ENVIROARM LTD

Carried out for: CHADWICH LANE QUARRY LTD

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1.0 Introduction

Enviroarm Limited has been instructed by Chadwich Lane Quarry Ltd to prepare an Environmental Permit Application for the Chadwich Lane Quarry Landfill under the Environmental Permitting (EP) (England and Wales) Regulations 2016 for inert waste landfill.

1.1 Methodology

This Environmental Risk Assessment (ERA) is an assessment of the risks to the environment and to human health that may be associated with the proposed operations at the site.

The assessment has been completed in accordance with the Environment Agency (EA) Technical Guidance *'Risk Assessments for your Environment Permit'* [1]. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

This ERA uses the following approach for identifying and assessing the risks from the proposed operation:

Step 1 Identify risks and sources of risk from your activity.

Step 2 Where risks are identified from Step 1 then identify the receptors that could be affected

Step 3 Identify potential pathways between the sources of risk and receptors

Step 4 Assess the risks and check that they are acceptable. Justify appropriate measures to control your risks, if necessary.

Step 5 Submit your assessment.

The ERA for an EP application requires all receptors that are near the site and could reasonably be affected by the activities to be identified and considered as part of the assessment.

For the purposes of this ERA and given the nature of the landfill and associated WTS, a 2km radius from the site's EP boundary has been adopted in reviewing potentially sensitive receptors of ecological importance along with features such as sites of cultural and natural heritage. A radius of 1km from the site's EP boundary has been adopted for all other potentially sensitive receptors (for example, residential, commercial, industrial, agricultural and surface water receptors).

Section 2.0 of this document is a screening step to identify the risks requiring consideration as part of this assessment. Section 3.0 identifies people or parts of the environment that could be harmed (at potentially significant risk) by the activity. Section 4.0 of this document presents the assessment and demonstrates that any risks of pollution or harm will be mitigated to manage the risk.

This ERA should be read in conjunction with the following documents submitted with this EP application;

- Environmental Setting and Site Design Report (ESSD);
- Noise Assessment Report;
- Dust Assessment Report
- Waste Acceptance Procedure (WAP);

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit,

2.0 Identifying the Risks

Step 1 is a screening step to identify the potential risks to the environment from the development. The following are generally considered to require assessment for bespoke operations:

- Amenity and Accidents;
- Site Waste;
- Global Warming Potential;
- Noise,
- Fugitive Emissions to Air, Water and Land; and
- Accidents.

As a result of this EP application, the amenity and accidents, noise and fugitive emissions have been assessed based on the proposed activities included within Section 4 of this ERA.

3.0 Site Setting and Receptors

3.1 Site Setting

The site is south-western fringe of Birmingham at National Grid reference SO 395448 276819 is the centre of the site and the site entrance is SO 396373 276818 see Figure 1 and Drawing ESID 1.

The Site comprises 10.5 hectares of agricultural land located near Bromsgrove, Worcestershire. The Site includes a rectangular area which immediately abuts the former Chadwich Lane Quarry together with a linear strip of land to the south-east of the quarry.

The site is a quarry. The site is surrounded with large areas of agricultural land.

The remaining land use immediately surrounding the proposed site is predominately agricultural land, with scattered residential. Access to the site will be via Money Lane, Madeley Heath, Worcestershire. The site's location is illustrated on Drawing ESSD2, and the site layout on the Boundary Plan.

All surrounding land uses and receptors within 1km are identified on Drawing ESSD2 and all cultural and natural heritage is illustrated on Drawing ESSD3.

The immediate surrounding land uses are described in further detail below.

Table 3.1: Receptor List identified on ESSD 2.

