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BRIDGE STREET NORTH ENVIRONMENTAL RISK ASSESSMENT

RAMBOLL

BRIDGE STREET NORTH
ENVIRONMENTAL RISK ASSESSMENT

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APPENDICES

1. INTRODUCTION

Ramboll UK Limited (Ramboll) was commissioned by Dunton Technologies Limited ('Dunton', the 'Operator' or the 'Client') to prepare an Environmental Risk Assessment (ERA) for its proposed waste treatment facility located at Bridge Street North, Smethwick, B66 2BZ (the 'Facility' or the 'site'). The ERA has been prepared in support of the Client's application for an Environmental Permit (EP).

The objective of the ERA is to identify the scenarios where pollution to air, water or land could occur, particularly where there is the likelihood of an accident. The Environmental Risk Assessment (ERA) has been carried out based on the Environment Agency's (EA) EPR H1 Guidance.

In accordance with the aforementioned guidance, this ERA is structured as follows:

1. Identification and consideration of risks for the Facility and sources of the risks.
2. Identification of receptors (people, animals, property and anything else that could be affected by the hazard) at risk from the Facility.
3. Identification of possible pathways from the sources of the risks to receptors.
4. Assessment of the risks relevant to the specific activities carried out at the site and consideration of which risks can be screened out as negligible.
5. Description of measures to control identified risks.

2. IDENTIFICATION OF ENVIRONMENTAL RISKS

2.1 Source-Pathway-Receptor Concept

In order for pollution to have an impact on the environment, a pollution linkage must be present which relies on the Source-Pathway-Receptor concept, where all three factors must be present and linked for a potential risk to exist.

A "pollution linkage" requires the following:

i) A "source" is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters;

ii) A "receptor" is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters; and

iii) A "pathway" is a route by which a receptor is or might be affected by a contaminant.

Identification of the source, pathway and receptor enables management interventions to be made to manage the environmental risks and avoid pollution reaching the receptor.

In this section the potential sources (environmental risks) of pollution at the Facility are identified and screened for their significance, and the potential pathways and receptors are identified.

2.2 Environmental Risks

The Operator is required to identify the environmental risks (sources of potential contamination) which could occur during the operation of the Facility, including any risks which may arise from accidents. The EA online guidance[1] stipulates that the Operator must consider the following potential risks:

- any discharge (e.g. sewage or trade effluent to surface water or groundwater);
- accidents;
- odour;
- noise and vibration;
- uncontrolled and unintended ('fugitive') emissions (for which risks include dust, litter, pests; and pollutants that shouldn't be in the discharge); and
- visible emissions (e.g. smoke or visible plumes).

In considering the risk, the Operator can determine that a potential risk is not considered to be significant in terms of its potential impact on the environment; however, a justification must be provided for any risk which is 'screened out'.

Based on the guidance summarised above, the potential environmental risks at the Facility have been identified and have been determined either significant or not significant based on the potential environmental impact arising from the risk. A summary of these risks is presented in the table below which also provides justifications where risks are considered to be insignificant. The risks which have been identified as significant have been included in the risk assessment in Section 5 of this report.

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risks-from-your-site

Table 2.1: Screening of Environmental Risks

Environmental Risk	Applicability	Justification
Controlled discharges to surface waters	Not Applicable	There are no controlled discharges to surface water from the Facility. This risk has not been considered for further assessment.
Controlled discharges to Groundwater	Not Applicable	There are no controlled discharges to groundwater from the Facility. This risk has not been considered for further assessment.
Accidents	Applicable	Plant or Equipment Failure: The failure of plant or equipment may result in an incident occurring which could potentially impact on the environment. Fire and potential for firewater runoff. Materials Handling: Wastes to be processed will be stored in dedicated storage bays within the building. Wastes will be transported across the Facility via HGV trucks and hoppers with enclosed conveyor belts. Raw materials are stored within drums and kegs in a dedicated storage area within the building. There is the potential for accidents (e.g. spills, leaks etc.) to occur during the filling of the above ground fuel tank and the movement of materials, which may result in contaminated run-off. Vandalism: The Facility is located in a mixed commercial, light industrial and residential setting. The risk of vandalism cannot be discounted. Operator Error: All processing plant is manually operated, and the potential for operator error cannot be ruled out. Mixing of Waste Streams: Hazardous waste and non-hazardous waste are to be received, stored and treated at the site. Mixing of waste streams cannot be ruled out.
Odour	Applicable	Emissions from the Installation have the potential to be odorous, if not appropriately managed.
Noise & Vibration	Applicable	Operations at the Facility have the potential to produce noise if not appropriately managed, in particularly the movement of Heavy Goods Vehicles making deliveries to and collections from the site.
Visual Impact	Not Applicable	The Facility is bordered to the north by an arm of the Birmingham canal, beyond which is an embankment and a second arm of the Birmingham Canal, prior to the presence of residential dwellings. The Facility is bordered to the south by the Engine Arm Aqueduct, beyond which are commercial and light industrial buildings. Visible emissions from the Facility will be limited to dust generated by road vehicles. These emissions are not considered to be significant in terms of visual impact. Based on this, visual impact has not been considered to be significant and has not been included for further assessment.

Environmental Risk	Applicability	Justification
Emissions to air and water	Applicable	Fugitive emissions of dust and odour may be generated during the movements of materials around the site Surface Water: potential for blocked/ damaged drains or misconnections in the drainage system to result in an uncontrolled release of process wastewater to ground or surface water. Storm water discharges: storm water run-off from the site roofs and yard areas is directed via an integrated wastewater and storm water drainage system flowing towards the north-east of the site. A sump with an isolation valve will be present in the centre of the site which will be closed during fuelling, and four damp down sumps will be present within the warehouse building. The drainage system will flow into a silt trap / full retention interceptor in the north-east of the site, before flowing into two 10,000 litre holding tanks within a concrete bund, after which the water will be tested and subsequently discharged to the foul water sewer.
Controlled releases to air	Applicable	There will be four emission points at the facility, to be defined as: • A1 – extraction from the asbestos storage bays • A2 – extraction from the non-hazardous/biopad bays • A3 – extraction from the asbestos hopper • A4 – extraction from the asbestos picking cabin The extracted air will pass through an abatement unit containing a HEPA filter and carbon filter.
Global Warming Potential	Applicable	Indirect emissions arise from the use of electricity, and water. There are no direct emissions produced by the facility.
Facility Waste	Applicable	Hazardous and non-hazardous wastes will be produced at the Facility as a result of the production processes, maintenance and administrative functions.

3. IDENTIFICATION OF RECEPTORS

A receptor is defined as something that could be adversely affected by a pollutant. Based on desk-based research, information provided by the Client and the information relating to the environmental setting (provided in the SCR), Ramboll has identified the receptors within the vicinity of the site. A summary of the identified receptors is provided in Table 3.1 below.

