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Booth Ventures Waste (Midlands) Ltd

Report No. 5430-BLP-R-004-02

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## Sandown Quarry Landfill

Environmental Permit Application – Amenity /  
Environmental Risk Assessment (H1)



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## Document Control

Document: Environmental Permit Application – Amenity / Environmental Risk Assessment (H1)

Project: Sandown Quarry Landfill

Client: Booth Ventures Waste (Midlands) Ltd

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**Disclaimer: Please note that this report is based on specific information, instructions and information from our Client and should not be relied upon by third parties.**

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# 1 Introduction

## 1.1 Background

This document, prepared by ByrneLooby supports the permit application (summary provided in report reference 5430-BLP-R-01-02). The current site is an active quarry. This permit application proposes to infill the existing quarry void as a restoration activity. In support of the restoration operation imported wastes with a recoverable composition will be processed to recover aggregates in accordance with the quality protocol approved by the Environment Agency (the Agency). It is anticipated that approximately 5% of the wastes imported will be suitable for processing (crushing and/or screening). The following data sources have been consulted in the preparation of this permit application report including:

- <https://magic.defra.gov.uk/magicmap.aspx>
- <https://osmaps.com/>
- <https://earth.google.com>
- <https://www.metoffice.gov.uk/research/climate/maps-and-data/data/index>
- <https://wind.willyweather.co.uk/>
- Horizontal Guidance Note H1 Overview Document (v2.1 December 2011) – *now withdrawn*
- <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

This risk assessment has been undertaken using current Environment Agency (the Agency) guidance issued on [www.gov.uk](http://www.gov.uk) and makes reference to potential impacts on local amenity. The guidance referenced identifies the following step process to risk assessments which can be summarised as:

- Identify risks;
- Identify receptors;
- Identify possible pathways
- Assess relevant risks; and
- Control risks.

The guidance indicates that the following parameters require assessing:

- Any discharge;
- Accidents;
- Odour;
- Noise and vibration;
- Fugitive emissions (no statutory limits for dust);
- Release of bioaerosols (not applicable to Sandown Quarry Landfill).

The guidance requires that receptors are considered with regard to the proximity of the site. Table 1, in Section 2.1 of this report identifies the most likely sensitive receptors adjacent to site, this has been compiled using information available through internet-based searches.

The following separate risk assessments have been carried out as part of this variation application:

- Hydrogeological Risk Assessment (reference 5430-BLP-R-006-02, HRA);
- Landfill Gas Risk Assessment (reference 5430-BLP-R-007-02, LFGRA); and
- Stability Risk Assessment (reference 5430-BLP-R-008-02).

In view of the above, the impact of fugitive emissions to groundwater and surface water; waste mass and engineering stability; and generation of landfill gas will not be considered further by this H1 assessment.

## 1.2 Assessment of Environmental Risk for Accidents, Odour, Noise and Fugitive Emissions

The Agency guidance requires that everyone applying for a new landfill environmental permit (other than a standard permit) or variation to an existing permit should present information in the form of risk assessment tables, one table each for odour, noise and vibration, fugitive emissions (including dust, and litter) and pests and vermin and global warming potential. Identification of accidents scenarios and their prevention through operational management should also be detailed. Each table should identify the hazard, the potential receptors and the pathway from the hazard to those receptors. In addition, the tables should also include the preventative risk management practices to be employed along with an assessment of the mitigated risk.

Restoration of the site will be completed as per the information contained within the Environmental Setting and Site Design (ESID) report (5430-BLP-R-003-02).

## 2 Environmental Risk Assessment – H1 and Amenity

### 2.1 Overview and Assessment Scope

This risk assessment has been undertaken using current Environment Agency (the Agency) Guidance issued on [www.gov.uk](http://www.gov.uk). The guidance referenced identifies a four-step process to risk assessments which can be summarised as:

- Risk identification;
- Risk assessment;
- Appropriate control; and
- Presentation of assessment.

The guidance indicates that the following parameters require assessing, odour; noise and vibration; fugitive emissions including dust, mud and debris; and accidents. The guidance also requires that receptors are considered with regard to the proximity of the site.

An appraisal of Site receptors has been undertaken, Table 1 identifies the most likely sensitive receptors adjacent to site, this has been compiled using information available through internet-based searches.

The locations of these receptors are indicated on drawing ESID 2 and ESID 3, further details are provided in report 5430-BLP-R-003-02.

**Table 1 Sensitive Receptor Review**

Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
1	Residential properties on Stubbers Green Road	Residential	20	SW	4
2	Residential properties on New Street	Residential	125	NW	9
3	Residential properties on Swan Pool Grove	Residential	130	W	1
4	Residential properties on Brook Meadow Road	Residential	150	W	1
5	Residential properties on Woodhaven	Residential	180	W	1
6	Residential properties on Broadheath Drive	Residential	240	W	1
7	Residential properties on Woodbridge Close	Residential	210	NNW	22
8	Ormiston Shelfield Community Academy	School	850	SE	4
9	St John's CE Primary School	School	1230	NNE	10
10	Leighswood Primary School	School	960	ESE	2
11	St Francis Catholic Primary School	School	520	WNW	5
12	Greenfield Primary School	School	870	W	1
13	Radleys Primary School	School	900	SW	4
14	Greenfields Allotments	Recreation	670	N	14
15	Aldridge Sailing Club	Recreation	200	SW	4
16	Open parkland around The Swag	Recreation	40	W	1
17	Recreation Ground	Recreation	450	W	1
18	Sandown Brickworks	Industrial/Commercial	40	S	2
19	Empire Industrial Estate	Industrial/Commercial	80	E	5
20	Veolia Empire Work (waste treatment)	Industrial/Commercial	15	N	14
21	Highfields South Landfill Site	Industrial/Commercial	250	N	14
22	Vigo Utopia Landfill Site	Industrial/Commercial	210	NNE	10
23	Linley Lodge Industrial Estate	Industrial/Commercial	590	SSW	4
24	Mercian Weldcraft Factory	Industrial/Commercial	280	SSE	0
25	Ibstock Brick Atlas brickworks	Industrial/Commercial	430	SSE	0
26	Ibstock Brick Atlas open quarry	Industrial/Commercial	410	S	2
27	Daw End Branch	Canal	15	E	5
28	Swan Pool	Pond	10	W	1
29	The Swag	Lake	75	W	1
30	Unnamed pond	Pond	90	NNW	22
31	Brick Kiln Pool	Pond	200	N	14
32	Unnamed pond	Pond	220	S	2
33	Unnamed pond	Pond	500	WSW	2
34	Unnamed pond	Pond	210	SSE	0
35	Unnamed pond	Pond	330	NE	7
36	On-site Drain – Highfield South	Site Drainage	320	N	14

Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
37	Unnamed drain	watercourse	5	W	1
38	Unnamed drain	watercourse	20	NW	9
39	Unnamed drain	watercourse	300	W	1
40	Unnamed drain	watercourse	200	NNW	22
41	Unnamed drain	watercourse	50	S	2
42	Swan Pool and The Swag SSSI	SSSI	0	W	1
43	Stubbers Green Bog SSSI	SSSI	50	S	2
44	Jockey Fields SSSI	SSSI	340	N	14
45	Daw End Railway Cutting SSSI	SSSI	1250	SSW	4
46	Dumblederry Lane LWS	LWS	220	SW	4
47	Anchor Brook Valley LWS	LWS	70	S	2
48	Daw End Branch Canal LWS	LWS	15	E	5
49	Stubbers Green LWS	LWS	15	W	1
50	Stubbers Green Road	Road	20	W	1
51	Barns Lane	Road	50	SW	4
52	Unnamed access road to Veolia Site	Road	20	ENE	8
53	Empire Close	Road	140	E	5

Frequency stats from [Walsall Wood Wind Forecast, West Midlands WS9 9 - WillyWeather](#).

The Agency guidance requires that everyone applying for a new landfill environmental permit (other than a standard permit) or variation to an existing permit should present information in the form of risk assessment tables, one table each for odour, noise and vibration, fugitive emissions (including dust, and litter) and pests and vermin and global warming potential. Identification of accidents scenarios and their prevention through operational management should also be detailed.

Each table should identify the hazard, the potential receptors and the pathway from the hazard to those receptors. In addition, the tables should also include the preventative risk management practices to be employed along with an assessment of the mitigated risk.

A summary of potential emission points and types of emissions which may arise are summarised in Table 2.

**Table 2 Potential Effects of the Waste Activity**

Activity	Potential Harmful Effect						
	Odour	Dust	Litter	Visible Plumes	Pests and Vermin	Noise	Water Pollution
Transport of non-hazardous waste to site	x	x	x			x	
Use of Site Haul Road		x				x	
Deposit of waste	x	x	x	x	x		
Use of Plant		x				x	
Vehicle fuels, lubricants etc							x
Site Restoration		x				x	
Aggregate Screening		x				x	

- Water Pollution is considered in the Hydrogeological Risk Assessment (from the landfill / infill scheme), report 5430-BLP-R-006-02. Fuels and oils are not considered further within this assessment, the site is located within a low-sensitivity setting. Any spill can be readily contained / remediated without environmental risk / harm.
- Visible plumes are not considered further within this assessment, waste types proposed are not considered to cause a risk of fire (fire prevention in regard to site infrastructure / plant are part of Booth's EMS system).

Pathways that can link the above activity emissions to a receptor are defined as:

- Airborne – Odour, Dust, Litter, visible plumes, pests (flies)
- Infiltration through ground – Water Pollution
- Overland / surface passage – vermin

## 2.2 Proposed Operation

The proposal is to use Qualifying Materials fill, as specified by Her Majesty's Revenue and Customs (HMRC) in The Landfill Tax (Qualifying Material) Order 2011 (as amended)<sup>1</sup>, to landfill the resultant void space at Sandown Quarry. The landfill will be lined with an engineered mineral liner, capped with low permeability materials, and restored to direct surface run-off towards a pond located in the northwest corner of the site.

The landfilling will restore the land back to surrounding levels and it is anticipated that approximately 5% of the wastes imported will be suitable for processing (crushing and/or screening) utilising mobile plant.

The processing activity will be located within the base of the void during the operational life of the landfilling that will reduce significantly the effects of wind-blown emissions, indicative locations are presented on drawings ESID 4, ESID 5A and 5B. Initially, the activity will be ~40m below adjacent ground level in the eastern area of the void (ESID 4 and 5A) and will incrementally moved and re-positioned above the infill in a similar area / location up to year 6. At which point the processing activity will still remain at least 23m below adjacent ground level (these assumptions are approximations based on predicted volumes / tonnages and the outline phasing / infilling plans).

In the proposed locations depicted, it is anticipated that it will take ~15 years to reach ground level, at that point in time there will be a separation distance of ~60 to the Daw End canal to the east and ~505m to the Swan Pool SSSI to the west.

## 2.3 Potential Hazards

### 2.3.1 Odour

The wastes to be brought for disposal at the site are very unlikely to be a significant source of odour. Experience from similarly permitted landfills shows that the low or negligible organic content of the wastes results in negligible landfill gas generation and no production of malodorous leachate. The very limited range of wastes to be accepted effectively removes the need to produce an odour management plan. Nevertheless, the risks associated with fugitive odour emissions are detailed in Table 3 and will continue to be managed in accordance with the site's odour management plan (part of Booth's EMS system).