Type of Receptor	**Receptor Name**	**Location to site**	**Elevation m AOD**
Domestic Dwelling Receptor	**DR1**	Group of houses located 575 metres north of the permit boundary.	179m AOD
Domestic Dwelling Receptor	**DR2**	Group of houses 540 metres north-west of the site.	171m AOD
Domestic Dwelling Receptor	**DR3**	Group of houses 340m north of the site	179m AOD
Domestic **Dwelling Receptor**	**DR4**	Group of houses 390m north of site	183m AOD
Domestic Dwelling Receptor	**DR5**	Group of houses 345m from site	167m AOD
Domestic Dwelling Receptor	**DR6**	Group of houses located 165m north west of site	167m AOD

Domestic Dwelling Receptor	**DR7**	Farm located 295 metre north -east of site.	190m AOD
Domestic Dwelling Receptor	**DR8**	Group of houses located 490m west of site.	152m AOD
Domestic Dwelling Receptor	**DR9**	Group of houses located 265 metres from site.	170m AOD
Domestic Dwelling Receptor	**DR10**	Houses directly to west of site 25 metres	170m AOD
Domestic Dwelling Receptor	**DR11**	House of side of site 2 m	175m AOD
Domestic Dwelling Receptor	**DR12**	House 335m south of site	335m AOD
Domestic Dwelling Receptor	**DR13**	Houses to south of site 520m	160m AOD
Domestic Dwelling Receptor	**DR14**	Houses to south of site 550m	160m AOD
Surface Water Receptor	**SW1**	A pool to west of site	100m AOD
Surface Water Receptor	**SW2**	A pool east of the site.	320m AOD
Surface Water Receptor	**SW3**	A pool to south of site	180m AOD
Surface Water Receptor	**SW4**	Pond to south Sandy Lane landfill site	570m AOD
Major roads and highways	**H1**	Heath End Road	171m AOD
Major roads and highways	**H2**	Quantry Lane	182m AOD
Major roads and highways	**H3**	Chapel Lane	160m AOD
Major roads and highways	**H4**	Bonfire Hill	172m AOD
Major roads and highways	**H5**	The Gutter	198m AOD
Major roads and highways	**H6**	Chadwich Lane	172m AOD
Major roads and highways	**H7**	Harbour Hill	180m AOD
Major roads and highways	**H8**	Sandy Lane,A491	160m AOD
Commercial Activity	**IR1**	Industrial operations at Chadwich Lane Farm.	155m AOD

Commercial Activity	**IR2**	Works to the east of Sandy Lane site	160m AOD
Closed historic landfills	**CL1**	Chadwich Lane landfill site now under restoration	187 -215m AOD
Closed historic landfill	**CL2**	Sandy Lane landfill site	160-180m AOD
Chadwch Lane Landfill	**PH1**	+	
Sandy Lane Landfill	**PH2**		

3.2 Geology

The Chadwich Lane Quarry is located in sands of the Wildmoor Sandstone. The quarry consists of a uniform, brownish red sandstone. The sandstone is medium too coarse grained, micaceous and feldspathic. Cross bedding has been observed which suggests fluvial deposition.

The strata dips south easterly. The local strata dips at approximately 7º.

The solid geological map is presented at Drawing ESSD 8

3.3 Hydrogeology

3.3.1 Aquifer Characteristics

The site is located on a bedrock Principal aquifer with rock deposits having high intergranular permeability, and providing a high level of water storage. They may support water supply and or river base flow on a strategic scale. Areas of secondary A aquifer (supporting water supplies (locally) are located up hydraulic gradient north east of the site and a Secondary B aquifer (predominantly lower permeability with limited storage and flow is located to the south west as the Mercia Mudstone Group.

[4]
The site is located within a Total Protection Zone (Zone 3). The nearest outer SPZ (SPZII) is located circa 1500m to the south of the permit boundary and the abstraction borehole is 1680metres from the site as shown in Figure 13.

Aquifer Properties

A shallow groundwater gradient of 0.0143m/m has been calculated from the available groundwater elevations, with the prevailing groundwater flow direction to the south. Groundwater elevations and interpolated potentiometric surface plots are presented on Drawing ESSD 11.

