have been included in the calculations as marked on the plans shown in Appendix I.

5.2 Noise Sources and Sound Power Levels

The sand and gravel at the stie will be extracted by excavator, loaded directly into dump trucks and transported to the processing plant site. There it will be stockpiled and processed by the processing plant and loaded into road going HGVs for transport off site. Following the extraction of mineral in each phase, the void will be restored using infill material with the exception of a large central area which will be a silt lagoon.

Sound power levels used in the calculations are based on manufacturers' data or measurements made by WBM of similar plant items on other sites.

The plant items used in the calculations are listed in Table 5.1 below along with the sound power levels used in the calculations.

Table 5.1 – Summary of plant and sound power levels used in calculations

Operation		Plant Item	dB L_{WA}
Routine	Extraction	Excavator	105
		Dump Trucks	105
	Infilling	Tipping of infill from HGVs	107
		Grading of infill by Dozer	108
	Processing site	Processing Plant	110
		Loading Shovel (sound power for 2 shovels)	107
	Access / haul routes	HGVs movements on site	104
	Extraction / Infilling	Dewatering pump / generator (sound power assuming 4 pumps)	96
		Lagoon pump / generator (sound power assuming 2 pumps)	93
Temporary	Soil stripping / bund formation	Excavators (2) for soil/overburden stripping and bund formation (each)	107
		Dump Trucks for material transportation	105
		Dozer on soil store	108
Out of Hours	Extraction / Infilling	Dewatering pump / generator (sound power assuming 4 pumps)	96

To assess the noise levels for the proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall noise level. Set back distances from the proposed bunding to the nearest receptor locations have been explored and the highest calculated site noise levels are presented. An initial working depth of 0.5 metres has been assumed.

The activities that will take place as part of the routine operations on the site are:

- Extraction of sand and gravel using an excavator;
- Transportation of the extracted mineral to the processing plant site;
- Stockpiling and processing of the extracted mineral in the designated area;
- Transportation of processed mineral off site by road going HGVs;
- Infilling in the previously extracted phase (tipping of material) and grading with a small dozer;
- Restoration of the extraction area after completion of extraction and infilling.
- Use of dewatering pumps (due to high water table)

The activities that will take place as part of temporary operations on the site are:

- Excavators (two) stripping soil / undertaking bund formation and working in soil store;
- Transportation of material to / from working area
- Dozer working in soil store

The only sources that run into the evening and night time period are the dewatering pumps. Whilst these may not be operating continuously throughout the lifetime of the quarry, there will be some periods when they operate through the day and night (24/7).

5.3 Calculated Site Noise Levels

Routine Operations

The calculated noise levels for routine operations (including minerals extraction, processing, vehicle movements and infilling) are presented in Table 5.2 below and compared to the suggested daytime noise limits. The calculated site noise levels for routine operations comply with the suggested site noise limits based on current Government guidance for minerals operations.

Table 5.2: Calculated daytime noise levels for routine operations

Location	Calculated Site Noise Levels dB $L_{Aeq,1h}$	Suggested Daytime Site Noise Limit dB $L_{Aeq,1h}$
1a: Wellesbourne Road, Barford	43	55
1b: Bremridge Close, Barford	43	55
2: Sandy Way, Barford	45	50
3: Wasperton Farm	51	53
4a: Holloway Farm	55	55
4b: Forge Cottage	50	55
5: Wasperton Village	50	51
6: Marl Pit Cottages	48	50
7: Seven Elms	48	50
8: Glebe Farm	48	50

Temporary Operations

The calculated noise levels for temporary operations, for example site preparation, overburden removal and bund formation, have been presented in Table 5.3 below. In these calculations no additional screening by earth mounds has been included and it is assumed that plant and machinery are working in the phase closest to the nearest dwelling.

Table 5.3: Calculated daytime noise levels for temporary operations

Location	Calculated Site Noise Levels dB $L_{Aeq,1h}$	Suggested Daytime Site Noise Limit dB $L_{Aeq,1h}$
1a: Wellesbourne Road, Barford	44	70
1b: Bremridge Close, Barford	45	70
2: Sandy Way, Barford	47	70
3: Wasperton Farm	61	70
4a: Holloway Farm	63	70
4b: Forge Cottage	53	70
5: Wasperton Village	51	70
6: Marl Pit Cottages	48	70
7: Seven Elms	51	70
8: Glebe Farm	66	70

The calculated site noise levels for temporary operations comply with the suggested site noise limits based on current Government guidance for minerals extraction where increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq,1h\ (free\ field)}$ are permitted for up to 8 weeks in a year for essential site preparation and restoration work.

Out of Hours Operations

The only sources that run into the evening and night time period are the dewatering pumps. Whilst these may not be operating continuously throughout the lifetime of the quarry, there will be some periods when they operate through the day and night (24/7).

Calculated noise levels from the dewatering pumps at the nearest residential dwellings are presented in Table 5.4 below. Table 5.4 also gives the measured average night time background noise levels, the background noise level range and the maximum night time noise limit according to Government minerals planning guidance. At Holloway Farm, Marl Pit Cottages, Seven Elms and Glebe Farm, where night time background noise levels were not measured, the baseline data for Wasperton Farm has been used as a representative proxy location.

Location	**Calculated Site Noise Levels dB $L_{Aeq,1h}$**	**Average Background Sound Level dB $L_{A90,15min}$**	**Range Background Sound Level dB $L_{A90,15min}$**	**Maximum Permitted Night-time Noise Limit dB $L_{Aeq,1h}$**
1a: Wellesbourne Road, Barford	26	40	39-41	42
1b: Bremridge Close, Barford	27	40	39-41	42
2: Sandy Way, Barford	28	35	35	42
3: Wasperton Farm	35	35	19-53*	42
4a: Holloway Farm	36	39	39	42
4b: Forge Cottage	33	39	39	42
5: Wasperton Village	33	37	37	42
6: Marl Pit Cottages	31	35	19-53*	42
7: Seven Elms	33	35	19-53*	42
8: Glebe Farm	35	35	19-53*	42

* Based on data from installed sound level meter

At all locations predicted out of hours operations are calculated to be equal to or below average night time background noise levels and a good margin below the maximum permitted night time noise limit set in minerals planning guidance. However, the range of measured night time background noise levels indicates that there are periods when background noise levels can fall much lower than indicated by the average.

A modal analysis of the background noise levels at Wasperton Farm (where the meter was installed) indicates two modal points at 38dB $L_{A90,15min}$ and 25dB $L_{A90,15min}$. Based on this lower modal value, noise impact from the dewatering pumps could result in adverse impact arising and the potential for community complaints.

It is recommended that additional mitigation measures are implemented for the use of dewatering pumps at night time. This is discussed along with residual impacts below.