### 2.3.2 Noise and Vibration

The risk of excessive noise and vibration associated with the proposed activity will be restricted primarily to movement and operation of site plant and additionally the aggregate processing / screening operation. The site is located within a semi-urban / industrial location with residential land use to the northwest, southwest and east (beyond Leighswood Industrial Estate), and limited agricultural land use to the west. The site is an active quarry, with plant operating onsite and lorries

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<sup>1</sup> The Landfill Tax (Qualifying Material) Order 2011 (as amended) - <https://www.legislation.gov.uk/uksi/2011/1017/contents/made>



arriving and departing. It is therefore considered that the disposal/restoration operations at the site are unlikely to generate an increase in noise impact over those already observed.

The majority of the activity is below ground surface (within a quarry / void) hence noise is lessened compared to above ground surface operations, this includes the aggregate processing. A quantitative noise assessment has been undertaken to support the twin tracked Planning Application. Risks associated with noise and vibration are detailed in Table 4 and will be managed in accordance with the site's management plans (current EMS). Noise is likely to be controlled by the inclusion of noise limits and operational hours (if deemed appropriate by the local authority).

A qualitative appraisal will assess the aggregate screening in isolation based on the location of the proposal (i.e. within the base of the void) and as such, if potential cumulative effects require further assessment or inclusion of noise monitoring locations they will be agreed subject to mitigation agreed through the planning process. It is noted that the aggregate processing activity will be conducted on a "campaign basis" and hence is infrequent in operation, and of a short duration only.

### 2.3.3 Dust

The site is currently an operational mineral quarry, and the volume of dust created once it is a landfill is likely to be similar that currently produced within the quarry. Planning Practice Guidance (2014) is the principal document providing further guidance on the environmental impacts from mineral workings.

As such, dust control is likely to be referenced through the planning approval process to '*the Mineral Industry Research Organisation (MIRO) document 'Management mitigation and monitoring of nuisance dust and PM10 emissions arising from the extractive industries: an overview'* dated February 2011; the 'Institute of Air Quality Management Guidance on the Assessment of Impacts of Construction on Air Quality and the Determination of Their Significance' (2013); and London Councils/Mayor of London Best Practice Guidance for the 'Control of Dust and Emissions from Construction and Demolition' dated November 2006.

Dust is defined as all particulate matter up to 75µm in diameter (according to BS6069) and comprising both suspended and deposited dust in the London Councils/Mayor of London Best Practice Guidance. The deposition of the coarser dust fraction may be perceived as causing a nuisance. However, as described earlier there are no statutory limits above which deposited dust is considered a nuisance.

Dust generation, and dispersion are both dependent upon weather conditions. The most important factors are:

- precipitation, rain may suppress dust generation,
- wind direction, which determines direction of dispersion, and
- wind speed, which will affect ground level emissions by increasing the initial dilution of pollutants in the emission; it will also affect the potential for dust entrainment.

Dust generation is not expected to increase materially as the site changes from a working quarry to a landfill. As noted above, the aggregate processing activity is conducted on a "campaign basis" and hence is infrequent in operation, and of a short duration only. In this regard and based on its location (within the base / and then below ground levels until ~15years, it is considered unlikely that significant dust emissions will be generated from this activity in isolation. As noted above, weather conditions are the driver behind emissions, nevertheless the risks associated with dust emissions

are detailed in and will be managed in accordance with the dust management plan (Appendix A) which provides additional detail to complement the EMS system.

Although previous complaints had been received in relation to dust (industrial units to the southeast), a review and quantitative technical dust assessment was undertaken in December 2018 (Environmental Essential UK, December 2018) in line with legislation and guidance<sup>2,3,4</sup> to assess quarrying / processing effects. All results were below the guideline soiling rates of 2%EAC per day (Effective Area Coverage).

As the infilling is primarily below ground level, the landfilling at site will not significantly increase the risk of dust emissions. The risks associated with dust and mitigation controls are considered in 0 (see also Appendix A).

#### 2.3.4 Mud

Mud can be trailed onto the highway by vehicles leaving the site after picking up mud from unpaved roads or from the point of deposit. Access to the site will be via a newly constructed haul road and wheel wash. A combination of the distance travelled on the internal haul roads and the wheel wash will ensure any accumulated mud will be removed prior to the vehicle leaving site. If a vehicle is observed to be particularly muddy, the driver will be redirected through the wheelwash.

The primary receptor to entrained mud will be the adjoining Stubbers Green Road. The wheel wash will be maintained to ensure efficient operation and the haul roads will be maintained by road sweeper. The access roads and Stubbers Green Road will be regularly inspected allowing the operator to deploy additional road sweepers as necessary, as part of the landfill Site management controls. The risks associated with entrained mud are considered in 0.

#### 2.3.5 Litter

The waste types to be brought to site are Qualifying Materials, which will be primarily excavated mineral and aggregates. These are very unlikely to contain materials which could present a risk of wind-blown litter and will not be considered further by this assessment.

#### 2.3.6 Pests and Vermin

The deposit of putrescible waste in landfills may attract pests and scavengers and also provide a habitat for the breeding or loafing of pests and vermin. As the materials to be accepted for disposal are unlikely to contain anything to attract pests or vermin, the risk associated with the site is considered to be negligible and will not be considered further by this assessment.

#### 2.3.7 Global Warming

The Gas Risk Assessment (5430-BLP-R-007-02) has determined (qualitatively assessed) that negligible volumes of landfill gas will be generated by the deposited wastes. The volumes are significantly lower than the threshold at which conventional control and treatment systems can operate.