Table 3.1: Summary of Identified Receptors

Receptor	Location
Groundwater: The site is underlain by superficial deposits classified as a Secondary A Aquifer, which are further underlain by bedrock geology classified as a Principal Aquifer. The site is located within Source Protection Zone 3 (Total Catchment). The EA currently classifies groundwater beneath the site (Tame Anker Mease – Permo-Triassic Sandstone) as being of 'poor' quantitative status and 'poor' chemical status under the Water Framework Directive (WFD) classification scheme. There are no active licensed groundwater abstractions within a 1 km radius of the site. There are no licensed groundwater abstractions for potable water supply within a 2 km radius. Groundwater was not encountered during the 2022 ground investigation, and subsequent seepages were interpreted as perched groundwater.	On-site and in the immediate vicinity.
Surface Water: The nearest identified surface watercourse is the Birmingham Canal, of which two arms are located directly adjacent to the north and south of the Facility. The EA does not currently classify the canal arms under the WFD classification scheme. There is no connectivity to river from the canal. The nearest surface water is Hockley Brook located 980m from the site boundary. There are no active licensed surface water abstractions within a 1 km radius of the site.	Adjacent and in the immediate vicinity.
Ground: British Geological Survey mapping indicates that the site is site is directly underlain by superficial Glaciofluvial Deposits (sand and gravel). This is further underlain by bedrock geology of the Kidderminster Formation (sandstone and conglomerate, interbedded). A ground investigation undertaken at the site in October 2022 identified the following ground conditions: • Made Ground was identified across the site from ground level to depths of between 0.8 m below ground level (bgl) to 4.25 m bgl. Concrete slabs were present in every borehole location, and the underlying strata comprised dark brown to black very gravelly sand with frequent cobbles of brick. Gravel was observed to be fine to coarse angular to rounded ash, clinker, brick, concrete and quartzite. Cobbles were observed to be angular brick. Made Ground was also identified as very soft to soft brown slightly gravelly very sandy clay. Gravel was fine to coarse sub-rounded to rounded quartzite. • Glaciofluvial Deposits were identified beneath the Made Ground from depths of 1.7 m bgl to >5.45 m bgl (final depth of borehole). The strata was encountered as firm to stiff orange brown slightly sandy very gravelly	On-site and in the immediate vicinity

Receptor	Location
clay. Gravel was coarse subangular to rounded quartzite. The strata was also identified as brown to orange brown very gravelly slightly to very clayey sand. Gravel was fine to coarse rounded quartzite.	
Atmosphere: There will be four emission points across the facility. The point source release points to air are defined as: • A1 – extraction from the asbestos storage bays. • A2 – extraction from the non-hazardous/biopad bays. • A3 – extraction from the asbestos hopper. • A4 – extraction from the asbestos picking cabin. The extracted air will pass through an abatement unit containing a HEPA filter and carbon filter.	Across the entirety of the Facility
Designated Ecological Sites: There are no statutory designated ecologically sensitive sites located within 2km of the site.	>2 km
Human Occupation: Facility workers and visitors are anticipated to be present across the internal and external areas of the site. The nearest residential dwellings are located approximately 90 m north-east of the site. Commercial and light industrial units are present from 10 m east and 15 m south.	On-site and directly adjacent

4. POTENTIAL POLLUTION PATHWAYS

4.1 Identification of Possible Pathways from the Sources of the Risks to Receptors

The potential pollution pathways between the sources identified in Section 1 (excluding those which have been screened out) and the receptors identified in Section 2 are summarised in the table below.

Table 4.1: Potential Pollution Pathways

Source	Potential Pathway	Receptor
Odour: arising from the waste materials.	Through the air.	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Facility.
Noise and Vibration: arising from vehicle movements; site operations and process machinery.	Transmitted through the air and through ground vibration.	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Facility.
Accidents: including plant or equipment failure; mixing of waste streams, materials handling; vandalism; operator error; fire; and flooding.	Over site surfaces; through site drainage systems; applied to land and through the air.	*Surface water; Groundwater; Ground; Atmosphere, and Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; off-site receiving areas; and intermittent presence on pedestrian routes / roadways surrounding the Facility.
Fugitive Emissions: including dust; odour; litter; and surface water run-off.	Through the air; windblown; over Facility surfaces; through Facility drainage systems.	*Surface water; groundwater; ground; atmosphere, and humans including:* facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the site.
Controlled release to air: from point sources.	Through the air; windblown.	*Atmosphere, and humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the site.
Global Warming Potential: from direct and indirect use of fossil fuels.	Through the air.	*Atmosphere.*

Source	Potential Pathway	Receptor
Installation Waste: hazardous and non-hazardous wastes arising as a result of production processes; maintenance; and administrative functions undertaken at the Facility.	Windblown over ground; surface water run-off.	*Groundwater; surface water; ground; and atmosphere.*

5. RISK ASSESSMENT METHODOLOGY

The risk assessment provides a simple representation of the hypothesised relationships between contaminants, pathways and receptors. This allows the identification of potential contamination linkages and, therefore, an interpretation of the potential for pollution to occur at the Facility or within the vicinity of the site as a result of the activities at the Facility.

The potential for pollution to occur at the site is determined by assessing the likelihood of an identified receptor being exposed to pollution emanating from a source at the Facility and the resultant consequences of any such exposure. In determining the likelihood and the consequence of a pollution exposure the risk management techniques which are used at the Facility, and the effect on any such exposure are considered. Where the risk management techniques are considered to have a mitigating impact, the resultant overall likelihood of the pollution exposure occurring and its consequences on a receptor are lowered.

5.1 Assessing Likelihood and Consequence

Within the risk assessment, each hypothesised relationship between contaminants, pathways and receptors is assessed to determine the likelihood of the receptor being exposed to pollution and the consequences of exposure using the rankings listed in the tables below.

Table 5.1: Likelihood Rankings

Very Low	Low	Medium	High
Exposure to pollution is considered to be *highly unlikely*.	Exposure is considered to be *unlikely*.	Exposure is considered to be *likely*.	Exposure is considered to be *highly likely* to occur.

Table 5.2: Consequence Rankings

Very Low	Low	Medium	High
No impact or imperceptible impact on the receptor.	Low level impact easily and quickly mitigated or may not require any intervention to rectify any impact.	Moderate impact which will not be rectified without some mitigation / intervention.	High impact requiring significant intervention / mitigation and may have caused irreparable damage to the receptor.

5.2 Assessment of Risk

Following the determination of the likelihood and consequence rankings for the hypothesised relationships developed using the source-pathway-receptor concept, the matrix in the table below is used to determine the overall risk of the pollution exposure occurring.

Table 5.3 Risk Matrix

		Likelihood			
		Very Low	**Low**	**Medium**	**High**
Consequence	**High**	Low	Medium	High	High
	Medium	Low	Medium	Medium	High
	Low	Low	Low	Medium	Medium
	Very Low	Very Low	Low	Low	Low

6. RISK ASSESSMENT

6.1 Odour

The potential sources of odour at the Facility have been identified and used to develop the risk assessment for odour (see Table 6.1).

Table 6.1: Odour

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Odour: receiving waste materials	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Facility.	Fugitive emissions to air	The site will utilise the following measures to protect receptors against odours from site operations: • Deliveries of waste materials, ACM storage and bioremediation bays located inside a building; • Strict waste pre-acceptance and acceptance procedures; • Fast turnaround of incoming wastes for asbestos treatment; • A quarantine bay will be provided inside the building; • Limited storage time for processed wastes; • Good housekeeping; • Routine cleaning; • Regular plant maintenance; • Covered external post-treatment storage bays; • Enclosed conveyor belt systems; • Carbon filters; • HEPA filters; • Wastes kept damp; • Odour monitoring undertaken daily in accordance with Odour Management Plan.	Low to Medium	Medium	**Medium**

6.2 Noise

The potential sources of noise at the Facility have been identified and used to develop the risk assessment for noise (see Table 6.2). A detailed assessment of noise is provided separately in the Noise Impact Assessment report (1620013520-002, October 2022), and Noise Management Plan (1620013520-002, Dunton Bridge Street North, Noise Management Plant, June 2023).