BGS data for the Wildmoor borehole ranges from 5.037 x 10^{-7}m/s to 2.8 x 10^{-6}m/s, presented at Appendix ESSD1. It is noted that the 400-day travel time range would be approximately 1m/d or 1.15 x10^{-5}m/s using a conservative assessment. Appendix ESSD 4 contains original packer tests carried out at Chadwich Lane which shows permeability values of 2.02 x 10^{-6}m/s to 8.8 x10^{-6}m/s.

The regional supplies come from the Sherwood Sandstone in the Trias. The water resources are administered by Severn Trent Water. In the Trias, the Chester Formation, and all sub units form a single aquifer, although it may contain aquicludes.

Source Protection Zones

The site does not lie within a Source Protection Zone (SPZ), see ESSD9.

4.1 Hydrology

The site lies within the catchment area of the River Severn. The nearest water course to the site is a brook to the north of the site.

4.2 Ecology

The following information has been assessed in order to determine the ecological site setting:

- MAGIC Mapping Website[6];
- SSSI

Based on the results of this investigation, and incorporating previous observations at the site, the likely position of the glacial channel at Madeley Heath can be estimated, though locational uncertainties and the overall lack of detailed stratigraphic information for the site prevent a precise reconstruction.

The channel is aligned NW-SE from Madeley Heath Farm Pit to Money Lane Pit, as first suggested by Barton (1960). It is at least 20m deep and is infilled with bedded sands overlain by coarse gravels and is at least 90m in width (Barton, 1960). The sediments infilling this channel were also present along the eastern side of Chadwich Lane Quarry (locations a-c of Maddy, 1989).

The south western margin of the deep channel feature may be located in the vicinity of the western edge of Money Lane Pit and to the east of Section 1 (Figure 1). Maddy's (1989) locations d and e are also considered to be outside the deep channel feature. South west of this line, a rather different suite of Pleistocene sediments is present though to not as great a depth comprising sands and gravels, reddish brown diamicton and greyish brown diamicton.

At the present time it remains unclear how these deposits relate to the channel feature and its infill of sands and coarse gravels. If the estimate of the elevation and thickness of the sediments in Money Lane Pit is correct, the deposits to the south west of the channel do not reach the same depth as those in the channel, as Triassic bedrock was observed at 198-194m OD beneath these deposits, while it may be below c.180m in the channel itself.

The north eastern margin of the deep glacial channel may lie approximately along the north eastern edge of Money Lane Pit, based on the observation by Barton that both sides of the channel were visible at Money Lane Pit, though only low confidence can be attached to this interpretation as very little data is available and the GPR survey was inconclusive.

The potential impact of the haul road on the Pleistocene deposits at the site, in particular the channel feature and the infilling sands and gravels for which the SSSI has been designated, can be assessed with regard to the likely position of the channel which has been determined on the basis of this investigation and previous information from the site.

The route of the proposed haul road which links the new extraction area west of Chadwich Lane Quarry to the highway at Money Lane (Figure 1) is divided into five sections. Each section is evaluated in terms of whether it is within, outside or traverses the margin of the channel feature and the likely impact of the haul road on

the underlying deposits (Table 3). The proposed haul road will run on the present ground surface, following stripping and storage of soils. Section D-E has been identified as a possible location for a permanent geological exposure which would require deeper excavation into the deposits.

Based on the available data, the haul road is unlikely to impact on the channel feature and its associated deposits as, for the most part, the route lies outside the probable margins of the channel feature. Section B-C does intersect the projected alignment of the channel, though at a lower elevation and some distance away from the designated SSSI. Section D-E, which runs adjacent to the southern boundary of the SSSI, is underlain by Pleistocene deposits (as exposed in TP 16/1), however these deposits are not thought to be part of the infill of the channel feature.

Section D-E of the haul road was identified as a possible location of a permanent geological exposure. As the channel feature is not present in this area and the deposits are not representative of the infill the channel feature, creating a geological exposure in this area would be of limited value. Moreover, the difficulties of maintaining an open section in unconsolidated Pleistocene sediments would make such an exercise impractical.