Gas monitoring carried out at similar sites indicates that the actual volume of gas produced will be lower than the surrender criteria detailed in the Environment Agency Surrender Guidance<sup>5</sup>. It is

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<sup>2</sup> Controlling and Mitigating the Environmental Effects of Minerals Extraction in England (MPS2)

<sup>3</sup> Environmental Protection Act 1990 (EPA) – Section 43, section 80

<sup>4</sup> Monitoring Particulate Matter in Ambient Air around Waste Facilities - Technical Guidance Note (Monitoring) M17

<sup>5</sup> [https://www.gov.uk/government/publications/landfill-epr-502-and-other-permanent-deposits-of-waste-how-to-surrender-your-environmental-permit/landfill-and-deposit-for-recovery-aftercare-and-permit-surrender#Landfill\\_gas\\_monitoring](https://www.gov.uk/government/publications/landfill-epr-502-and-other-permanent-deposits-of-waste-how-to-surrender-your-environmental-permit/landfill-and-deposit-for-recovery-aftercare-and-permit-surrender#Landfill_gas_monitoring)

therefore expected that the site will present a negligible risk in terms of global warming potential will not be considered further in this assessment.

## 2.4 Hazard Pathway

When identifying the receptors, the closest and the most sensitive (if different from the closest) have been considered in each direction from the hazard. Account has been taken of the mechanism of transport to the sensitive receptor e.g. proximity to highway access / egress points for mud and wind direction for airborne dust. Recent wind direction data has been used to establish 'Airborne' hazard pathways to adjacent / nearby receptors.

## 2.5 Probability of Exposure

Probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching the receptor i.e. frequency of prevailing wind in that direction. The probability of exposure is irrespective of the type of hazard presented.

## 2.6 Hazard Receptors

As stated in Section 2.1, an appraisal of site receptors has been undertaken, Table 1 identifies the most likely sensitive receptors adjacent to site, this has been compiled using information available through internet-based searches. The locations of these receptors are indicated on drawing ESID 2 and ESID 3.

A review of European Sites and local Sites (5430-BLP-R-003-02) has highlighted the presence of nearby ecological SSSI's. These sites have been considered accordingly in relevant risk assessments.

## 2.7 Risk Assessment

The specific risk assessments completed for Odour, Noise, Dust Fugitive Emissions and Mud are detailed in the tables below. In many cases there is an inter-relationship between these specific risk assessments and meteorological conditions and where relevant this has been identified.

The pathway is determined by the location of the receptor relative to the site, the distance from the site boundary (m) and the frequency (likelihood) the prevailing wind will blow in the direction of the receptor (%) as determined by wind rose data.

### 2.7.1 Mitigated Risk

The Mitigated Risk is the residual risk presented by the Hazard after control measures have been instigated.

### 2.7.2 Environmental Accidents

Environment Agency guidance requires the completion of an Accidents Risk Assessment and Management Plan. This should assess potential hazards associated with the proposed activity not described in the sections above. Potential environmental accidents attributed to gas, leachate and waste mass stability have been considered within separate risk assessments that form part of permit application. Accidents are considered in 0 herein for completeness.

### **3 Conclusions**

The operational hazards associated with the proposal have been considered in the tables below, these hazards relate to health and amenity.

It has been concluded that, where necessary, with the use of appropriate mitigating management controls (including careful siting of the aggregate processing operation) the installation will not present a significant risk to surrounding receptors.

By way of further mitigation, additional dust monitoring has been proposed (0) but only in the event of adverse weather conditions and when operations are within 5m of the perimeter land surface levels. Based on the industrial nature of the surrounding area, it is unlikely that any issued planning consent will require further mitigation against noise or dust effects.