Table 6.2: Noise

Source-Pathway-Receptor Hypothetical Model			**Risk Management Techniques**	**Assessing the Risk**		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Noise: arising from the movement of heavy goods vehicles (HGVs), and engine noise / alarms from other vehicles working on, and visiting the site.	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the factory	Through the air and ground vibration	• A site speed limit of 10 miles per hour will be in operation across the Facility to minimise engine noise. • Deliveries are timed so that vehicles will not 'back up' waiting to get onto the site. • A no idling policy will be enforced on-site and vehicle users will be required to switch off their engines when not in use. • The site has been designed so that vehicles delivering and removing waste will either not have to reverse, or the reversing will be kept to an absolute minimum. • Routine inspection and maintenance of roads.	Low	Low	**Low**
Noise and Vibration: arising from the internal handling of raw materials and equipment.			• Bioremediation processes are undertaken within buildings. • Enclosed hopper and conveyor belt to transport materials. • All waste will be handled with care when being loaded or unloaded. Drop heights will be minimised to reduce the impact of waste hitting site or vehicle surfaces and care will be taken to ensure any manual handling i.e. use of spades does not lead to noise from these implements. • Abatement systems such as HEPA filters and fans will operate on a 24/7 basis to control fugitive emissions at the site; however, they will be located inside a building to minimise noise. • Deliveries are only received during normal working (daylight) hours as detailed within the planning permission. The working hours are between 07:30 and 17:00 Monday to Friday and 08:00 and 13:30 Saturday. • Routine inspection and maintenance of equipment.	Low	Low	**Low**

6.3 Accidents

The risk assessment for accidents at the site is included in Table 6.3.

Table 6.3: Accidents

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Accident: Leaks and spillages	*Ground*	Over surfaces & through drainage systems	• Regular maintenance will be undertaken on all plant and equipment in accordance with the manufacturer's guidance. • Daily plant checks will be undertaken to identify and respond to any defects/leaks. • Spill kits will be provided, and staff will be fully trained on their use. • A full retention interceptor will be installed in the drainage system to capture hydrocarbons. • In the event of a spill or leak that could cause risk to the environment, the Site Manager will be informed. If necessary, works shall cease while measures are put in place to remediate the leak or spill and the Environment Agency will be informed. • Raw material will be stored indoors. • The diesel tank will be self-bunded and contained within a concrete bund and protected by a collision barrier. • The refuelling area will be located within a bund with a concrete hump to allow access to vehicles.. • An isolation valve will be installed in the drainage system serving contaminative areas. This will be closed routinely during refuelling operations. • Procedures require refuelling operations to be supervised. • Emergency response procedures will be in place at the site including leaks and spillage.	Very Low	Medium	**Low**
	Groundwater			Very Low	Medium	**Low**
	Surface Water			Very low	Medium	**Low**
Accident: Mixing of non-hazardous and hazardous waste streams	*Ground* *Groundwater* *Surface Water*	Over post treatment storage areas of the facility surfaces and receival sites	The site will utilise the following measures to ensure the segregation of non-hazardous waste streams from hazardous waste streams: • Strict waste pre-acceptance and acceptance procedures; • Treatment of non-hazardous on a 'campaign' basis; • Stringent decontamination procedure for bays that are proposed for non-hazardous waste treatment; • Clear communication and signposting of site areas/plant that are dedicated to the receival, storage and treatment of non-hazardous waste; • Daily plant checks will be undertaken to verify the location of non-hazardous waste and suitability of signposting. • Limited storage time for processed wastes; • Good housekeeping;	Low	Medium	**Medium**
Accident: Plant failure and breakdown	*Ground*	Through Facility drainage systems	• All plant will be checked on a daily basis, and any issues reported immediately. • All internal areas of the Facility feature impermeable surfaces and a sealed drainage system. • A full retention interceptor will be installed and will be inspected and cleaned regularly. • Spill kits will be available in key risk areas. • A spill response procedure will be defined in the site's Accident Management Plan. • The site will keep critical spares for important plant or parts so that minimal disruption will be experienced in the event of plant failure or breakdown. • In the event of prolonged plant failure that could lead to environmental impact, site operations may temporarily cease and any incoming vehicles will be diverted to an alternative (off-site) permitted facility for treatment. • All vehicles and plant will be turned off when not in use.	Very Low	Low	**Low**
	Groundwater			Very Low	Low	**Low**
	Surface Water			Very Low	Low	**Low**

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Accidents (Vandalism): Damage / theft of externally located equipment / tanks	*Ground*	Over Facility surfaces; and, through drainage systems.	• CCTV will cover the site, which will be secured by fencing and with authorised access only. • Site gates will be kept locked at all times when the site is not operational. • The Facility will be manned between the hours of 07:00 to 17:30 from Monday to Friday and between the hours of 08:00 and 13:30 on a Saturday. CCTV will be monitored by an external security company when the site is not manned. • Surface water run off will collect in the site drainage system which can be isolated in the event of a spill. The drain ultimately leads to the foul sewer network via a full retention interceptor. There is limited potential for contamination to reach surface water from accidents and vandalism.	Very Low	Low	**Low**
	Groundwater			Very Low	Low	**Low**
	Surface Water			Very Low	Medium	**Low**
Accidents (Fire): Fire and arson attacks	*Ground*	Over Facility surfaces; through the air; and, through Installation drainage systems.	• Due to the nature of the waste types to be accepted into the facility and the treatment activities being undertaken, it is considered that the activities are of an inherently low fire risk. • Strict waste pre-acceptance and acceptance procedures will be put in place to minimise the risk of non-compliant wastes being accepted. • The operator will undertake regular maintenance of plant and equipment in accordance with the manufacturer's guidance. • Firefighting equipment will be available on site for handling small fires. • Waste treatment and storage areas will be fully concreted and will have kerbed edgings with sealed drainage. • All chemicals will be stored in accordance with manufacturers guidance within a dedicated chemicals storage area inside the building. • The drainage system in the contaminative areas of the site will have an isolation valve installed which will contain contaminated water in the drainage system and hardstanding. Two effluent storage tanks will provide additional storage capacity of up to 20,000 litres.	Very Low	High	**Low**
	Groundwater			Very Low	High	**Low**
	Surface Water			Very Low	High	**Low**
	Atmosphere			Very Low	High	**Low**

6.4 Fugitive Emissions

The risk assessment for fugitive emissions is presented in the table below.

Table 6.4: Fugitive Emissions

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Fugitive Emissions: dust, asbestos, mud and odour	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the factory.	Through the air	• Dust and HEPA extraction systems will be in place within the main building and asbestos picking area, vented at roof level, with four emission points. • Waste materials will be stored internally in dedicated storage bays, • Material transfers will be facilitated by a covered conveyor belt system. • Post treatment bays will be roofed. • All incoming and outgoing vehicles will be sheeted or covered to prevent any load loss. • A wheel wash area will be present at the site, so that vehicles are washed down following deposition of material.	Low	Medium	**Medium**
	A*tmosphere*		• Management plans are in place and monitoring will be undertaken on a monthly basis for dust, and a daily basis for odour. • Waste will be tested using a portable analyser prior to acceptance. • Waste pre-acceptance and acceptance procedures ensure that the fibre content of the waste is below the threshold for hazardous determination. • Waste in the asbestos picking station will pass under spray bars to maintain moisture content and minimise dust formation. • Daily VOC monitoring will be undertaken using a portable photoionisation detection unit.	Low	Low	**Low**
Fugitive Emissions: contaminated surface water run-off from external areas.	*Surface Water*	Through drainage systems	• Storm water run-off from contaminative areas will be directed via an integrated wastewater and storm water drainage system flowing towards the north-east of the site. A sump is present in the centre of the site with an isolation valve, and four damp-down sumps are present in the internal warehouse building. The drainage system is transferred via two 10,000 litre holding tanks to foul sewer via a silt trap and full retention interceptor. The water will be tested prior to discharge to the foul sewer. The holding tanks will be located within a concrete bund to provide secondary containment. • The wheel wash will include a tank where water will be recycled until it is spent. When the water is spent, it will be tested prior to discharge to foul sewer via the silt trap and interceptor. • Waste treatment activities will predominantly be carried out indoors, with outdoor storage of treated waste being covered.	Low	Medium	**Medium**
	Ground water					

6.5 Controlled Releases to Air

The risk assessment for controlled releases to air is presented in Table 6.5.

