Wetherby Skip Services Ltd

Report No. 2405-016/R/002
14 June 2024
Revision 1

Quarry Works Deposit for Recovery Site

Environmental Risk Assessment

HOOPER-SARGENT LIMITED
Environmental Permitting Consultancy

Document Control

Document: Environmental Risk Assessment

Project: Quarry Works Deposit for Recovery Site

Client: Wetherby Skip Services Limited

Report Number: 2405-016/R/002

Document Checking:

Revision	Revision/ Review Date	Details of Issue	Prepared / Authorised
1	14 June 2024	Issued to EA	Phillip Roberts
0	5 June 20204	Client Review	Phillip Roberts

Contents

1 Introduction

1.1 Requirement for a Risk Assessment

This Environmental Risk Assessment (ERA) supports an application for a bespoke Deposit for Recovery (DfR) permit to be operated by Wetherby Skip Services Limited (WSSL, the Operator) at their Quarry Works Site off Field Lane, South Elmsall (the Quarry Works Site). The purpose of the DfR activity is to construct a platform within the void of a former quarry to enable the development of the site for residential housing. This ERA is an update and supersedes the original document submitted by others in response to a Not Duly Made request for further information by the Environment Agency (Agency) on 26 April 2024.

The Agency have issued online guidance[1] to support prospective waste Operators in preparing a Conceptual Site Model (CSM) to demonstrate the design of their proposed site is suitable (the CSM Guidance). The CSM is the first step in a series of documents that characterises the potential Source(s) of any pollutants associated with the Site, the Pathways by which those pollutants can travel from the Site and the Receptors potentially sensitive to those pollutants. This process enables the Operator to generate risk assessments (Step 2 of process) that can characterise and / or quantify the risk to receptors if a risk exists.

Agency Guidance: *Risk Assessments for your Environmental Permit*[2] (the Risk Assessment Guidance) requires Operators wishing to apply for a new bespoke environmental permit (permit) or change the activities in their existing permit to carry out a risk assessment. The Risk Assessment Guidance states that where activities are covered by an existing standards rules permit, the Operator can rely on the generic risk assessment for those activities if the assumptions that support them are still valid. If there is a continuous link between the Hazard, the Pathway and the Receptor, the Operator must demonstrate that the risk to the receptor is acceptably low without mitigation, or, describe what controls measures can be implemented to (alone or in combination) reduce or eliminate the emission itself, the risk of exposure or the impact on the receptor.

The outcome of the risk assessment enables the Operator to counter any potentially polluting aspects of the Site by incorporation of mitigation measures (step 3 of the process).

Report referenced 2405-016/R/001 details the CSM prepared for the Site and identifies the potential pollution sources associated with the Site, the pathways and receptors. This ERA report considers the relationship between each of those components and where a link exists assess the risk of harm occurring to human health or the environment as a result of the proposed activity.

1.2 Influencing Factors

The risk assessment process should also consider factors that are largely outside the Operators ability to prevent, but should able to anticipate and plan for. These factors may not be the direct source of an emission under normal operating conditions, but may worsen the impacts of an existing source, cause the malfunction or loss of control against an otherwise low risk hazard or make

[1] Landfill operators: environmental permits - Plan the environmental setting of your site - Guidance - GOV.UK (www.gov.uk)
[2] Risk assessments for your environmental permit - GOV.UK (www.gov.uk)

management of the site activities more challenging. Examples of these factors are the impacts from other sites, accidents, flooding and climate change.

1.3 Potential Hazards

The following emission hazards arising from the sources described in Section 2 of the accompanying CSM report are to be considered in this ERA:

- Noise and Vibration from vehicle movements
- Uncontrolled fugitive emissions including dust
- Liquid emissions from the imported waste
- Waste Stability
- Gas generated by the waste deposits or its influence on other gas sources
- Accidents that could result in a harmful emission to the environment as detailed above
- Flooding
- Climate change

1.4 Hazards identified as not significant

The following emissions hazards were not identified as relevant in the accompanying CSM report:

1.4.1 Odour

By adopting waste acceptance procedures that ensure only materials that meet the description of inert waste stated in the Annex to the Landfill Directive, the type of waste to be accepted at the DfR activity will not contain an organic or chemical component which could directly generate an odour risk. Nor will it contain substances which can react after deposit and produce potentially odorous substances. The risk of odour emissions from this facility is considered to be negligible and will not be considered further.

1.4.2 Pest and Vermin

The type of wastes to be accepted under the proposed DfR permit will not contain a putrescible component that could attract pests or vermin. Pest and vermin will not be considered further.

1.4.3 Litter

Only granular and cohesive construction, demolition and excavation wastes selected for its inert characteristics will be imported for use in the construction of the development platform at the Site. Although this material can contain incidental items of litter that may become windblown, this is considered unlikely and emissions of litter will not be considered further by this assessment.

1.4.4 Visible Plumes

There are no point source emissions to air associated with this site or the activities carried out within it, including plumes emitted from a stack or similar. Visible plumes will not be considered further in this assessment.

1.5 Potential Pathways

The type of pathways discussed in Section 3 of the CSM Report that may be relevant to the risk assessment are:

- Airborne – emissions than can transit through the air and therefore can be influenced by distance, windspeed, wind direction and ground elevation of the hazard source and / or receptor
- Overland – emissions that can transit on the surface of the ground and can therefore be influenced by the type of terrain, engineered or natural surfacing, topographical gradient, vectors that can transport the hazard e.g. vehicles, pests, flowing water or other liquids.
- Through the ground – emissions that can pass vertically or laterally through the ground to impact receptors and therefore can be influenced by physical containment (natural or engineered), ground permeability, underground services creating a preferential pathway, groundwater flow (dispersing or transporting the emission to other receptors such as surface water) and natural attenuative processes (physical, chemical or biological).