Table 3 Odour Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
<b>Odour through the Air from:</b> fugitive landfill gas emissions, exposed waste and wastes as received as part of the infilling – <u>considered low risk based on proposed waste types</u>	1	20	SW	4	<b>Low</b> - Waste types very unlikely to generate odours	High – nuisance to residential receptor	Medium	Waste Acceptance Protocols ensure wastes have low organic content and therefore negligible gas / odour potential	<b>Low</b>
	2	125	NW	9		High – nuisance to residential receptor	Medium		
	3	130	W	1		High – nuisance to residential receptor	Medium		
	4	150	W	1		High – nuisance to residential receptor	Medium		
	5	180	W	1		High – nuisance to residential receptor	Medium		
	6	240	W	1		High – nuisance to residential receptor	Medium		
	7	210	NNW	22		High – nuisance to residential receptor	Medium		
	8	850	SE	4		High – school receptor, nuisance to students	Medium		
	9	1230	NNE	10		High – school receptor, nuisance to students	Medium		
	10	960	ESE	2		High – school receptor, nuisance to students	Medium		
	11	520	WNW	5		High – school receptor, nuisance to students	Medium		
	12	870	W	1		High – school receptor, nuisance to students	Medium		
	13	900	SW	4		High – school receptor, nuisance to students	Medium		
	14	670	N	14		Medium – transient nuisance to allotments user	Low		
	15	200	SW	4		Medium – recreation open space, nuisance to sailing club	Low		
	16	40	W	1		Medium – recreation open space, nuisance to user	Low		
	17	450	W	1		Medium – recreation open space, nuisance to user	Low		
	18	40	S	2		Low – industrial, no nuisance	Low		
	19	80	E	5		Low – Industrial, no nuisance	Low		
	20	15	N	14		Low – Industrial, no nuisance	Low		
	21	250	N	14		Low – landfill, no nuisance	Low		
	22	210	NNE	10		Low – landfill, no nuisance	Low		
	23	590	SSW	4		Low – Industrial, no nuisance	Low		
	24	280	SSE	0		Low – Industrial, no nuisance	Low		
	25	430	SSE	0		Low – Industrial, no nuisance	Low		
	26	410	S	2		Low – Industrial, no nuisance	Low		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	27	15	E	5		Low – not a nuisance to watercourse, nuisance to user	Low	appropriate remedial action if applicable.  In some instances the source may be shown to be off-site and thus beyond the control of the operator.	
	28	10	W	1		Low – open land, water, SSSI, not a nuisance	Low		
	29	75	W	1		Low – open land, water, SSSI, not a nuisance	Low		
	30	90	NNW	22		Low – open land, water, not a nuisance	Low		
	31	200	N	14		Low – open land, water, not a nuisance	Low		
	32	220	S	2		Low – open land, water, not a nuisance	Low		
	33	500	WSW	2		Low – open land, water, not a nuisance to watercourse	Low		
	34	210	SSE	0		Low – open land, water, not a nuisance to watercourse	Low		
	35	330	NE	7		Low – open land, water, not a nuisance to watercourse	Low		
	36	320	N	14		Low – landfill drainage, not a nuisance to watercourse	Low		
	37	5	W	1		Low – watercourse / ditch, not a nuisance to watercourse	Low		
	38	20	NW	9		Low – watercourse / ditch, not a nuisance to watercourse	Low		
	39	300	W	1		Low – watercourse / ditch, not a nuisance to watercourse	Low		
	40	200	NNW	22		Low – watercourse / ditch, not a nuisance to watercourse	Low		
	41	50	S	2		Low – watercourse / ditch, not a nuisance to watercourse	Low		
	42	0		1		Low – open land, water, SSSI, not a nuisance to habitats	Low		
	43	50	S	2		Low – open land, water, SSSI, not a nuisance to habitats	Low		
	44	340	N	14		Low – open land, water, SSSI, not a nuisance to habitats	Low		
	45	1250	SSW	4		Low – SSSI, not a nuisance to habitats	Low		
	46	220	SW	4		Low – local wildlife site, not a nuisance to habitats	Low		
	47	70	S	2		Low – local wildlife site, not a nuisance to habitats	Low		
	48	15	E	5		Low – local wildlife site, not a nuisance to habitats	Low		
	49	15	W	1		Low – local wildlife site, not a nuisance to habitats	Low		
	50	20	W	1		Low – road, not a nuisance to traffic, road users	Low		
	51	50	SW	4		Low – minor road, not a nuisance to traffic, road users	Low		
	52	20	ENE	8		Low – minor road / access, not a nuisance to traffic, road	Low		
	53	140	E	5		Low – minor road, not a nuisance to traffic, road users	Low		

**Table 4 Noise and Vibration Risk Assessment and Management Plan**

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk	
	No.	Dist.	Direc.	Freq.						
<p><b>Noise through air and Vibration through ground from:</b></p> <p>Vehicle Movements associated with the delivering and handling of waste on site.</p> <p>Site plant.</p> <p>Aggregate Processing - (screening &amp; crushing)</p>	1	20	SW	4	High	High – nuisance to residents	High	<p>Site activities will be below ground level for the majority of the site life. Landfilling activities are unlikely to generate noise in excess of the previous quarrying activities.</p>	<b>Low</b>	
	2	125	NW	9	Medium	Medium – nuisance to residents	Medium			
	3	130	W	1	Medium	Medium – nuisance to residents but low prevailing wind	Medium			<p>Noise screens are to be considered (adjacent to nearest property) when operations are within 5m of ground level – only in the event of previous complaints and or requirement of any planning approval mitigation.</p>
	4	150	W	1	Medium	High – nuisance to residents but low prevailing wind	Medium			
	5	180	W	1	Medium	High – nuisance to residents but low prevailing wind	Medium			
	6	240	W	1	Medium	High – nuisance to residents but low prevailing wind	Medium			
	7	210	NNW	22	Medium	High – nuisance to residents	Medium			
	8	850	SE	4	Medium	Medium – nuisance to students but low prevailing wind	Medium			
	9	1230	NNE	10	Low	Medium – nuisance to students	Low			
	10	960	ESE	2	Low	Medium – nuisance to students but low prevailing wind	Low			
	11	520	WNW	5	Medium	Medium – nuisance to students but low prevailing wind	Low			
	12	870	W	1	Medium	Medium – nuisance to students but low prevailing wind	Low	<p>On site speed limits will be enforced and internal site roads will be maintained to minimise noise / vibration.</p> <p>Appropriate maintenance of site vehicles in accordance with the manufacturer’s or supplier’s instructions</p>		
	13	900	SW	4	Medium	Medium – nuisance to students but low prevailing wind	Low			
	14	670	N	14	Low	Medium – nuisance to users to open spaces	Low			
	15	200	SW	4	Medium	Medium – nuisance to users to open spaces	Low			
	16	40	W	1	High	Medium – nuisance to users to open spaces	Low			
	17	450	W	1	Low	Medium – nuisance to users to open spaces	Low			
	18	40	S	2	High	Low – limited effect to industrial facilities	Low			
	19	80	E	5	Medium	Low – limited effect to industrial facilities	Low			
	20	15	N	14	High	Low – limited effect to industrial facilities	Low			
	21	250	N	14	Medium	Low – limited effect to industrial facilities	Low			
	22	210	NNE	10	Medium	Low – limited effect to industrial facilities	Low			
	23	590	SSW	4	Medium	Low – limited effect to industrial facilities	Low			
	24	280	SSE	0	Medium	Low – limited effect to industrial facilities	Low			
	25	430	SSE	0	Medium	Low – limited effect to industrial facilities	Low			