6 Mitigation and Residual Impacts

It is the intention of the operator to minimise the noise impact at residential receptors using the mitigation measures described in this report, using appropriate modern maintained plant and equipment and by demonstrating compliance with guidance and any approved noise limits for the site.

The calculated overall “reasonable worst case” site noise levels for routine and temporary operations are calculated to be at or below the suggested site noise limits at all dwellings considered.

Noise from mineral workings can impact on people living and working in the vicinity of such sites. At a distance, noise from machinery used at mineral workings does not usually contain a distinguishable tone nor does it tend to be impulsive. The operations are usually limited to daytime activities and do not interfere with sleep processes but can be intrusive or annoying if unmitigated during the day. Whilst there is some potential for night time impact when dewatering pumps are used, the pumps will not be operating continuously throughout the lifetime of the quarry and this should be considered with the context of the impact assessment.

General site noise is proposed to be mitigated by use of earth bunds around working areas of the site up to a height of 3-5m. The following additional measures are recommended for mitigation of dewatering pump noise at night time:

- Dewatering pumps should be run off mains power at night time, i.e. no generators to be run between 23:00 and 07:00; OR

- Where generators need to run at night time, these should be acoustically screened or enclosed such that the overall reduction from the screening or enclosure provides a minimum of 12dB(A) attenuation.

7 Summary and Conclusions

WBM has been appointed by Landesign Planning & Landscape Ltd on behalf of Smiths Concrete Ltd to provide a noise impact assessment for a new sand and gravel quarry at Wasperton Farm, Wasperton.

A noise survey was undertaken in September 2021 to establish existing baseline noise levels in the area, from which suggested noise limits for the quarry have been determined.

With 3-5m high bunding in place around working areas of the site during routine operations, the calculated site noise levels for both temporary and routine operations comply with the suggested site noise limits based on current Government guidance for minerals extraction.

Out of hours operations indicate that noise from the generators associated with the dewatering pumps could result in an adverse impact at the nearest dwellings to the site if left unmitigated. Whilst calculated site noise levels are equal to or below average background noise levels, the survey results indicate that there are periods when background noise levels fall much lower than indicated by the average. Additional mitigation by way of screening / enclosure is recommended to reduce noise during out of hours operations or, if practical, dewatering pumps should be run off mains power.

As the proposed operations conform to the advice set out in the Planning Practice Guidance with regard to both routine and temporary operations, it is considered that the site can be worked while keeping noise emissions to within environmentally acceptable limits.

Sarah Large MA (Cantab) MSc Dip (IoA) MIOA
Senior Consultant

(This document has been generated electronically and therefore bears no signature)

Appendix A – Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave of third octave band.

Appendix A (continued)

Day Evening Night Level L_{den}

The day evening night level is the average A-weighted sound level over a 24 hour period, determined from the L_{day} ($L_{Aeq,12hr}$ 7am-7pm), $L_{evening}$ ($L_{Aeq,4hr}$ 7pm-11pm) and L_{night} ($L_{Aeq,8hr}$ 11pm-7am), with a 5 dB penalty added to the $L_{evening}$ and a 10 dB penalty added to the L_{night}.

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,}$ is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Noise Rating NR

The noise rating level is a single figure index obtained from an octave band analysis of a noise. The NR level is obtained by comparing the octave band sound pressure levels to a set of reference curves and the highest NR curve that is intersected by the sound pressure levels gives the NR level.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B – Guidance Documents

Summaries of guidance documents are set out in this Appendix.

The documents include:

Noise Policy Statement for England (NPSE) 2010

National Planning Policy Framework (NPPF) 2021

Planning Practice Guidance Noise (PPGN)

Planning Practice Guidance Minerals (PPGM)

Appendix B (continued)

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010. The aim of the document is to "…*provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion*".

The long term vision of noise policy is to *"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

The long term vision is supported by three aims:

"*Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life*."

The Explanatory Note to the NPSE introduces the concepts of observed effect levels with regard to noise.

NOEL (No Observed Effect Level) - this is the level below which no effect can be detected, i.e. below this level there is no detectable effect on health and quality of life due to the noise.

LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected due to noise.

SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur due to noise.

With regard to the first aim of the NPSE, any noise impacts that are above SOAEL should be avoided.

Where the impact lies somewhere between LOAEL and SOAEL, the second aim of the NPSE requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life. However, as stated in paragraph 2.24 of the Explanatory Note to the NPSE "*This does not mean that such adverse effects cannot occur*".

Appendix B (continued)

National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England. The latest version was published in July 2021.

At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development.

Section 15 of the NPPF (Conserving and enhancing the natural environment) refers specifically to noise in the following paragraphs:

"*174. Planning policies and decisions should contribute to and enhance the natural and local environment by…*

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability…"

"*185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason…"

Paragraph 185(a) also refers to the Explanatory Note to NPSE, 2010

Appendix B (continued)

Mineral sites are considered in Section 17 (Facilitating the sustainable use of minerals) of the NPPF.

"*210. Planning policies should …*

(e) safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;

f) set out criteria or requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;

(g) when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction..."

"*211. When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should…*

(c) ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties…"

The term "*sites for: the bulk transport, handling and processing of minerals*" is a general term which WBM considers to include rail heads, rail links to quarries and related sites, wharfage and associated storage.

Paragraph 211(c) advises that the national planning guidance on minerals sets out how these policies should be implemented.

Appendix B (continued)

Planning Practice Guidance Noise

Technical guidance on noise is provided by Planning Practice Guidance, published by the Ministry of Housing, Communities & Local Government. Planning Practice Guidance Noise (PPGN) was published in March 2014 and most recently updated in July 2019. This document provides advice on how planning can manage potential noise impacts in new development. It makes reference to the Explanatory Note of the NPSE and also the NPPF.

Paragraph 005 Reference ID: 30-005-20190722 of the PPGN provides guidance on how to establish if noise is likely to be a concern, including the noise exposure hierarchy and examples of outcomes, summarised overleaf. These can be referred to in the consideration of the effects of impacts.

Appendix B (continued)

PPGN Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Appendix B (continued)

Planning Practice Guidance Minerals

Paragraphs 19 to 22 inclusive of the "Minerals" chapter of the Planning Practice Guidance (PPGM), dated March 2014, are under the heading "Noise emissions" within the section "Assessing environmental impacts from mineral extraction". These paragraphs are reproduced below.

Paragraph 019 Reference ID: 27-019-20140306 states:

"***How should minerals operators seek to control noise emissions?***

Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.

Proposals for the control or mitigation of noise emissions should:

- *consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*
- *assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*
- *estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*
- *identify proposals to minimise, mitigate or remove noise emissions at source;*
- *monitor the resulting noise to check compliance with any proposed or imposed conditions*."