The designated SSSI, which falls largely within the boundary of the Chadwich Lane Quarry, has been impacted by mineral extraction, backfilling and restoration. The small triangular area on the southern boundary of the SSSI, an area of some 0.1 ha (c. 4% of the total area of the SSSI) lies outside any of the previous extraction areas and is underlain by intact Pleistocene deposits. However, the deposits in this area, which are typified by TP16/3 and section 1, are not those associated with the channel feature). While this portion of the SSSI does provide a useful intact remnant of the Pleistocene deposits at the site it does not include the main interest for which the site was designated. This area will not be impacted by the haul road and is currently occupied by a small area of woodland.

4.2.1 European/International Sites

An ecological screening was not requested from the Environment Agency. The site is not designated a Local Wildlife Site, devoid of trees and grass except for the boundary which is to remain unchanged and is not within a RAMSAR, SAC or SPA.

4.3 Cultural and Heritage

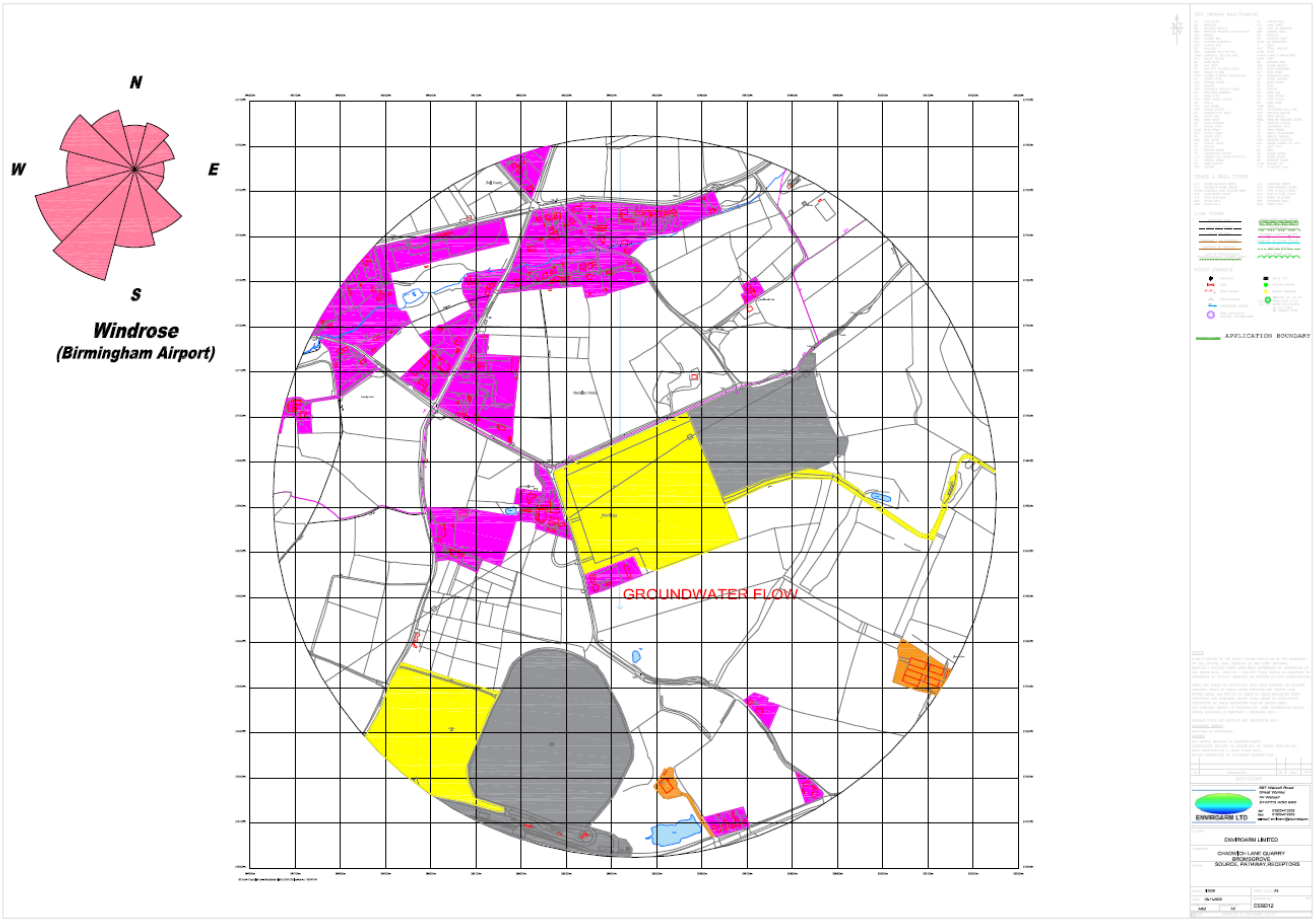
Information provided by EA indicates numerous Listed Buildings within 2km of the site. The closest of each to the site is shown below:

- Fairfield Court 1.0km south west

4.4 Windrose

The windrose shows that winds from the south west and west south western quarters are more frequent and winds.

Figure 4-1
Birmingham Meteorological Station



4.0 Environmental Risk Assessment

The following tables in this section assess the site in terms of potential hazards posed, receptors and pathways, along with management and assessment of the identified risks.

The probability of exposure is the likelihood of the receptors being exposed to the hazard, and is defined as low, medium or high. These terms are qualified as follows;

- Low: exposure is unlikely, barriers in place to mitigate against exposure.
- Medium: exposure is fairly probable, barriers to exposure less controllable.
- High: exposure is probable, direct exposure likely with few barriers.

The methodology outlined in Section 1.1 of this report is the basis on which it is determined whether the proposed operations will lead to significant impacts on the surrounding environment. Where a conclusion of 'not significant' has been reached, it is proposed that the mitigation and management measures that will be in place at the site will be sufficient to ensure that there will be no impact at the surrounding environment.

Air Quality monitoring with respect to NO2, PM10 and PM2.5 exposures are determined as negligible at all identified receptors.

Dust mitigation is required as part of the operations for the quarry and landfill. A dust scheme is in place at the site.

5.0 Conclusion

This ERA has been undertaken as described by regulatory guidance issued by the EA[1]. The assessment is provided as part of the application for an environmental permit application for the Chadwich Lane Quarry Inert Landfill.

This qualitative risk assessment has considered odour, noise, fugitive emissions, dust, releases to water, litter, and potential for accidents and incidents. The assessment concludes that with the implementation of the risk management measures described above, potential hazards from the proposed development are not likely to be significant and no further assessment is required. An DMP has been prepared in support of this ERA.

APPENDIX A:

ERA Risk Assessment

CHADWICH LANE **ODOUR** **DRAWING ESSD 2 AND ESSD12**

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**Risk Assesment**	**Risk Management**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Local human population	The site will take inert wastes. Therefore no issues considered with odour	Nuisance, loss of amenity	Air transport then inhalation.	High	Very low	**Low**	Permitted waste types are inert. The Landfill Gas Risk Assessment has concluded that there is little to no potential for significant gases to be generated at the site. This and the nature of the waste will mean that odour control and masking is not considered a requirement. Local residents are often sensitive to odours, however the wastes will not relase odour.The nearest identified receptor is within 10 metres of the landfill boundary, however this is generally upwind with isolated receptors	Emissions shall be free or virtually free from odour. Site has no requirement for gas flares or gas engines.	Very low
Protected sites - European sites and SSSIs	The site will take inert wastes. Therefore no issues considered with odour from ancient woodland	Nuisance, loss of amenity	Air transport then inhalation.	High	Very low	**Low**	Waste operations will not cause harm to and deterioration of nature conservation sites. Odour risk is considered negligible due to low production of gas set in Landfill Gas Risk Assessment ansd low organic matter content of waste.Nearest protected site is to west	Emissions shall be free or virtually free from odour.	Very Low