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	26	410	S	2	Medium	Low – limited effect to industrial facilities	Low	Where practicable, engines to be switched off when not in use.  Silencers will be used on vehicles. Should it prove necessary alternatives to reversing beepers on site vehicles will also be considered.  Tipping will not be made from height to reduce noise / vibration.  Planning conditions which set noise limits for the operations (if required) if set the limits will be adhered to at all times.	
	27	15	E	5	High	Low – open land, water course, transient noise	Low		
	28	10	W	1	High	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	29	75	W	1	High	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	30	90	NNW	22	Medium	Medium – open land, pond, transient noise annoyance	Low		
	31	200	N	14	Medium	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	32	220	S	2	Medium	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	33	500	WSW	2	Medium	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	34	210	SSE	0	Medium	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	35	330	NE	7	Medium	Low – open land, water, transient noise annoyance, low prevailing wind frequency	Low		
	36	320	N	14	Medium	Low – landfill site drainage	Low		
	37	5	W	1	Medium	Low – water drainage	Low		
	38	20	NW	9	Medium	Low – water drainage	Low		
	39	300	W	1	Medium	Low – water drainage	Low		
	40	200	NNW	22	Medium	Low – water drainage	Low		
	41	50	S	2	Medium	Low – water drainage	Low		
	42	0	W	1	High	Low – open land, SSSI, transient noise annoyance, prevailing wind frequency	Medium	Processing / screening operations are operated on a campaign basis to limit both	
	43	50	S	2	High	Low – open land, SSSI, transient noise annoyance, low prevailing wind frequency	Medium		



Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	44	340	N	14	Medium	Low – open land, SSSI, transient noise annoyance	Medium	duration and significance of any effects.	
	45	1250	SSW	4	Low	Low – open land, SSSI, low prevailing wind frequency	Medium		
	46	220	SW	4	Medium	Low – open land LWS, transient noise annoyance, low prevailing wind frequency	Medium		
	47	70	S	2	Medium	Low – open land LWS, transient noise annoyance, low prevailing wind frequency	Medium		
	48	15	E	5	High	Low – open land, water course, transient noise	Low		
	49	15	W	1	High	Low – open land LWS, transient noise annoyance, low prevailing wind frequency	Medium		
	50	20	W	1	High	Low – road, low prevailing wind frequency	Low		
	51	50	SW	4	High	Low – road, low prevailing wind frequency	Low		
	52	20	ENE	8	High	Low – road, low prevailing wind frequency	Low		
	53	140	E	5	Medium	Low – road, low prevailing wind frequency	Low		

Table 5 Dust Fugitive Emission Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
Dust through air from: vehicle movements or deposit of wastes Aggregate Processing - (screening & crushing)	1	20	SW	4	High - distance from site	High - residential receptor, low prevailing wind frequency	Medium	<p>No excessively dusty wastes to be accepted at the site. <u>(Infilling is predominantly below ground surface.) which further mitigates against emissions</u></p> <p>On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust.</p> <p>Dampening of site roads/surfaces as necessary using a tanker during dry periods.</p> <p>Weighbridge will conduct assessment of waste inputs and impose controls and restriction on potentially dusty waste (e.g. rapid cover following placement, refusal to tip).</p> <p>Daily visual inspection by appropriate site staff at</p>	<b>Low</b>
	2	125	NW	9	High - proximity to site	High - residential receptor	Medium		
	3	130	W	1	High - proximity to site	High - residential receptor, low prevailing wind frequency	Medium		
	4	150	W	1	High - proximity to site	High - residential receptor, low prevailing wind frequency	Medium		
	5	180	W	1	High - proximity to site	High - residential receptor, low prevailing wind frequency	Medium		
	6	240	W	1	Medium - distance from site	High - residential receptor, low prevailing wind frequency	Medium		
	7	210	NNW	22	Medium - distance from site	High - residential receptor	Medium		
	8	850	SE	4	Medium - distance from site	High - school, low prevailing wind frequency	Medium		
	9	1230	NNE	10	Medium - distance from site	High - school receptor	Medium		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	10	960	ESE	2	Medium – distance from site	High – school receptor, low prevailing wind frequency	Medium	<p>suitable locations taking account of the prevailing wind direction.</p> <p><u>Twice daily visual inspection recommended in adverse weather conditions at the Site.</u></p> <p>All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance.</p> <p>A street sweeper will regularly clean site roads of any mud trailed on from site vehicles, this will limit further dust generation.</p> <p>Processing / screening operations are operated on a campaign basis to limit both duration and significance of any effects. Additional visual observations / checking during the activity to ensure no significant dust generated from the process – operation to be halted if excessively</p>	
	11	520	WNW	5	Medium – distance from site	High – school receptor, low prevailing wind frequency	Medium		
	12	870	W	1	Medium – distance from site	High – school receptor, low prevailing wind frequency	Medium		
	13	900	SW	4	Medium - proximity to site	Low – school receptor, low prevailing wind frequency	Low		
	14	670	N	14	Medium – distance from site	Low – open space, transient odour annoyance	Low		
	15	200	SW	4	Medium – distance from site	Low – open space, low prevailing wind frequency	Low		
	16	40	W	1	High - distance from site	Low – open land, low prevailing wind frequency	Low		
	17	450	W	1	Low - distance from site	Low – open land, low prevailing wind frequency	Low		
	18	40	S	2	High - distance from site	Low – industrial facility, low prevailing wind frequency	Low		
	19	80	E	5	High - distance from site	Low – industrial facility, low prevailing wind frequency	Low		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	20	15	N	14	High - distance from site	Low – industrial facility, landfill	Low	windy and rescheduled to be undertaken when conditions are more favourable. Perimeter checks (particularly at the Daw End canal and Swan Pool SSSI during operation are encouraged).	
	21	250	N	14	Medium - distance from site	Low – industrial facility, landfill	Low		
	22	210	NNE	10	Medium - distance from site	Low – industrial facility, landfill	Low		
	23	590	SSW	4	Medium - distance from site	Low – industrial facility, low prevailing wind frequency	Low		
	24	280	SSE	0	Medium - distance from site	Low – industrial facility, low prevailing wind frequency	Low		
	25	430	SSE	0	Medium - distance from site	Low – industrial facility, low prevailing wind frequency	Low		
	26	410	S	2	Medium - distance from site	Low – industrial facility, low prevailing wind frequency	Low		
	27	15	E	5	High - distance from site	Low – open land, water, low prevailing wind frequency	Low		
	28	10	W	1	High - distance from site	Low – open land, water, low prevailing wind frequency	Low		
	29	75	W	1	High - distance from site	Low – open land, water, low prevailing wind frequency	Low		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	30	90	NNW	22	High - distance from site	Low – open land, water	Low		
	31	200	N	14	Medium - distance from site	Low – open land, water	Low		
	32	220	S	2	Medium - distance from site	Low – open land, water	Low		
	33	500	WSW	2	Medium - distance from site	Low – open land, water	Low		
	34	210	SSE	0	Medium - distance from site	Low – open land, water	Low		
	35	330	NE	7	Medium - distance from site	Low – open land, water	Low		
	36	320	N	14	Medium – distance from site	Low – landfill site drainage	Low		
	37	5	W	1	High – distance from site	Low – drainage / ditch, low prevailing wind frequency	Low		
	38	20	NW	9	High – distance from site	Low – drainage / ditch	Low		
	39	300	W	1	Medium – distance from site	Low – drainage / ditch, low prevailing wind frequency	Low		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	40	200	NNW	22	Medium - distance from site	Low - drainage / ditch	Low		
	41	50	S	2	High - distance from site	Low - drainage / ditch, low wind frequency	Low		
	42	0	W	1	High - distance from site	Low - open land SSSI, water, low prevailing wind frequency	Low		
	43	50	S	2	High - distance from site	Low - open land SSSI, water, low prevailing wind frequency	Low		
	44	340	N	14	Medium - distance from site	Low - open land SSSI	Low		
	45	1250	SSW	4	Low - distance from site	Low - open land, low prevailing wind frequency	Low		
	46	220	SW	4	Medium - distance from site	Low - open land LWS, low prevailing wind frequency	Low		
	47	70	S	2	High - distance from site	Low - open land LWS, low prevailing wind frequency	Low		
	48	15	E	5	High - distance from site	Low - open land LWS, low prevailing wind frequency	Low		
	49	15	W	1	High - distance from site	Low - open land LWS, low prevailing wind frequency	Low		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	50	20	W	1	High - distance from site	Low - road, low prevailing wind frequency	Low		
	51	50	SW	4	High - distance from site	Low - road, low prevailing wind frequency	Low		
	52	20	ENE	8	High - distance from site	Low - road	Low		
	53	140	E	5	Medium - distance from site	Low - road, low prevailing wind frequency	Low		