Table 6.5: Controlled Releases to Air

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Controlled Releases to Air: Four extraction points from the asbestos storage bays, biopads, asbestos hopper and asbestos picking cabin	*Atmosphere* *Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the factory	Through the air	• Extracted air will pass through abatement units containing HEPA and carbon filters. • If waste requires both asbestos treatment and bioremediation, it will pass through the asbestos picking station prior to being moved to a biopad for bioremediation. • Air will ultimately be extracted from vents at roof height. • Waste soils will be kept damp to prevent dust formation and an additive will be sprayed onto the soil to treat and bind any asbestos fibres present. Whilst the waste acceptance criteria require the fibre content to be below the threshold for hazardous determination, the additive will provide additional protection for process operatives. • Routine monitoring of dust will be undertaken using Frisbee gauges and laboratory analysis. The samples will also be analysed for asbestos fibres. • MCertS monitoring of dust and TVOC will be undertaken once every six months. • Monitoring will be undertaken within the asbestos picking station in accordance with CIRIA C733 and HSG 248. Monitoring will be undertaken on a monthly basis by a third-party contractor.	Low	High	**Medium**

6.6 Global Warming Potential

Table 6.6: Global Warming Potential

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Global Warming Potential: Use of grid-sourced electricity to support production processes resulting in in-direct emissions of greenhouse gasses.	*Atmosphere*	Through the air	• Energy consumption will be monitored, recorded, and reported on a monthly basis. • Energy use will be monitored in accordance with the EMS. • The company has energy reduction targets that include Scope 1,2 and 3 emissions.	High	Very Low	**Low**

6.7 Installation Waste

Table 6.7: Installation Waste

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	**Receptor**	**Pathway**		**Likelihood of Exposure**	**Consequence of Exposure**	**Overall Risk**
Facility Waste: Wastes which arise from production and administrative activities at the site comprising: mixed recyclables; general waste; wood, cardboard and hazardous waste.	*Humans including:* Facility workers/visitors; workers on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the factory	Through the air	• Wastes from the facility are limited to asbestos, general waste from the offices, wastes from maintenance activities and containers from raw materials. • Materials will be recycled where possible, including the plastic drums and kegs in which the raw materials are supplied. • All wastes produced at the Facility will be segregated and provided with suitable containment. • All wastes will be stored within a dedicated recycling and waste area. • Asbestos waste will be double bagged and locked securely in an onsite skip ready for collection. • The management of waste will be contracted to a suitable waste contractor, who will manage and arrange collections on behalf of the Facility.	Low	Low	**Low**
	Surface Water	Over Facility surfaces; and through drainage systems		Low	Low	**Low**
	Groundwater			Low	Low	**Low**
	Ground			Low	Low	**Low**

7. ERA CONCLUSION

Ramboll has identified potential environmental risks at the Facility and determined the potential environmental impact arising from each risk. The assessment has demonstrated that with the appropriate management controls in place, risks identified are acceptable.

APPENDIX 1
NOISE IMPACT ASSESSMENT

Intended for
Dunton Environmental

Document type
Technical Report

Date
December 2022

DUNTON ENVIRONMENTAL, SMETHWICK

NOISE IMPACT ASSESSMENT

RAMBOLL Bright ideas. Sustainable change.

DUNTON ENVIRONMENTAL, SMETHWICK
NOISE IMPACT ASSESSMENT

Project name	**Dunton Environmental, Smethwick**
Report no.	**1620013520**
Recipient	**Dunton Environmental**
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Date	**2022/12/16**
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CONTENTS

SUMMARY

This noise assessment has been prepared on behalf of Dunton Environmental Ltd in support of a Permitting Application for a new ground remediation and waste processing facility located on Bridge Street North, Smethwick, Birmingham. The facility will operate during the daytime only. The nearest residential properties are around 90m away.

Noise emissions from the facility have been calculated using proprietary modelling software and measurements of the existing plant and processes at the facility in Wolverhampton. The impact of proposed operations has been assessed in accordance with BS4142:2014+ A1 2019 and compared to background noise levels measured at the nearest properties.

Noise levels from the facility may exceed background levels by around 5dB at the frontage of the nearest dwellings but given the context of the area industrial sound from the proposed development is not expected to result in any significant effects. Noise levels in external amenity areas associated with these dwellings are expected to be lower.

Residual adverse effects will be minimised through implementation of BPM and mitigation measures described in this report.

1. INTRODUCTION

This noise assessment has been prepared by Ramboll UK Limited ('Ramboll') on behalf of Dunton Environmental Ltd (the 'Client') in support of a Permitting Application for a new ground remediation and waste processing facility (the 'site') located on Bridge Street North, Smethwick, Birmingham.

The impact of noise from operation of the proposed facility has been assessed. An assessment of ground borne vibration is not considered necessary due to the large distance to the nearest properties and the nature of the processes on site which are not expected to typically generate high levels of vibration.

This report is prepared in support of the permitting application for the scheme. It is not intended to represent a full acoustic design of the proposed facility.

1.1 Location

The proposed facility will occupy the site of a former commercial/industrial premises adjacent to the canal at Bridge Street North, Smethwick. The location of the site is shown in Figure 1.

Vehicular access to the site will be from the east via Bridge Street North.

Figure 1 – Approximate red line boundary and site location

1.2 Existing and Proposed Facility

Dunton Environmental process soil and waste building materials brought in from off-site by lorry, sorted and processed, then removed from site for distribution by lorry.

A visit was made to the existing Dunton facility in Wolverhampton. Measurements of noise were made from this facility. The new facility will operate in the same way with similar plant and processes. The basic steps of the process at the facility during normal operation are:

- Delivery of materials (typically by 32t tipper)
- Moving of material on site by wheeled loader/tracked excavator
- Tipping material into a hopper and movement by conveyor to an enclosed hand-picking station (for asbestos removal etc).
- Loading material by wheeled loader/excavator into tippers for delivery
- HGV movements and wheel wash

Noise from equipment and processes at the existing Wolverhampton facility has been measured and used in the assessment to predict noise from the new facility. Details are given in Section 4.

Much of the processing of materials will take place inside the main warehouse building at Smethwick (see Figure 2) which will repurpose the current building on the site. This includes unloading of lorries and moving material by wheeled loader as well as loading the hopper and conveyor which would take material to the separate hand-picking building.

Core hours will be 07:30 to 17:00 Monday to Friday with main processes usually occurring between 08:00 – 16:30.

On Saturdays the site may be in use but normally just for maintenance and not for routine operations. Saturday hours would be 07:30 to 13:30. No Sunday working is proposed.

1.3 Non-typical operation

In addition, there may be occasional use of other machinery on the site for short periods which are not part of the primary operation of the site. This includes use of a hired mobile crusher for crushing oversized pieces. This would be used at the western end of the site where oversized materials are stored. This may be required perhaps every 2 months or so and run for 2/3 hours per day. It is more likely to be required in winter when demand for the specific type of processed material is higher.

There may also be occasional use of a mobile screen but similarly this is not part of the primary operation of the site and would be occasional use only. A screen could be located within the building on site if required. It is likely to be lower in noise than use of a crusher.

1.4 Site layout

The general layout of the Dunton Smethwick site is shown in Figure 2.