Paragraph 020 Reference ID: 27-020-20140306 states:

"***How should mineral planning authorities determine the impact of noise?***

Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy."

Appendix B (continued)

Paragraph 021 Reference ID: 27-021-20140306 states:

"***What are the appropriate noise standards for mineral operators for normal operations?***

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field).

For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,1h (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise (e.g. Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed."

Paragraph 022 Reference ID: 27-022-20140306 states:

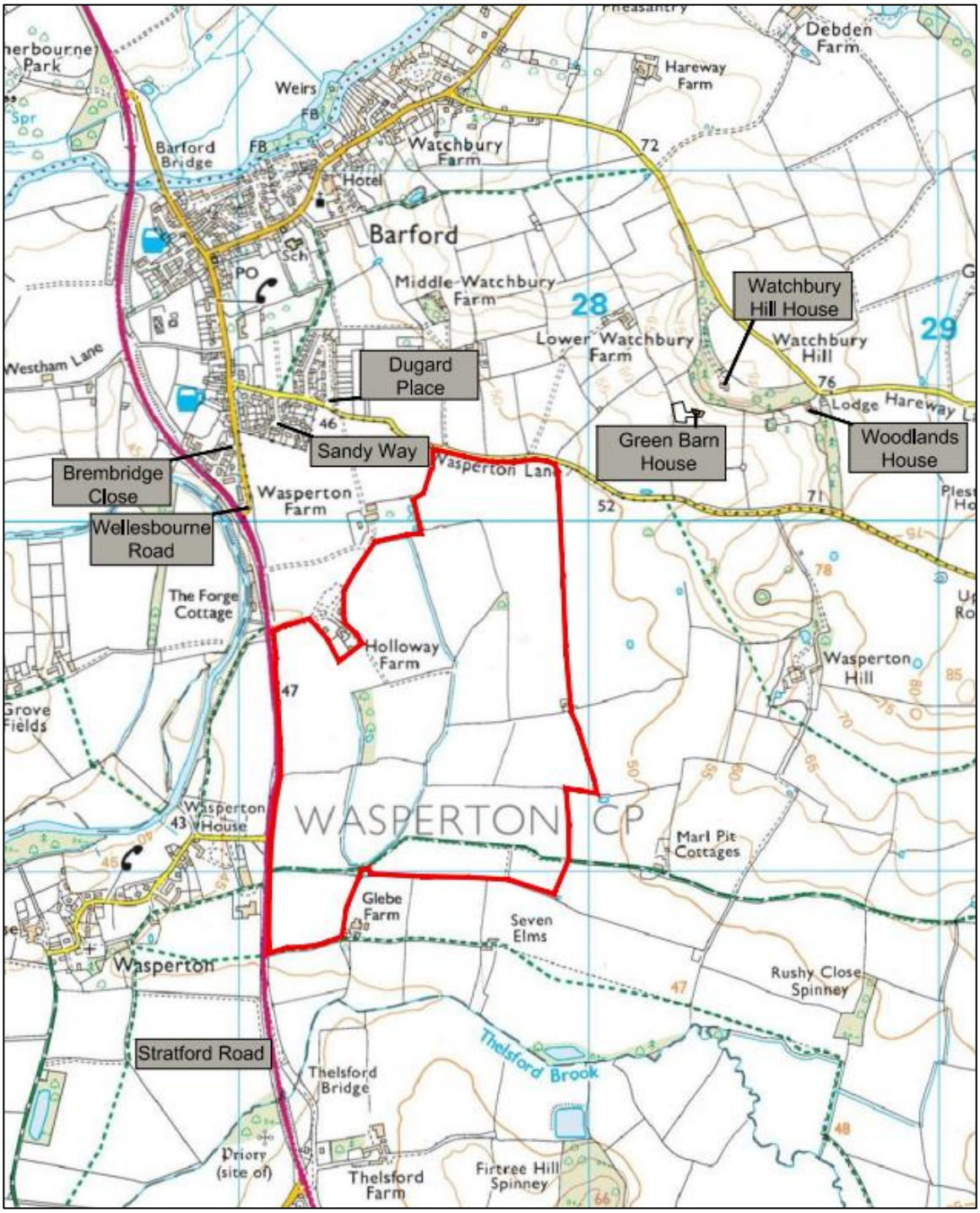
"***What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?***

Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum."

Appendix C – Site plan



Appendix D – Survey Details

Date and Locations of Survey

Install:

17th September 2021 10:15 – 21st September 2021 12:45

Sample measurements:

17th September 2021 10:00 – 14:16

21st September 2021 00:53 – 02:51

21st September 2021 09:05 – 12:35

Noise measurements locations as follows:

Appendix D (continued)

Locations	Name	Description
A	Wellesbourne Road, Barford	At the road side opposite dwellings 37-41 Wellesbourne Road, Barford.
B	Sandy Way, Barford	To the south of dwellings along Sandy Way, within garaged area to the rear of 16-17 Sandy Way, Barford.
C	Wasperton Farm	West of the dwelling in main garden area.
D	Forge Cottage	At entrance to Holloway Farm, adjacent to A429.
E	Holloway Farm	Along access road to Holloway Farm, approximately 125m west of A429.
F	Wasperton Village	In layby at corner of main street, by gate to footpath and opposite Wasperton House.
G	Glebe Farm / Seven Elms / Marl Pit Cottages	Along access road to Marl Pit Cottages, approximately 700m west of A429.

Survey carried out by

Sarah Large

Weather Conditions

17th September 2021 10:15 – 21st September 2021 12:45

Generally dry and warm with low wind speeds (less than 5m/s). Variable wind directions beginning southerly and turning northerly towards the end of the survey.

17th September 2021 10:00 – 14:16

Dry, sunny / cloudy and warm. Breezy (3-4m/s) and southerly wind. 18-19°C.

21st September 2021 00:53 – 02:51

Clear sky, still with no wind (northerly direction). Cool 10°C.

21st September 2021 09:05 – 12:35

Mostly clear sky, sunny and warm 15°C. Westerly wind direction but no breeze, still.

Appendix D (continued)

Instrumentation and Calibration

The instrumentation used (including serial number in brackets) is tabulated below along with information on how the equipment was used.