CHADWICH LANE **FUGITIVE EMISSIONS** **DRAWING ESSD 2 AND ESSD12**

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Risk Assesment**	**Risk Management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Local human population	Releases of particulate matter (dusts) from inert landfill	Harm to human health - respiratory irritation and illness. Silica dust release from inert crushing	Air transport then inhalation.	High	High	**High**	Permitted waste types are inert. The permitted level of throughput and potential size of the facility means there is potential for exposure if anyone is living or working close to the site (apart from the operator and employees). There is potential for increased dust generation from permitted activities during prolonged dry periods e.g. summer months.Nearest residential properties within 10 metres of landfill void but within 10 metres of permit boundary, but are well screened with bund and trees. .The nearest identified properties are upwind.	Dust Management Plan with regular damping down of material prior to deposition in cells..Reduce dust release by controlling speed of vehicles on site.	Low
Local human population	As above	Nuisance - dust on cars, clothing etc.	Air transport then deposition	High	Low	**Medium**	As above. Local residents often sensitive to dust, however nearest receptors are generally well screened.	Control speed limits on site to reduce vehicles generating dust. Dust Monitoring	Low
Local human population, livestock and wildlife.	As above	Nuisance, loss of amenity and harm to animal health	Air transport then deposition	Low	Low	**Low**	Agricultural land is next to the site	Dust Management Plan with dust control with regular damping down of material prior to deposition in cells.Reduce dust release by controlling speed of vehicles on site and follow Dust Management Plan	Very low
Surface Water,	Releases of particulate matter (dusts) from landfill and treatment area	Smoothering of water bodies,	Vehicles entering and leaving site.	Medium	Medium	**Medium**	Road safety, local residents often sensitive to mud on roads.All ponds are outside the site	As above. Appropriate measures could include clearing waste, litter and mud arising from the activities from affected areas outside the site.	Low

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Risk Assesment**	**Risk Management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Protected sites - European sites and SSSIs	Releases of particulate matter (dusts)	Harm to protected site through toxic contamination, nutrient enrichment, smothering, disturbance, predation etc.	Any	Medium	Medium	**Medium**	Waste operations may cause harm to and deterioration of nature conservation sites. All European Sites/SSSI are outside the zone of influen	Emissions of substances not controlled by emission limits shall not cause pollution. Works and all site operations as per the Dust Management Plan and the Particulate Matter Risk Assessment.	Low

CHADWICH LANE **NOISE AND VIBRATION** **DRAWING ESSD 2 AND ESSD12**

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Local human population	Noise and vibration	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Medium	Medium	**Low**	Local residents often sensitive to noise and vibration.Limits set out in Planning Permission..Screen bunds to be planted well in advance for further attenuation	Regular maintenance of plant to ensure silencers are correct and engines are working efficiently.Noise bunds constructed along sensitive locations, namely to the West, North and South and bunds already in place and to comply with Noise Management Plan	Low

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Protected sites - European sites and SSSIs	Any	Harm to protected site through disturbance,	Any	Medium	Medium	**Medium**	Waste operations may cause harm to and deterioration of nature conservation sites, though the noise assessment appears to conclude that noise limits beyond the boundary of the site will be acceptable.	Regular maintenance of plant to ensure silencers are correct and engines are working efficiently.Noise bunds to be constructed along sensitive locations, namely to the North and East and to enhance bunding near to the Public House.Comply with Noise Management Plan	Low