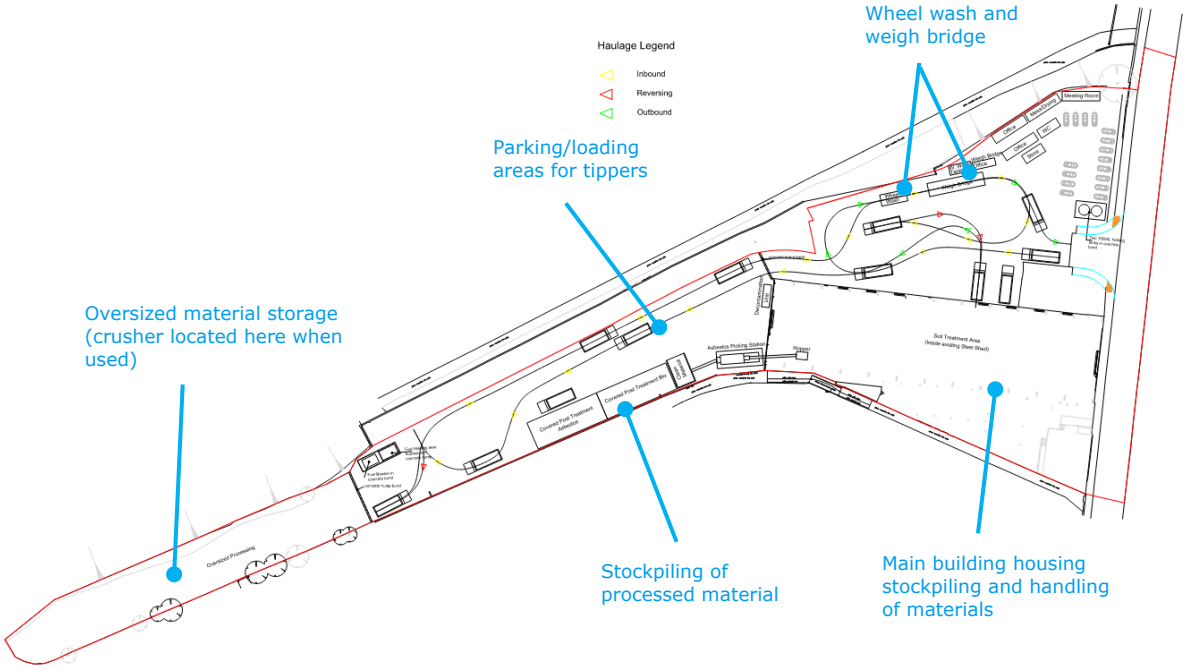

Figure 2 – General layout of proposed facility

1.5 Receptor Locations

The noise sensitive receptors considered in this assessment are summarised below. And shown in Figure 3.

Location	Description	Approx. distance from site boundary at closest point
R1	Houses on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.	90m
R2	Houses on Bridge Street South	125m

Table 1 – Nearest noise sensitive receptors

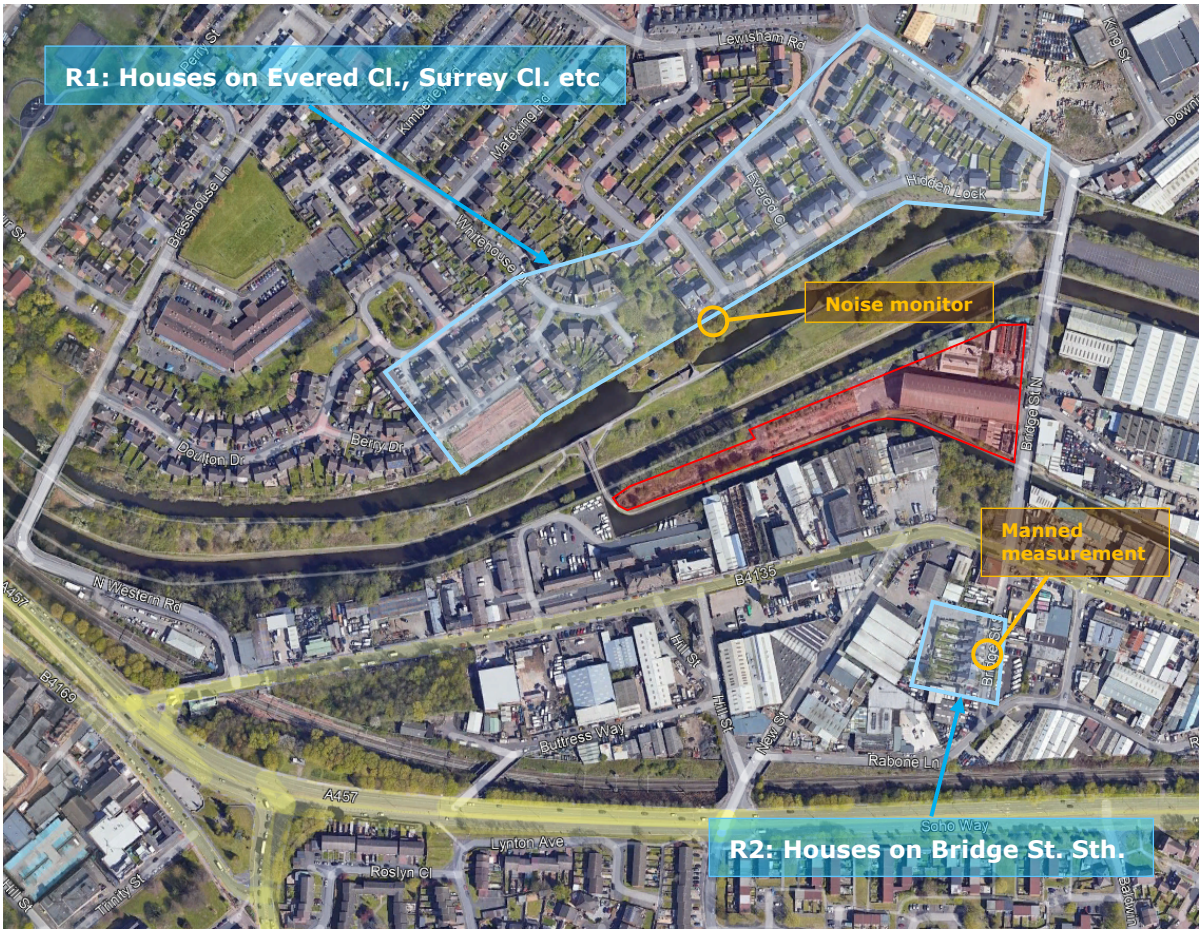

Figure 3 – Nearest noise sensitive receptors & background noise measurement positions

2. BACKGROUND NOISE

2.1 Noise Monitor

An unattended noise monitor was installed close to the houses to the north of the site at the position shown in Figure 3. The monitor ran continuously between Thursday 1st and Monday 5th September 2022.

The noise monitor was chosen to represent the background noise level at the houses located on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.

The microphone was located in free-field conditions at a height of 1.5m. Noise levels were monitored continuously over the survey period in 5-minute intervals.

2.2 Manned Measurements

Attended measurements were made at the houses on Bridge Street South at the position shown in Figure 3. Measurements were made on Monday 5 September 2022 around 13:30.

2.3 Measurement Results

The unattended survey results are shown on the graph in Figure 4. Full tabulated results are available on request.

Typical background noise levels have been determined from the measured levels and are summarised in Table 2. These have been used to represent typical background noise levels at these positions for the assessment.