Instrumentation	Survey information
Norsonic 140 Sound Level Meter (1403138)	17th September 2021 10:00 – 14:16 21st September 2021 00:53 – 02:51 21st September 2021 09:05 – 12:35
Norsonic 1251 Calibrator (31991)	
Rion NL-52 Sound Level Meter (420715)	17th September 2021 10:15 – 21st September 2021 12:45
Rion NC-74 Calibrator (34425556)	

The sensitivity of each meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Instrumentation	Survey Date	Start Cal	End Cal
Rion NL-52 Sound Level Meter (420715) Rion NC-74 Calibrator (34425556)	17th September 2021 10:15 – 21st September 2021 12:45	94.0 dB(A)	94.0 dB(A)
Norsonic 140 Sound Level Meter (1403138) Norsonic 1251 Calibrator (31991)	17th September 2021 10:00 – 14:16	113.6 dB(A)	113.5 dB(A)
	21st September 2021 00:53 – 02:51	113.6 dB(A)	113.6 dB(A)
	21st September 2021 09:05 – 12:35	113.6 dB(A)	113.7 dB(A)

The meters and calibrators are tested monthly against Norsonic Calibrators, type 1253 (serial number 22906) and type 1256 (serial number 125626100) both with UKAS approved laboratory certificates of calibration. In addition, the meters and calibrators undergo traceable calibration at an external laboratory every two years.

Appendix D (continued)

Survey Details

A meter was installed at Wasperton Farm (Location C) and left recording contiguous 15 minute sample measurements. Attended sample measures of 15 minute duration were also taken at the locations identified on the plan above. Both the install and sample measurements were taken with a microphone height of between 1.2 and 1.5 metres above local ground level, with windshields used throughout. All measurement locations were free field.

Observations

During the first site visit on 17th September 2021 the main sources of noise in the area were from local and distant road traffic with some distant agricultural machinery noise audible at Locations A and B. At night time (20th – 21st September 2021) there was reduced local road traffic though distant road traffic remained the predominant source of noise in the area. At location B noise from a water feature was also audible at night time. On the final visit during daytime of 21st September 2021 the main source of noise was again local and distant road traffic noise, though some intermittent aircraft noise was also noted. Birdsong and wildlife noise was noted but was not dominant over that from transportation sources.

Appendix E– Survey Results – Sample Measurements

17th September 2021 10:00 – 14:16 (Daytime)

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
Loc C	10:00	51	70	53	45	Distant road traffic noise
Loc C	10:16	53	81	54	47	Distant road traffic noise
Loc D	10:44	67	81	71	56	Close to road, mainly road traffic noise. Some light aircraft and distant agricultural noise.
Loc F	11:02	46	64	48	41	Distant road traffic noise, wind in trees, birds, some local road traffic noise.
Loc G	11:23	48	66	49	42	Mostly distant road traffic noise, some aircraft noise
Loc A	11:47	50	58	53	46	Local and distant road traffic noise, distant agricultural noise, intermittent aircraft.
Loc B	12:05	44	59	47	39	Similar to Loc 1 but more sheltered. Mostly road traffic noise and distant agricultural machinery. Just audible noise from nearby water feature.
Loc E	12:29	55	66	57	51	Road traffic noise still dominant
Loc F	12:50	46	67	48	41	Road traffic noise. Some intermittent power tools audible.
Loc G	13:11	47	79	47	41	Road traffic noise. Bit breezier now too.
Loc A	13:38	53	62	56	49	Road traffic noise.
Loc B	13:56	48	59	50	43	Road traffic noise.

21st September 2021 00:53 – 02:51 (Night time)

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
Loc F	00:53	42	68	44	37	Distant road traffic noise, some local road traffic but much reduced. Some distant aircraft.
Loc B	01:15	40	55	42	35	Distant road traffic noise, water feature, some local road traffic.
Loc A	01:35	43	63	45	39	Distant road traffic noise, local roads very quiet.
Loc F	01:55	43	74	45	37	Distant road traffic noise.
Loc D	02:15	63	87	55	39	Distant road traffic noise.
Loc A	02:34	46	64	48	41	Distant road traffic noise.

Appendix E (continued)

21st September 2021 09:05 – 12:35 (Daytime)

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
Loc A	09:05	51	65	53	46	Distant and local road traffic noise. Overhead aircraft, some agricultural noise, generally quieter than previous visit.
Loc B	09:22	46	63	48	41	Distant road traffic noise, more sheltered than Loc 1, water feature noise.
Loc D	09:44	73	84	77	55	Road traffic noise.
Loc G	10:06	46	72	48	40	Distant road traffic noise, aircraft, birdsong.
Loc F	10:27	47	77	48	40	Some vehicle noise but reduces after 5mins. Distant road traffic noise, aircraft.
Loc A	10:51	45	66	49	38	Road traffic noise and aircraft.
Loc B	11:10	39	58	41	36	Road traffic noise, aircraft, water feature.
Loc E	11:31	52	72	54	46	Road traffic noise and aircraft.
Loc G	11:53	44	74	45	39	Distant road traffic noise, aircraft, birdsong.
Loc F	12:16	44	66	45	40	Road traffic noise, aircraft, some distant machinery but intermittent.

Appendix F – Survey Results - Install

17th September 2021 10:15 – 21st September 2021 12:45 (Location C)

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
17/09/2021 10:15	53	72	54	48
17/09/2021 10:30	53	78	55	46
17/09/2021 10:45	52	65	54	46
17/09/2021 11:00	51	63	54	47
17/09/2021 11:15	51	63	54	47
17/09/2021 11:30	52	66	55	47
17/09/2021 11:45	53	69	53	48
17/09/2021 12:00	50	62	52	47
17/09/2021 12:15	50	68	50	45
17/09/2021 12:30	50	61	52	47
17/09/2021 12:45	52	60	54	48
17/09/2021 13:00	51	59	54	47
17/09/2021 13:15	51	61	53	48
17/09/2021 13:30	52	60	54	49
17/09/2021 13:45	52	59	54	49
17/09/2021 14:00	52	58	54	49
17/09/2021 14:15	52	60	55	49
17/09/2021 14:30	52	61	54	49
17/09/2021 14:45	51	63	53	47
17/09/2021 15:00	52	63	54	49
17/09/2021 15:15	52	59	54	48
17/09/2021 15:30	52	59	54	47
17/09/2021 15:45	53	66	55	48
17/09/2021 16:00	51	57	53	48
17/09/2021 16:15	52	66	54	47
17/09/2021 16:30	53	73	54	48
17/09/2021 16:45	51	57	53	48
17/09/2021 17:00	51	62	54	48
17/09/2021 17:15	51	58	53	48
17/09/2021 17:30	52	60	54	49
17/09/2021 17:45	49	58	52	46