CHADWICH LANE **ACCIDENTS** **DRAWING ESSD 2 AND ESSD12**

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Local human population and / or livestock after gaining unauthorised access to the waste operation	All on-site hazards: wastes; machinery and vehicles.	Bodily injury	Direct physical contact	Medium	Low	**Low**	Detailed Standard Operating Procedures in the Site Health and Safety Manual and all staff trained on plant	Activities shall be managed and operated in accordance with a management system.Site gates locked after closing time	Low
Local human population and local environment.	Arson and / or vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from site into Horn Brook and Cornets End Brook	Medium	Low	**Low**	Permitted waste types do not include flammable materials, as not permitted in landfill so a low magnitude risk is estimated. The landfill phases are all below ground with no possibility of direct runoff.Later phases do but large screen mounds around site.Site will only take low organic matter levels so methane gas production will be extremely low so low risk of explosion	EMS procedures in place including emergencies, and spillage procedures	Low
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Pollution of water or land.	As above.	Medium	Low	**Low**	As above.	As above (excluding comments on access to waste). Permitted activities do not include the burning of waste.	Low

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
All surface waters close to and downstream of site.	Spillage of liquids, leachate from waste, contaminated rainwater run-off from waste e.g. containing suspended solids.	Acute effects: oxygen depletion, fish kill and algal blooms	Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	Low	**Low**	Site HRA indicates no leachate impact.Fuel store not considered a risk	All liquids shall be provided with secondary containment.... (applies to non- wastes such as fuels). Run-off restricted on emissions of substances, with appropriate measures. Wastes from potentially contaminated sites require analysis. Storage & spreading has distance limitations from watercourses.	Very low
All surface waters close to and downstream of site.	As above	Chronic effects: deterioration of water quality	As above. Indirect run-off via the soil layer	Low	Low	**Low**	Waste types are inert so harm is likely to be temporary and reversible.	Regular monitoring of surface permiter to ensure to no surface water leaves site that could discahrge into the River Blyhthe SSSI	Very low
Abstraction from watercourse downstream of facility (for agricultural or potable use).	As above	Acute effects, closure of abstraction intakes.	Direct run-off from site across ground surface, via surface water drains, ditches etc. then abstraction.	Low	Low	**Low**	Site not within Source Protection Zone.No private water supplies near by.As water is pumped out from within each water body to ensure that fish rescue takes place if required.	As above	Very low

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**On what did I base my judgement?**	**How can I best manage the risk to reduce the magnitude?**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Groundwater	As above	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole.	Transport through soil/groundwater then extraction at borehole.	Low	Low	**Low**	Site not within Source Protection Zone.No private water supplies near by. HRA demonstrates no release of Hazardous Substances into groundwater and non hazardous pollutants at aceptable levels	As above	Very low
Protected sites - European sites and SSSIs	Any	Harm to protected site through toxic contamination, nutrient enrichment, smothering, disturbance, predation etc.	Any	Medium	Medium	**Low**	Waste operations may cause harm to and deterioration of nature conservation sites.	Emissions of substances not controlled by emission limits shall not cause pollution. At 500 metres or above, the potential hazards from the permitted activities pose a low risk to the broad sensitivity of species and habitats groups.	Low

CHADWICH LANE **WATER** **DRAWING ESSD 2 AND ESSD12**

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Harm**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
What is at risk? What do I wish to protect?	**What is the agent or process with potential to cause harm?**	**What are the harmful consequences if things go wrong?**	**How might the receptor come into contact with the source?**	**How likely is this contact?**	**How severe will the consequences be if this occurs?**	**What is the overall magnitude of the risk?**	**Risk Assesment**	**Risk Management**	**What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).**
Local human population	The site will take inert wastes. Therefore no issues considered with groundwater and surface water	Potential for containments to enter groundwater or surface waters	Through engineered barrier	High	Very low	**Low**	Permitted waste types are inert. Site will have geological barrier on sides and base	Emissions will be free of hazardous substances and only have non hazardous waste beneath compliance limits in the landfill	Very low
Protected sites - European sites and SSSIs	The site will take inert wastes. Therefore no issues considered with SSSI in the surrounding area	Potential for containments to enter groundwater or surface waters	Through engineered barrier	High	Very low	**Low**	Waste operations will not cause harm to and deterioration of nature conservation sites. The site will not take substances above limits used in the HRA	Emissions shall be free or virtually free from odour.	Very Low