**Table 6 Mud Fugitive Emission Risk Assessment and Management Plan**

Hazard and Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Overall Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
Mud tracked from site onto public roads by associated site vehicles	1	20	SW	4	High	High – risk to resident using Stubbers Green Road	High	All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance.	Low
	2	125	NW	9	High	Medium – potential to use Stubbers Green Road	High		
	3	130	W	1	High	Medium – potential to use Stubbers Green Road	High		
	4	150	W	1	High	Medium – potential to use Stubbers Green Road	High		
	5	180	W	1	High	Medium – potential to use Stubbers Green Road	High		
	6	240	W	1	High	Medium – potential to use Stubbers Green Road	High		
	7	210	NNW	22	High	Medium – potential to use Stubbers Green Road	High		
	8	850	SE	4	Medium	Low – potential to use Stubbers Green Road for travel	Medium	Site staff at the weighbridge and at the tipping face will be vigilant to excessive mud tracked from the site by visiting HGV’s and site plant. Any vehicles observed to be carrying mud in their tyres will be directed back through the wheelwash until the wheels are clean before leaving site.	
	9	1230	NNE	10	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	10	960	ESE	2	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	11	520	WNW	5	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	12	870	W	1	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	13	900	SW	4	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	14	670	N	14	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	15	200	SW	4	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	16	40	W	1	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	17	450	W	1	Medium	Low – potential to use Stubbers Green Road for travel	Medium		
	18	40	S	2	Medium	Low – potential to use road for journey to work	Medium	A street sweeper will regularly clean the site haul roads and the adjacent shared access and public highway as necessary.	
	19	80	E	5	Medium	Low – potential to use road for journey to work	Medium		
	20	15	N	14	Medium	Low – potential to use road for journey to work	Medium		
	21	250	N	14	Medium	Low – potential to use road for journey to work	Medium		
	22	210	NNE	10	Medium	Low – potential to use road for journey to work	Medium		
	23	590	SSW	4	Medium	Low – potential to use road for journey to work	Medium		
	24	280	SSE	0	Medium	Low – potential to use road for journey to work	Medium	Drivers will be reminded of their responsibility to maintain	
	25	430	SSE	0	Medium	Low – potential to use road for journey to work	Medium		