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
17/09/2021 18:00	50	61	53	45
17/09/2021 18:15	49	57	52	45
17/09/2021 18:30	50	61	53	45
17/09/2021 18:45	48	62	51	44
17/09/2021 19:00	47	55	49	43
17/09/2021 19:15	48	55	50	44
17/09/2021 19:30	46	57	49	42
17/09/2021 19:45	46	56	48	41
17/09/2021 20:00	46	55	49	40
17/09/2021 20:15	45	53	48	40
17/09/2021 20:30	45	57	48	37
17/09/2021 20:45	45	54	48	41
17/09/2021 21:00	47	61	50	41
17/09/2021 21:15	47	60	51	38
17/09/2021 21:30	45	62	49	34
17/09/2021 21:45	46	59	49	37
17/09/2021 22:00	47	60	51	39
17/09/2021 22:15	45	57	48	38
17/09/2021 22:30	44	54	48	35
17/09/2021 22:45	46	58	50	39
17/09/2021 23:00	43	68	47	34
17/09/2021 23:15	43	56	47	34
17/09/2021 23:30	45	58	48	35
17/09/2021 23:45	45	59	50	31
18/09/2021 00:00	44	57	48	31
18/09/2021 00:15	41	58	45	26
18/09/2021 00:30	43	55	47	30
18/09/2021 00:45	41	54	45	26
18/09/2021 01:00	41	52	46	24
18/09/2021 01:15	40	54	46	24
18/09/2021 01:30	39	52	44	26
18/09/2021 01:45	43	55	47	29
18/09/2021 02:00	40	55	44	24
18/09/2021 02:15	42	56	47	24

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
18/09/2021 02:30	39	54	44	23
18/09/2021 02:45	42	56	47	21
18/09/2021 03:00	41	55	46	19
18/09/2021 03:15	41	58	45	22
18/09/2021 03:30	40	53	46	23
18/09/2021 03:45	43	56	48	25
18/09/2021 04:00	40	58	43	21
18/09/2021 04:15	50	69	50	25
18/09/2021 04:30	45	64	48	23
18/09/2021 04:45	43	56	47	25
18/09/2021 05:00	48	68	48	35
18/09/2021 05:15	44	55	48	33
18/09/2021 05:30	51	70	51	33
18/09/2021 05:45	54	71	53	33
18/09/2021 06:00	52	71	53	39
18/09/2021 06:15	55	74	55	41
18/09/2021 06:30	54	73	51	38
18/09/2021 06:45	45	67	46	38
18/09/2021 07:00	46	67	43	35
18/09/2021 07:15	48	67	49	34
18/09/2021 07:30	49	69	53	37
18/09/2021 07:45	47	72	46	35
18/09/2021 08:00	37	46	39	34
18/09/2021 08:15	43	66	44	35
18/09/2021 08:30	48	65	52	39
18/09/2021 08:45	48	70	47	41
18/09/2021 09:00	43	56	44	39
18/09/2021 09:15	47	62	48	40
18/09/2021 09:30	46	67	44	40
18/09/2021 09:45	41	55	42	38
18/09/2021 10:00	42	59	43	37
18/09/2021 10:15	39	54	41	37
18/09/2021 10:30	43	65	42	37
18/09/2021 10:45	41	54	43	38

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
18/09/2021 11:00	44	67	41	38
18/09/2021 11:15	40	51	43	38
18/09/2021 11:30	42	62	42	37
18/09/2021 11:45	43	56	46	36
18/09/2021 12:00	46	55	48	42
18/09/2021 12:15	44	53	47	40
18/09/2021 12:30	45	59	47	40
18/09/2021 12:45	52	72	52	44
18/09/2021 13:00	49	68	51	45
18/09/2021 13:15	49	65	51	44
18/09/2021 13:30	45	52	47	41
18/09/2021 13:45	47	69	45	38
18/09/2021 14:00	43	52	47	38
18/09/2021 14:15	50	70	51	43
18/09/2021 14:30	47	60	50	43
18/09/2021 14:45	48	64	49	45
18/09/2021 15:00	47	61	48	41
18/09/2021 15:15	47	67	46	40
18/09/2021 15:30	47	64	49	41
18/09/2021 15:45	49	62	53	42
18/09/2021 16:00	46	60	48	41
18/09/2021 16:15	53	77	49	43
18/09/2021 16:30	48	73	49	41
18/09/2021 16:45	49	74	46	42
18/09/2021 17:00	47	63	49	40
18/09/2021 17:15	43	58	45	41
18/09/2021 17:30	46	61	46	42
18/09/2021 17:45	43	56	45	40
18/09/2021 18:00	44	53	46	41
18/09/2021 18:15	47	62	48	42
18/09/2021 18:30	46	53	49	43
18/09/2021 18:45	49	63	53	44
18/09/2021 19:00	49	58	51	45
18/09/2021 19:15	50	61	53	44

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
18/09/2021 19:30	47	57	51	41
18/09/2021 19:45	44	53	48	40
18/09/2021 20:00	45	58	48	40
18/09/2021 20:15	47	70	50	41
18/09/2021 20:30	47	54	50	42
18/09/2021 20:45	45	53	48	39
18/09/2021 21:00	46	60	49	41
18/09/2021 21:15	47	57	50	42
18/09/2021 21:30	47	58	50	40
18/09/2021 21:45	48	61	52	38
18/09/2021 22:00	47	57	51	34
18/09/2021 22:15	47	55	51	38
18/09/2021 22:30	44	55	48	36
18/09/2021 22:45	45	55	48	38
18/09/2021 23:00	45	56	49	36
18/09/2021 23:15	46	58	50	34
18/09/2021 23:30	44	56	48	28
18/09/2021 23:45	48	65	49	34
19/09/2021 00:00	45	64	47	25
19/09/2021 00:15	43	56	47	29
19/09/2021 00:30	40	53	45	25
19/09/2021 00:45	40	54	44	27
19/09/2021 01:00	39	56	43	24
19/09/2021 01:15	41	61	45	23
19/09/2021 01:30	40	55	45	24
19/09/2021 01:45	42	56	46	25
19/09/2021 02:00	38	51	43	24
19/09/2021 02:15	38	54	41	21
19/09/2021 02:30	35	52	38	21
19/09/2021 02:45	35	52	38	21
19/09/2021 03:00	41	57	44	21
19/09/2021 03:15	39	56	43	22
19/09/2021 03:30	39	53	44	22
19/09/2021 03:45	39	52	44	25