Position	Typical Noise Level (ref. Figure 4)
	Day (07:00 – 23:00)
Noise Monitor	50 dB $L_{Aeq,1hr}$[1] 47 dB $L_{A90,1hr}$[1]
Manned measurement Bridge St Sth	57 dB $L_{Aeq,15mins}$[2] 53 dB $L_{A90,15mins}$[2]

[1] estimated from average of consecutive 5min measurements within each hour made by the monitor

[2] representative of the 1 hour L_{Aeq} at this position

Table 2 – Typical background noise levels

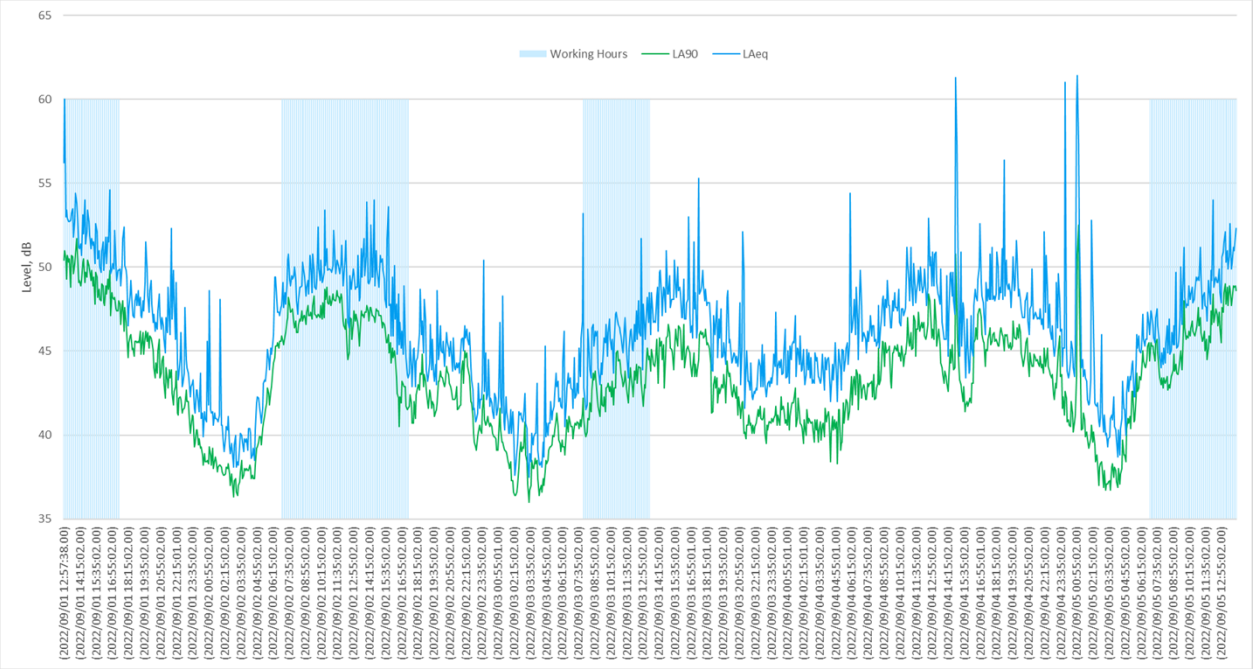

Figure 4 – Noise levels measured at Noise Monitor Position. Site operating hours highlighted in blue

2.4 Observations

It was noted that background noise affecting the area around the nearest houses at the noise monitor location included noise from traffic on Bridge Street North, as well as roads further away (for example the A457 to the south). Industrial noise from the surrounding industrial areas was also audible. Noise from plant (possibly forklifts etc) and loading/unloading of HGVs or buildings at other sites was noted. The general noise environment in the area was considered industrial in nature, which is expected given the large amount of industrial development in the immediate area surrounding the site.

3. NOISE CRITERIA

3.1 Sandwell Metropolitan Borough Council

No specific guidance on acceptable industrial noise levels is given in SMBC planning guidance. Attention is given to paragraph 7.14 of the Smethwick Area Action Plan which advises that:

"Employment sites should be identified where easy access to the strategic highway network can be achieved and where their presence will not adversely affect existing residential areas through noise, disturbance or traffic congestion".

The procedures in British Standard 4142:2014 are considered appropriate to assess any adverse effects on residential areas in relation to noise from industrial sites.

3.2 BS 4142: 2014 + A1 2019 Method for rating and assessing industrial and commercial sound

British Standard 4142:2014[1] provides a method for rating industrial and commercial sound and assessing resulting impacts upon people. The method is applicable to fixed plant installations, sound from industrial and manufacturing process and other associated activities.

The basis of BS4142 is a comparison between the background noise level in the vicinity of residential locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

i. Background Level, $L_{A90,T}$: defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, and quoted to the nearest whole number of decibels;
ii. Specific Level, $L_{Aeq,T}$: the equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T; and
iii. Rating Level, $L_{Ar,T}$: the specific sound level plus any adjustment made for the characteristic features of the noise.

Potential impacts are predicted from the difference between the representative background level at a noise sensitive receptor and the rating level from the noise source considered. The standard suggests that the greater the difference, the greater the magnitude of impact.

Section 11 of BS 4142 gives guidance for significance of impacts in reference to comparing rating noise levels against existing background noise levels:

i. Typically, the greater this difference, the greater the magnitude of the impact;
ii. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
iii. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and

[1] British Standards Institute, 2014. British Standard BS 4142:2014 +A1:2019 Methods for rating and assessing industrial and commercial sound. BSI.

iv. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

In determining the significance of the impact, BS 4142 requires a consideration of the context of the assessment i.e. the nature of the existing acoustic environment and the new noise source, and the sensitivity of the affected receptors.

Noise Characteristics and Penalties

BS4142 applies different penalties for noise sources that have an acoustic feature. These penalties are applied to the plant noise level where such features increase attention to the noise, such as tonality and intermittent operation.

BS 4142 gives a guide to the level of penalty that should be applied using the subjective method. This is summarised below.

Tonality

- *Tone just perceptible at the receptor: +2dB*
- *Tone clearly perceptible at the receptor: +4dB*
- *Tone highly perceptible at the receptor: +6dB*

Impulsivity

- *Sound that is highly impulsive just perceptible at the noise receptor: +3dB*
- *Sound that is highly impulsive clearly perceptible at the receptor: +6dB*
- *Sound that is highly impulsive highly perceptible at the receptor: +9dB*

Intermittency

- *Identifiable on/off conditions, readily distinctive against the residual acoustic environment: +3dB*

3.3 Planning Practice Guidance

Planning Practice Guidance[2] (PPG) is a web-based resource, which includes a section on noise. This resource provides guidance on how to determine the noise impact in terms of whether a significant adverse effect is likely to occur and/or whether a good standard of amenity can be achieved.

In line with the Noise Policy Statement for England, Planning Practice Guidance introduces the following concepts:

i. Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
ii. Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
iii. No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

[2] GOV.UK. 2019. Noise. Available at: https://www.gov.uk/guidance/noise--2 [Accessed September 2021].

Table 3 summarises the noise exposure hierarchy, based on the likely average response.

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, attitude or other physiological response, 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

Table 3 - Noise exposure hierarchy

In the following table we have related this to the significance of impacts described in BS 4142:2014+A1:2019 above, taking into consideration the context of the area.

Description	Typical outcome	Effect level in the context of the surrounding area
Predicted Rating Level is more than 5 dB below the prevailing Background Level at the receptor.	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response.	NOEL
Predicted Rating Level is 0 dB above the prevailing Background Level at the receptor.		NOAEL
Predicted Rating Level is 5 dB above the prevailing Background Level at the receptor.	Noise can be heard and causes small changes in behaviour, attitude or other physiological response. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	LOAEL
Predicted Rating Level is between 5 dB and 10dB above the prevailing Background Level at the receptor.	As the rating level gets higher the potential for adverse effects (material behaviour, attitude or other physiological response) increases.	
Predicted Rating Level is 10dB or more above the prevailing Background Level at the receptor.	The noise causes a material change in behaviour, attitude or other physiological response. Quality of life diminished due to change in acoustic character of the area.	SOAEL

Table 4 – Operation noise significance criteria

Given the context of the area it is considered appropriate that rating levels more than 5dB above background should be avoided where possible through suitable mitigation.