Hazard and Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Overall Risk	Risk Management	Mitigated Risk
	No.	Dist.	Dirac.	Freq.					
	26	410	S	2	Medium	Low – potential to use road for journey to work	Medium	clean vehicles and not to track mud onto the public highway.  Monitoring of access and appropriate maintenance will form part of the EMS for the site.	
	27	15	E	5	Low	Water feature not at risk from mud entrainment on road	Low		
	28	10	W	1	Low	Water feature not at risk from mud entrainment on road	Low		
	29	75	W	1	Low	Water feature not at risk from mud entrainment on road	Low		
	30	90	NNW	22	Low	Water feature not at risk from mud entrainment on road	Low		
	31	200	N	14	Low	Water feature not at risk from mud entrainment on road	Low		
	32	220	S	2	Low	Water feature not at risk from mud entrainment on road	Low		
	33	500	WSW	2	Low	Water feature not at risk from mud entrainment on road	Low		
	34	210	SSE	0	Low	Water feature not at risk from mud entrainment on road	Low		
	35	330	NE	7	Low	Water feature not at risk from mud entrainment on road	Low		
	36	320	N	14	Low	Water feature not at risk from mud entrainment on road	Low		
	37	5	W	1	Low	Water feature not at risk from mud entrainment on road	Low		
	38	20	NW	9	Low	Water feature not at risk from mud entrainment on road	Low		
	39	300	W	1	Low	Water feature not at risk from mud entrainment on road	Low		
	40	200	NNW	22	Low	Water feature not at risk from mud entrainment on road	Low		
	41	50	S	2	Low	Water feature not at risk from mud entrainment on road	Low		
	42	0	W	1	Low	SSSI not at risk from mud entrainment on road	Low		
	43	50	S	2	Low	SSSI not at risk from mud entrainment on road	Low		
	44	340	N	14	Low	SSSI not at risk from mud entrainment on road	Low		
	45	1250	SSW	4	Low	SSSI not at risk from mud entrainment on road	Low		
	46	220	SW	4	Low	LWS not at risk from mud entrainment on road	Low		
	47	70	S	2	Low	LWS not at risk from mud entrainment on road	Low		
	48	15	E	5	Low	LWS not at risk from mud entrainment on road	Low		
	49	15	W	1	Low	LWS not at risk from mud entrainment on road	Low		
	50	20	W	1	High	Medium – potential to use Stubbers Green Road	High		
	51	50	SW	4	Medium	Medium – potential to use Stubbers Green Road	High		
	52	20	ENE	8	Medium	Medium – potential to use Stubbers Green Road	High		

Hazard and Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Overall Risk	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
	53	140	E	5	Medium	Medium – potential to use Stubbers Green Road	High		

**Table 7** Accident Management Plan

Hazard	Receptor	Pathway	Probability	Unmitigated Consequence	Overall Risk	Risk Management	Mitigated Risk
<b>Fuel / engine oil</b> Leak or damage to portable fuel bowser, static fuel storage tank or site vehicles	Groundwater	Base of excavation	Low	Low - pollution of groundwater (low sensitivity)	Medium	Fuel and engine oils stored away from proposed installation with appropriate secondary containment and spillage contingencies;	<b>Low</b>
	Surface Water	Lateral	Low	High - pollution of surface water	Medium	Site vehicles will not be refuelled within installation area; Site vehicles and plant subject to regular preventative maintenance in accordance with EMS procedures.	
<b>Fire</b> Uncontrolled burning of residual wastes or site vehicles.	Groundwater	Base of excavation	Low	Low - pollution of groundwater through firewater run-off or leaks from damaged equipment (low sensitivity)	Medium	Wastes to be accepted at site will effectively be non-hazardous (effectively inert), have a low organic content and inherently non-combustible in nature, or through production of landfill gas;  Site vehicles and plant subject to regular preventative maintenance in line with site EMS procedures;	<b>Low</b>
	Receptors listed in Table 1 above	Airborne	Low	Medium - smoke / odour annoyance	Medium	Fire control equipment will be on hand, with major incidents to be dealt with by the Fire Brigade in accordance with site EMS Procedures.	
<b>Explosion</b> Compressed gas cylinders, combustion of landfill gas or fuel storage tank	Site staff	Airborne	Low	High - danger of serious injury	Medium	Fuel is stored in separate installation with appropriate controls to prevent fire or explosion (i.e. no smoking on site);	<b>Low</b>
	Groundwater	Base of excavation	Low	High - pollution of groundwater through leaks from damaged equipment	Medium	Compressed gases not required and therefore present for operation of installation.  Low organic content of waste will generate negligible volumes of landfill gas and will not present an explosion risk.	

<b>Wastes deposited</b> Chemical reaction of incompatible wastes	Receptors listed in Table 1 above	Airborne	Low	Medium - odour annoyance or smoke from oxidising agents	Medium	Waste acceptance protocols will exclude the deposit of chemically reactive wastes. Those accepted will be of an inert/non-hazardous nature and will not generate noxious gases or contaminating leachate.	<b>Low</b>
<b>Vandalism</b> Damage to site vehicles, fuel bowsers, gas or leachate extraction pipework (if relevant)	Groundwater	Base of excavation	Low	Low - pollution of groundwater through leaks from damaged equipment (low sensitivity)	Medium	Site security will prevent access by unauthorised persons. Vehicles will be kept overnight in a secure area with appropriate security measures;  Wastes not expected to require exposed active gas or leachate control infrastructure which could be subject to damage.	<b>Low</b>
	Receptors listed in Table 1 above	Airborne	Low	Medium - odour annoyance	Medium		
<b>Leachate</b> Accidental damage to leachate monitoring chamber	Groundwater	Base of excavation	Low	Low - pollution of groundwater through leaks from damaged well (low sensitivity)	Medium	Wastes not expected to require active gas or leachate control infrastructure which could be exposed to damage;  CQA supervision will prevent damage to basal drainage pipework (spine drains) with the deposit of waste.	<b>Low</b>

# Appendix A - Nature and Heritage Conservation Screening Report

**Appendix B - Dust Management Plan**

IRELAND | UK | UAE | BAHRAIN | KSA

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