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
19/09/2021 04:00	39	63	42	22
19/09/2021 04:15	39	54	43	27
19/09/2021 04:30	48	71	44	22
19/09/2021 04:45	38	54	42	25
19/09/2021 05:00	44	69	46	25
19/09/2021 05:15	53	72	50	30
19/09/2021 05:30	50	72	46	30
19/09/2021 05:45	53	73	42	34
19/09/2021 06:00	54	74	44	36
19/09/2021 06:15	52	75	45	39
19/09/2021 06:30	49	68	47	40
19/09/2021 06:45	51	73	47	40
19/09/2021 07:00	48	69	50	41
19/09/2021 07:15	46	57	48	42
19/09/2021 07:30	46	59	48	42
19/09/2021 07:45	45	58	47	40
19/09/2021 08:00	42	50	44	41
19/09/2021 08:15	44	59	47	42
19/09/2021 08:30	49	71	49	43
19/09/2021 08:45	44	54	48	39
19/09/2021 09:00	42	49	43	39
19/09/2021 09:15	48	69	47	42
19/09/2021 09:30	46	58	48	43
19/09/2021 09:45	44	56	46	42
19/09/2021 10:00	47	69	46	40
19/09/2021 10:15	41	52	43	38
19/09/2021 10:30	41	58	43	38
19/09/2021 10:45	41	59	43	37
19/09/2021 11:00	45	65	44	39
19/09/2021 11:15	41	55	43	38
19/09/2021 11:30	41	54	43	39
19/09/2021 11:45	45	66	45	38
19/09/2021 12:00	44	51	47	41
19/09/2021 12:15	44	56	47	41

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
19/09/2021 12:30	42	55	44	39
19/09/2021 12:45	45	65	47	39
19/09/2021 13:00	46	69	47	40
19/09/2021 13:15	48	73	46	41
19/09/2021 13:30	43	57	45	40
19/09/2021 13:45	44	53	47	41
19/09/2021 14:00	54	74	52	44
19/09/2021 14:15	47	61	49	44
19/09/2021 14:30	49	66	50	44
19/09/2021 14:45	48	66	50	43
19/09/2021 15:00	48	67	49	42
19/09/2021 15:15	50	75	51	44
19/09/2021 15:30	47	59	50	44
19/09/2021 15:45	49	67	49	43
19/09/2021 16:00	46	66	47	42
19/09/2021 16:15	51	73	48	44
19/09/2021 16:30	50	69	51	47
19/09/2021 16:45	51	69	52	48
19/09/2021 17:00	50	70	52	48
19/09/2021 17:15	51	61	53	48
19/09/2021 17:30	49	64	51	46
19/09/2021 17:45	54	70	51	46
19/09/2021 18:00	48	57	50	46
19/09/2021 18:15	49	66	51	45
19/09/2021 18:30	48	59	50	45
19/09/2021 18:45	48	61	50	45
19/09/2021 19:00	47	54	48	45
19/09/2021 19:15	46	53	48	44
19/09/2021 19:30	46	61	48	43
19/09/2021 19:45	44	51	46	43
19/09/2021 20:00	44	51	46	42
19/09/2021 20:15	45	55	47	43
19/09/2021 20:30	45	54	47	43
19/09/2021 20:45	45	53	47	43

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
19/09/2021 21:00	44	52	46	42
19/09/2021 21:15	43	53	45	41
19/09/2021 21:30	44	57	45	41
19/09/2021 21:45	43	52	45	40
19/09/2021 22:00	43	58	45	41
19/09/2021 22:15	42	51	45	39
19/09/2021 22:30	42	52	44	39
19/09/2021 22:45	42	54	44	39
19/09/2021 23:00	40	52	43	37
19/09/2021 23:15	42	55	45	38
19/09/2021 23:30	42	52	44	39
19/09/2021 23:45	41	49	43	39
20/09/2021 00:00	41	50	43	39
20/09/2021 00:15	41	52	44	38
20/09/2021 00:30	41	52	43	38
20/09/2021 00:45	40	52	42	38
20/09/2021 01:00	40	50	42	38
20/09/2021 01:15	40	55	42	38
20/09/2021 01:30	40	52	42	37
20/09/2021 01:45	41	53	42	37
20/09/2021 02:00	40	54	42	37
20/09/2021 02:15	41	51	42	38
20/09/2021 02:30	41	52	43	37
20/09/2021 02:45	42	55	43	39
20/09/2021 03:00	42	54	44	38
20/09/2021 03:15	44	56	47	38
20/09/2021 03:30	45	61	46	40
20/09/2021 03:45	45	55	46	42
20/09/2021 04:00	47	64	50	43
20/09/2021 04:15	47	62	49	43
20/09/2021 04:30	52	71	48	44
20/09/2021 04:45	48	57	51	44
20/09/2021 05:00	50	67	52	48
20/09/2021 05:15	54	70	54	49

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
20/09/2021 05:30	54	70	55	49
20/09/2021 05:45	55	73	57	50
20/09/2021 06:00	58	75	59	51
20/09/2021 06:15	58	76	59	51
20/09/2021 06:30	55	69	56	53
20/09/2021 06:45	56	69	57	53
20/09/2021 07:00	56	68	57	54
20/09/2021 07:15	56	67	57	54
20/09/2021 07:30	57	70	58	54
20/09/2021 07:45	55	58	56	53
20/09/2021 08:00	53	57	54	53
20/09/2021 08:15	53	70	53	52
20/09/2021 08:30	51	67	52	50
20/09/2021 08:45	49	66	50	47
20/09/2021 09:00	47	54	48	45
20/09/2021 09:15	48	68	47	44
20/09/2021 09:30	45	62	47	43
20/09/2021 09:45	45	60	47	42
20/09/2021 10:00	44	59	45	42
20/09/2021 10:15	43	52	45	42
20/09/2021 10:30	45	66	45	41
20/09/2021 10:45	44	66	45	42
20/09/2021 11:00	43	54	45	41
20/09/2021 11:15	45	58	47	42
20/09/2021 11:30	44	52	46	42
20/09/2021 11:45	44	55	46	42
20/09/2021 12:00	46	58	48	43
20/09/2021 12:15	47	71	46	43
20/09/2021 12:30	48	70	47	43
20/09/2021 12:45	47	69	47	41
20/09/2021 13:00	43	56	45	41
20/09/2021 13:15	42	54	44	41
20/09/2021 13:30	44	65	45	41
20/09/2021 13:45	46	66	46	41

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
20/09/2021 14:00	53	72	51	41
20/09/2021 14:15	45	66	46	40
20/09/2021 14:30	44	55	46	41
20/09/2021 14:45	44	56	47	41
20/09/2021 15:00	46	68	47	41
20/09/2021 15:15	43	58	45	41
20/09/2021 15:30	43	55	44	41
20/09/2021 15:45	46	64	46	42
20/09/2021 16:00	43	57	45	41
20/09/2021 16:15	44	56	46	42
20/09/2021 16:30	46	65	46	42
20/09/2021 16:45	48	68	48	43
20/09/2021 17:00	46	53	47	44
20/09/2021 17:15	47	55	48	45
20/09/2021 17:30	50	66	51	44
20/09/2021 17:45	46	57	48	44
20/09/2021 18:00	46	56	48	44
20/09/2021 18:15	46	52	47	44
20/09/2021 18:30	46	54	47	44
20/09/2021 18:45	48	59	50	46
20/09/2021 19:00	49	59	52	46
20/09/2021 19:15	49	56	51	45
20/09/2021 19:30	49	57	52	45
20/09/2021 19:45	48	57	51	44
20/09/2021 20:00	49	56	52	44
20/09/2021 20:15	49	55	51	46
20/09/2021 20:30	49	57	51	46
20/09/2021 20:45	48	55	50	46
20/09/2021 21:00	49	56	51	46
20/09/2021 21:15	47	52	48	45
20/09/2021 21:30	47	53	49	44
20/09/2021 21:45	48	57	51	44
20/09/2021 22:00	50	59	53	45
20/09/2021 22:15	48	66	50	43