3.4 British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

With regard to noise levels in external amenity areas, BS8233 states that:

"*For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments…*"

This is in relation to noise sources without a specific character, termed "anonymous noise" (for example road traffic noise). Where the noise has a specific character, setting lower limits may be appropriate.

4. NOISE SOURCES

4.1 Measurements from Dunton Wolverhampton

As processes and equipment will be largely the same at the new site as the Wolverhampton facility, Ramboll measured samples of noise from the various activities at Wolverhampton to use in modelling noise emissions from the new site.

4.1.1 Measured Noise Levels

The processes and equipment measured, and the levels recorded are given below in Table 6. Measurements were made for the duration of the noisy activity.

Reference	Noise Source	Distance to source (m)	Duration, T mm:ss	$L_{Aeq,T}$ dB
1	Loader loading HGV with soil/aggregate	20	01:32	73
2	HGV drive by (at site exit onto road)	3	00:19	74
3	Wheeled loader moving large rocks	10	00:31	77
4	Excavator moving soil	15	00:31	71
5	Wheeled loader loading large rocks into hopper	10	00:38	79
6	Hopper and conveyor	1	00:23	86
7	Wheel wash	4	00:11	68

Table 6 – Noise levels measured at existing Dunton Wolverhampton

4.2 Noise Modelling

Specific selections of plant items have not been finalised at this stage and example plant items have been used for the purposes of this assessment where a direct measurement from the existing facility has not been possible. The noise levels used in this assessment are considered worst case and there is opportunity to develop kit selections and schemes of attenuation further.

A summary of the noise sources included in the noise modelling exercise is given below in Table 6 and the locations of these are indicated in Figure 5.

HGVs have been given a route representative of a worst case of movements within a typical hour. This assumes a one-way system is in place.

The main building on the site will be retained. The construction of this is part brick, part metal cladding. For the purposes of the assessment the large openings in the building to allow vehicles in and out are assumed to be open all the time and these are the more significant weakness acoustically, however an area source has been used to represent sound radiating from the roof of the building, with the sound insulation of 0.7mm corrugated steel (uninsulated) applied.

Noise from within the building has been calculated by using the noise level measured from the external operating hopper/conveyor and a wheeled loader to calculate a reverberant level inside the building. Area sources have been used to represent this noise breaking out of openings in the building, through which vehicles will travel. It is assumed that any roller shutter doors are open around the building.

Modelling has been undertaken using full octave frequency spectrum data taken from measurements or datasheets for examples of similar plant, as set out in the references given.

Noise Source	Measurement/Data Used	On-time (mins per hour)	Sound Level (per item)
Inside Building			
Internal reverberant level comprising noise measured from a wheeled loader moving rocks and a hopper/conveyor	Calculated from Table 2, Ref 3 & 6	60	80 dB L_{pA}[1]
External Activity (normal operation)			
HGV movements	Table 2, Ref 2. Typical route assumed	5 per hr	99 dB L_{wA}[2]
Excavator working outside	Table 2, Ref 4. Typical route assumed	15	106 dB L_{wA}[2]
Wheel wash	Table 2, Ref 7	10	91 dB L_{wA}[2]
External Activity (occasional use)			
Crusher	BS5228 Table C.1, ref 14 – 47t semi-mobile crusher	40	113 dB L_{wA}[2]

[1] internal reverberant level

[2] Sound power level calculated from LpA measured at a given distance

Table 7 – Noise sources used in modelling and assessment

4.2.1 Traffic generation on the surrounding roads

Access to and from the site will be via Bridge Street North to the east of the site. 20-25 HGVs per day are expected. We have assumed a worst case of 5 HGVs per hour in our calculations. Given the context of the site within a much larger industrial area, and the existing numbers of HGVs and other vehicles observed using this road during the noise survey, the small number of lorries associated with this site is not expected to result in a significant increase in noise generated on Bridge Street North.

5. CALCULATED NOISE LEVELS

5.1 Noise from site operations

A model of the proposed facility and the surrounding area was created in CadnaA software and used to calculate noise emissions from the facility experienced at the nearest sensitive properties.

5.1.1 Acoustic Penalties

Noise from the facility will be made up from a number of diverse plant sources and the cumulative noise is not expected to have any distinct tonality. It is noted however that vehicles are likely to include reverse alarms, although it is assumed that they will use white-noise type alarms to reduce impact as part of Best Practicable Means.

Plant and vehicles will be used as required through the day, and as such a penalty of **+3dB** has been applied to the cumulative noise from the site to account for intermittent use of external vehicles. BS4142 recommends this penalty where the noise has "Identifiable on/off conditions, readily distinctive against the residual acoustic environment".

5.1.2 Calculated Process and Plant Noise Levels

The level of industrial noise (the specific sound level) calculated at the nearest sensitive receptors are summarised in Table 8 below. A noise map showing noise emissions across the site and the nearby surrounding area is shown in Figure 5.

Location	Calculated specific sound level, dB $L_{Aeq,1hr}$	Acoustic penalty	Rating Level, dB $L_{Ar,1hr}$	Existing background noise level during operating hours (08:00 – 16:30), dB L_{A90}	Difference, dB
R1 Front of houses on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.	48-49	+3	52	47	+5
R2 Houses on Bridge St Sth	33	+3	36	53	-17

Table 8 – Calculated noise levels from Dunton Smethwick facility

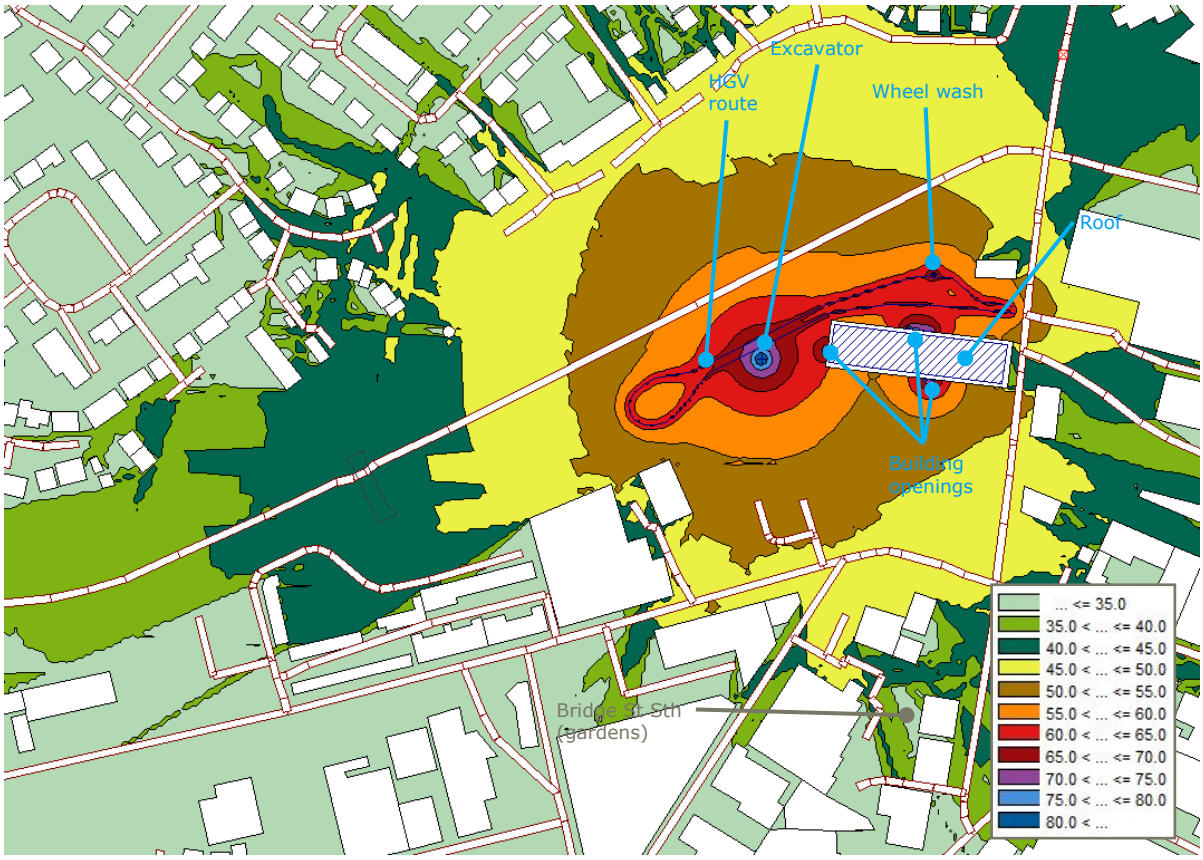

Figure 5 – Calculated specific sound levels, dB $L_{Aeq,1hr}$ at 1.5m height, daytime working hours

5.1.3 Discussion

Calculations have been made based on an estimate of typical operation within a typical hourly period.

Nearest houses

The cumulative noise rating level from the proposed facility could be up to 5dB higher than the background noise level measured outside the nearest houses to the north. It should be noted however that this is at the frontage of these houses where there are no external amenity areas. The area facing the site includes access roads and parking only.

With reference to Table 4, the projected rating level is between the LOAEL and SOAEL values for normal daytime operations.

At this level, industrial noise from the proposed development could result in small changes in behaviour, attitude or other physiological response, as the noise would be audible, however given the working hours of the site and the fact that the frontage of the houses are not used for relaxation etc, there is not expected to be any significant effects – i.e. change in the quality of life or change to the character of the area.

External amenity areas

When accounting for the site context, it is considered that industrial noise from the proposed development could have a greater impact on the external amenity areas associated with these properties . These include gardens of the houses, all of which are screened by the house itself or are further from the site.

As noted in Section 3.4, BS8233 advises that for "anonymous" sources of noise, levels in external areas should normally be limited to 50dB $L_{Aeq,T}$ where possible (and 55 dB $L_{Aeq,T}$ in noisier environments). However, in this case a lower limit would be appropriate to account for the fact that industrial noise from the site will be audible over the general background noise in the area and as such is not considered anonymous.

A upper threshold of 45dB L_{Aeq} in garden areas is considered suitable to assess the likely risk of industrial noise resulting in adverse effects on the use of the gardens. This is in comparison to the existing ambient noise levels in the area which are around 50dB $L_{Aeq,1hr}$ during the working hours of the site.

The daytime average industrial noise level from the site predicted in these gardens is 32 to 40dB $L_{Aeq,T}$ and significantly lower than the 45dB $L_{Aeq,T}$ upper threshold, and lower than the existing ambient noise level in the area that was determined during the survey.

Industrial noise levels predicted in the gardens of the houses to the south on Bridge Street South are much lower than the existing background noise level and ambient noise levels measured in this area during the survey.

On this basis, given the context of the area and the current industrial operations and traffic noise sources, industrial noise from the proposed development may be audible in gardens and amenity areas but is unlikely to result in any adverse effect on these areas (change in behaviour or quality of life to nearby residents). This is particularly the case given the limited working hours of the site - no significant noise would be generated at times when residents would be more sensitive to noise or using amenity areas, i.e. evenings and at night.

5.2 Occasional operations

Noise levels during use of temporary hired equipment such as a crusher on the site may be higher for short periods. Using noise data for a typical tracked semi-mobile crusher (47t) with a sound power of 113dB L_{wA}, the level at the frontage of the nearest houses may be up to 59dB $L_{Aeq,1hour}$, before any attenuation or mitigation (note that this is an example unit and quieter equipment may be available), and up to 12 dB above the existing daytime background noise level.

This above has the potential to result in adverse effects since the industrial noise level would be above the Significant Observed Adverse Effect Level (SOAEL) during this temporary operation. The likelihood for significant effects will be lessened through implementing of Best Practicable Means (BPM) of noise control, as discussed below, and by the fact that its use is limited in frequency and duration.

5.3 Best Practicable Means

The impact of noise from operation of the Dunton Smethwick facility should be limited by implementing Best Practicable Means for operation of the site and use of plant and equipment. This may include:

- Use of low noise plant and equipment, in particular excavators or wheeled loaders used outside of the building.
- Use of white-noise reverse alarms
- The loading/parking area for tippers is already located at a favourable position such that it provides some screening during loading operations from the HGVs themselves. While this has not been included in the modelling, it has been tested and the presence of HGVs can provide useful screening of noise.
- Careful use of plant, such as avoiding dropping materials form heights higher than necessary.
- Limiting use of metal storage containers externally to avoid noise from material being loaded into them. In practice most material is stored at ground level in piles, which is more favourable.
- Maintaining good relationships and communication with neighbours. For example informing residents of any particularly noisy activity and its duration and hours.
- For short term noisy activity such as use of a hired crusher, provide localised acoustic barriers or other screening around the activity where required. Minimise use of the equipment as far as possible and use the quietest ways of operating the machinery as possible. Use during the less sensitive parts of the day (i.e. avoid use in the earliest part of the morning working hours).
- Use stockpiled material along the north perimeter of the Oversized Material area to provide a screen to the crusher.
- Routing HGVs on main roads and avoiding routes along smaller roads closer to residential properties.

6. CONCLUSIONS

The proposed Dunton Smethwick facility is expected to produce industrial noise levels that are likely to be audible at the nearest properties. However, the likelihood of adverse effects due to industrial noise would be limited given the restricted working hours of the site and the industrial context of the surrounding area.

Industrial noise rating levels may exceed existing daytime background noise levels by up to 5dB at the frontage of the nearest houses. Given the context of the area it is considered that rating levels up to 5dB higher than background are unlikely to result in any significant effects. This is because the existing environment already includes sound of an industrial nature at the nearest receptors. Industrial noise rating levels more than 5dB above background should be avoided where possible through suitable mitigation.

Residual adverse effects due to industrial noise will be minimised through implementation of BPM and mitigation measures described in this report.

6.1 Assumptions and Limitations

All reasonable measures have been undertaken to reduce uncertainty in the baseline noise survey data and the calculations detailed in this report.

Uncertainty has been minimised by measuring noise from the actual plant used at the current facility rather than deriving from manufacturers data where possible.

Results have been rounded to the nearest A-weighted decibel.

The noise prediction model accounts for intervening topography and existing building massing. The model uses the calculation method of ISO9613-2:1996.

Noise emissions are based on benchmarking measurements from the existing facility in order to include the spectral content to account for the way different frequencies of sound propagate.

The assessments and calculations undertaken in this report are based on data and plans of the proposed development provided by the Client.

APPENDIX 1
NOISE SURVEY DETAILS

Date & time of survey
Sample measurements of activity and plant at Dunton Horsley Fields, Wolverhampton: Thursday 1st September 2022.

Noise monitor: Thursday 1st September 12:57 to Monday 5th September 14:15

Personnel
Matthew Bull (Ramboll)

Equipment
Manned measurements and noise monitor:
Sound level meter: Norsonic Nor140, serial # 1404236
Calibrator: Norsonic 1251, serial # 32190

The sound level meter was calibrated before and after the surveys with no significant drift noted.

Weather conditions
Generally clear, low wind speeds
Temperature generally 16 – 20 °C

Measured noise levels
In body of report. Full octave band data available on request