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
20/09/2021 22:30	45	54	47	42
20/09/2021 22:45	44	52	46	42
20/09/2021 23:00	45	51	47	43
20/09/2021 23:15	46	55	49	43
20/09/2021 23:30	48	60	51	44
20/09/2021 23:45	45	55	48	42
21/09/2021 00:00	47	56	50	43
21/09/2021 00:15	47	63	50	41
21/09/2021 00:30	47	61	49	43
21/09/2021 00:45	43	54	45	41
21/09/2021 01:00	45	56	47	40
21/09/2021 01:15	43	57	46	39
21/09/2021 01:30	43	55	45	40
21/09/2021 01:45	46	58	49	43
21/09/2021 02:00	47	60	49	43
21/09/2021 02:15	46	58	48	42
21/09/2021 02:30	45	60	48	41
21/09/2021 02:45	45	58	48	41
21/09/2021 03:00	48	59	50	44
21/09/2021 03:15	46	54	48	42
21/09/2021 03:30	47	62	50	43
21/09/2021 03:45	47	60	49	42
21/09/2021 04:00	45	57	48	41
21/09/2021 04:15	48	61	52	42
21/09/2021 04:30	46	56	50	43
21/09/2021 04:45	52	71	49	43
21/09/2021 05:00	47	57	50	44
21/09/2021 05:15	53	72	51	46
21/09/2021 05:30	52	72	52	46
21/09/2021 05:45	53	72	52	47
21/09/2021 06:00	57	76	54	48
21/09/2021 06:15	56	75	52	48
21/09/2021 06:30	51	70	52	49
21/09/2021 06:45	53	74	54	50

Date / Start Time	Results dB (T = 15 minutes)			
	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$	$L_{Aeq,T}$
21/09/2021 07:00	53	67	54	50
21/09/2021 07:15	50	55	52	48
21/09/2021 07:30	50	62	51	48
21/09/2021 07:45	50	65	51	49
21/09/2021 08:00	50	60	51	49
21/09/2021 08:15	50	60	52	49
21/09/2021 08:30	52	70	52	49
21/09/2021 08:45	49	60	51	47
21/09/2021 09:00	52	71	51	47
21/09/2021 09:15	49	56	51	46
21/09/2021 09:30	49	64	51	47
21/09/2021 09:45	48	67	49	45
21/09/2021 10:00	46	62	49	41
21/09/2021 10:15	44	61	46	40
21/09/2021 10:30	43	54	45	40
21/09/2021 10:45	45	60	48	40
21/09/2021 11:00	45	58	47	41
21/09/2021 11:15	43	51	46	41
21/09/2021 11:30	48	68	47	41
21/09/2021 11:45	42	52	43	40
21/09/2021 12:00	44	55	47	40
21/09/2021 12:15	43	57	44	40
21/09/2021 12:30	46	70	46	40
21/09/2021 12:45	44	51	46	42

Appendix G – Plan of Assessment Locations

Appendix H – Noise Calculation Method and Calculation Sheets

Specific noise levels are predicted or measured in terms of the Equivalent Continuous Noise Level, $L_{Aeq,T}$ over a given reference time interval, T. In the Planning Practice Guidance for Minerals the time interval for daytime, evening and night the reference time interval is 1 hour.

The calculation method for any plant which is relatively fixed in location is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the "Method for activity L_{Aeq}" described in section F.2.2 or the "Method for plant sound power level" described in section F.2.3.

The calculation method for site mobile plant such as lorries and dump trucks is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the "Method for mobile plant using a regular well defined route (e.g. haul roads)" described in section F. 2. 5.

Ground Absorption has been calculated using the technique set out in BS 5228-1: 2009 + A1: 2014, Annex F, assuming 60% to 80% soft ground between the extraction / infilling areas and the receiver locations.

The method of assessing screening is that attributed to Maekawa as used in BS 5228-1: 2009 + A1: 2014, Annex F and various other Government published documents. This method uses the calculated path difference and octave band noise data for each noise source over the frequency range stated in BS 5228-1: 2009 + A1: 2014, Annex F.

The effects of ground absorption are not used in the calculations if screening has been assessed and offers a higher attenuation.

The nearest distances to the respective dwellings, from the various items of plant, have been used in an acoustic model for the site to calculate the reasonable worst case $L_{Aeq,T}$ site noise levels.

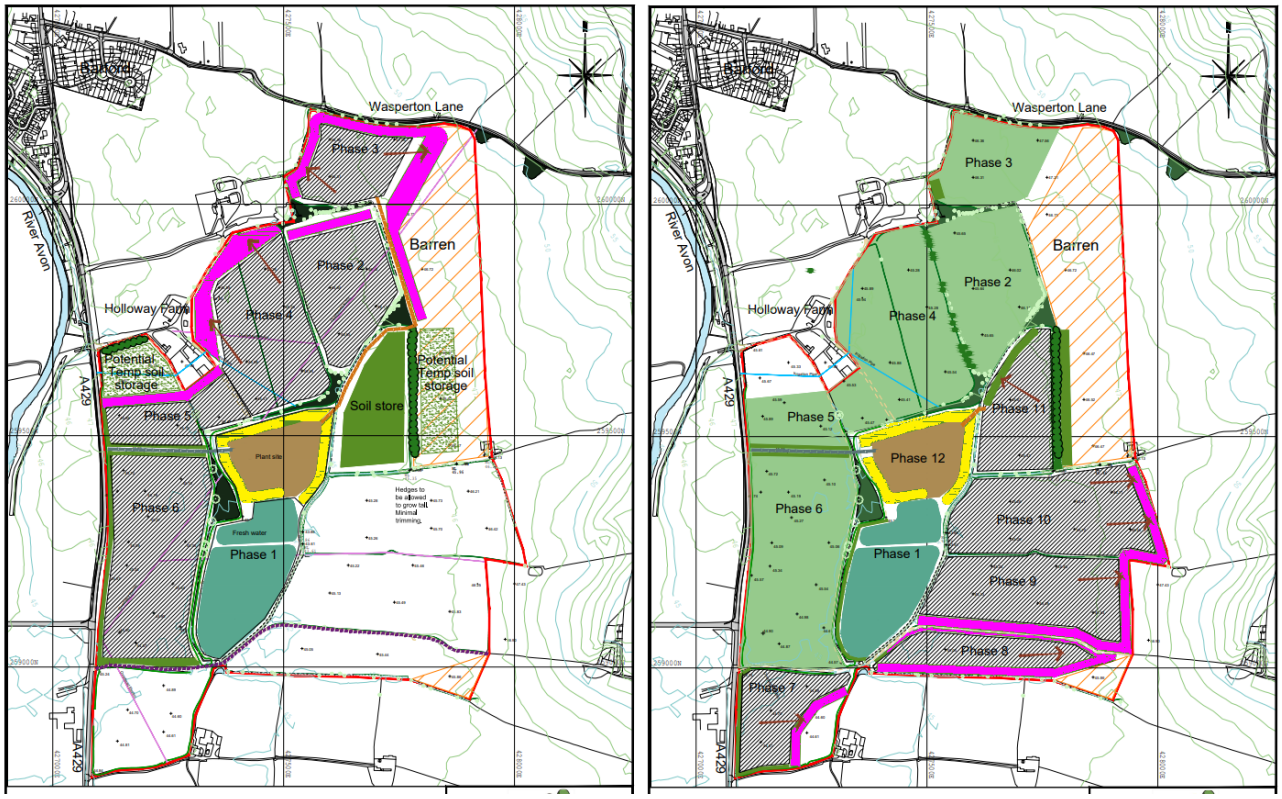
An example noise calculation sheet for one of the receiver locations is included below.

Appendix H (continued)

	Smiths Concrete	**5184**	**11-Jan-22**	**SL/RS**										
							Receiver Height :	1.5	m					
	Wasperton Quarry													
			Activity	Power LWA	% hourly	Capacity	Source		2 way flow	Speed			BS5228	
Ref	Plant Item	Comments on Plant	LAeq @ 10 m	or LWA / m	On-time	Tonnes	Height		Q per hour	V kph	Plant Set back(m)		method	
1	Excavator in nearest phase	Mineral extraction	77	105	100		2				0	m back	1	Activity
2	Processing Plant	Plant site	82	110	100		4				0	m back	1	Activity
3	HGVs on Access Road	WBM Plant Noise Database	76	104	100		2		16	15	0	m back	4	Haul Road
4	Dump Trucks within nearest Phases	WBM Plant Noise Database	77	105	100		2				0	m back	3	Defined Are
5	Loading Shovels, 2 at Plant Site	WBM Plant Noise Database	79	107	100		2				0	m back	1	Activity
6	Dewatering Pump/Generator	Data Sheet	68	96	100		1				0	m back	1	Activity
7	HGV Movement on internal haul routes	WBM Plant Noise Database	76	104	100		2				0	m back	3	Defined Are
8	Tipping of Infill	WBM Plant Noise Database	79	107	10		1				0	m back	1	Activity
9	Dozer grading infill	WBM Plant Noise Database	80	108	100		2				0	m back	1	Activity
10	Lagoon pumps with diesel generators		65	93	100		1				0	m back	1	Activity
11														
12	Excavator on Soils/Overburden in phase	Temporary Operations	79	107	100		2				0	m back	1	Activity
13	Excavator on Soils/Overburden in soil store	Temporary Operations	79	107	100		2				0	m back	1	Activity
14	Dump Trucks on Soils/Overburden	Temporary Operations	77	105	100		2				0	m back	3	Defined Are
15	Dozer on Soil store	Temporary Operations	80	108	100		2				0	m back	1	Activity
	Location No.	**4a**	**Holloway Farm**											
	Receiver Height	48.5	m AOD											
						Suggested Site Noise Limit								
	Site Noise Level for Extraction and Infilling (1 to 10)	**55**	**dB LAeq, 1 hour, free field**		Routine Operations	55	**dB LAeq, 1 hour, free field**							
	Site Noise Level for Item 12 to 15	**63**	**dB LAeq, 1 hour, free field**		Temporary Operations	70	**dB LAeq, 1 hour, free field**							

Ref	Plant Item	Plan Distance	Working Distance	Ground Height	Working Height/depth	Source Height	Angle Degrees	Range Metres	Barrier -Receiver	Barrier Height	Path Diff.	Barrier Atten.	Soft Ground %	Ground Atten.	Resultant LAeq
1	**Excavator in nearest phase**	130	140	46.0	-0.5	47.5	0	0	110	49.0	0.035	6.9	90.0	3.4	47.2
2	**Processing Plant**	340	340	45.0	0.0	49.0	0	0	285	51.0	0.047	9.1	90.0	4.3	42.3
3	**HGVs on Access Road**	215	215	46.0	0.0	48.0	65	0	0	0.0	-1.000	0.0	90.0	4.2	39.3
4	**Dump Trucks within nearest Phases**	130	140	46.0	-0.5	47.5	0	210	110	49.0	0.035	7.8	90.0	3.4	43.3
5	**Loading Shovels, 2 at Plant Site**	340	340	45.0	0.0	47.0	0	0	285	51.0	0.153	11.7	90.0	5.1	36.7
6	**Dewatering Pump/Generator**	115	215	45.0	-0.5	45.5	0	0	80	48.0	0.004	4.9	90.0	4.2	36.5
7	**HGV Movement on internal haul routes**	115	125	46.0	-0.5	47.5	0	225	80	48.0	0.000	4.9	90.0	3.1	46.2
8	**Tipping of Infill**	115	125	45.0	0.0	46.0	0	0	80	48.0	0.021	7.3	90.0	3.1	39.8
9	**Dozer grading infill**	115	125	45.0	0.0	47.0	0	0	80	48.0	0.004	5.4	90.0	3.1	52.7
10	**Lagoon pumps with diesel generators**	395	395	45.0	0.0	46.0	0	0	380	51.0	0.812	13.4	90.0	5.4	19.7
11															
12	**Excavator on Soils/Overburden in phase**	55	55	46.0	0.0	48.0	0	0	0	0.0	-1.000	0.0	90.0	1.5	62.7
13	**Excavator on Soils/Overburden in soil store**	410	410	46.0	0.0	48.0	0	0	0	0.0	-1.000	0.0	90.0	5.5	41.3
14	**Dump Trucks on Soils/Overburden**	55	55	46.0	0.0	48.0	0	250	0	0.0	-1.000	0.0	90.0	1.5	53.7
15	**Dozer on Soil store**	410	410	46.0	0.0	48.0	0	0	0	0.0	-1.000	0.0	90.0	5.5	42.3

Appendix I – Plan Showing Bunds Included in Site Noise Calculations



5m high bunds **3m high bunds**

It is assumed that:

- 5m bunds are located around plant site for lifetime of quarry
- 3m high bunds are located around working areas

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