1.6 Potential Receptors

The Risk Assessment Guidance requires all receptors to be considered if they are susceptible to harm from emissions from a permitted activity. This includes:

- protected habitats and sites of scientific, geological or historical interest;
- groundwater and water supplies, water courses or water bodies;
- drainage or sewer systems;
- anywhere used to grow food or house livestock;
- homes, schools, hospitals, public buildings and private businesses;
- footpaths, playing fields and playgrounds; and,
- Public roads, railway lines or similar transport routes.

Some or all of the above have specific screening distances related to generic risk assessments associated with activities permitted under standard rules permits and these will be referenced where relevant.

2 Hazards

2.1 Waste Deposits

The type of waste to be accepted for use in the DfR activity will be non-hazardous and inert, and a mixture of construction, demolition waste and excavation waste. The construction and demolition waste will likely be granular in composition (e.g. bricks and concrete), with the excavation waste a mixture of granular and cohesive soils and stones. It is likely that the material will be off-loaded from visiting Heavy Goods Vehicles (HGVs) at or close by to the location of the materials final place of deposit. Temporary stockpiles may be formed pending excavation, blading out and compaction by Site plant.

2.1.1 Dust Generation

Stockpiles of dry granular construction and demolition waste have the potential to generate dust under dry and windy conditions. Dust can be emitted during deposit at the site by visiting HGVs, it may also be generated when the material is excavated from a stockpile for onward profiling. Static stockpiles may also generate dust due to wind-whip disturbing the dry outer surface. This could be from the stockpile itself or dried sediment accumulated from surface water run-off in the vicinity of the stockpile.

The Operator will ensure that material deposited in stockpiles at the site will be tipped from excessive height where practicable. The deposit of the material will be carried out in a controlled manner i.e. no short, sudden release of the entire load from the inclined HGV body. It is in the Operators interest to achieve a suitable mix of granular and cohesive material to form a more solid and stable platform base. This would exclude the acceptance of silty loads which when dry have a higher potential to generate fine dust. The Operator will also seek to restrict acceptance of already dry and excessively dusty loads to site.

The depth and dimensions of the former quarry mean that the DfR construction activity will be carried out below surrounding ground levels for much of its duration. The existing layout of the site is conducive to movement of road-going HGVs i.e. shallow gradients on the access road and therefore they will be able to transit to the point of deposit. This reduces the requirement for double-handling the material with onsite dumpers running between a tipping bay and point of deposit. The sub-surface position of the quarry affords shelter from any crosswinds that may further mobilise dust emissions.

The DfR activity will be completed in 3 Stages enabling one area to achieve its required level, commission the surface water management system and if need be implement temporary cover measures such as grass seeding to prevent wind-whip of surface dust.

2.1.2 Noise Generation

Deposit of waste in temporary stockpiles and subsequent reprofiling has the potential to generate noise from the movement of the material itself and the plant used for the activity. Similar consideration will be given to the minimisation of noise generation as that to dust generation i.e. material will not be tipped from height where possible and not in a manner which would generate excessive noise. Vehicle movements will be kept to a minimum to maximise operational efficiency

and all vehicles / plant will be serviced in accordance with manufacturers recommendations to ensure maintenance issues do not exacerbate noise generation.

Like dust generation noise emissions will be mitigated by carrying out activity below surrounding ground levels for the majority of the projects duration. This obstructs the line-of-site for noise to directly impact sensitive receptors. When infilling of the void means activities have risen to surrounding ground levels, the Operator will ensure vehicle movements are kept to a minimum close to the boundary of the Site, with low noise alternatives sought for placement of material close to the site boundary e.g. use of smaller, less noisy plant.

All Site plant will be fitted with silencers on their exhausts and / or other noise attenuation measures. To minimise the impact of intrusive noise generation, the planning consent prohibits the operation of the activity between the hours of 08:00 and 18:00 Monday to Friday, and 08:30 to 13:00 on Saturdays. Any activity is prohibited on a Sunday, bank holidays and public holidays. The planning consent also requires the operator to ensure that ambient noise levels do not exceed 55 dB and noise does not exceed 70 dB at a noise sensitive property.

2.2 Vehicle Activity

The types of mobile plant to be employed at the proposed activity will likely be limited to a tracked 360 excavator only. This will be used to position the waste as required and compact it by over tracking. Visiting HGVs will deposit waste in designated areas inside the void. Potential emissions associated with vehicles on site are noise and dust, similar to that discussed above. In addition there is potential for visiting vehicles to track mud onto the public highway (Field Lane) when they leave site. Mud or other debris tracked onto a public highway can cause loss of traction when wet or very dry; can extend the potential for dust generation away from site, can be washed into surface water systems not otherwise directly associated with the Site or cause a general nuisance by its unsightliness or making passing vehicles dirty.

The Operator will ensure that when not in use, vehicles are not left with their engines idling which may generate unnecessary noise or exhaust emissions. Vehicles transiting around the site will use the designated haul routes and not travel at excessive speeds which may generate dust emissions. Depending on the ground and weather conditions it may be necessary to limit speeds to a threshold lower than the limit specified in the planning consent. In dry conditions, particularly when wind speeds may result in dust leaving the site boundary, the Operator will deploy a water bowser to dampen down haul roads. They may also limit traffic to a prescribed route to focus the use of the bowser.

The Operator will prolong the use of the existing concrete hardstanding on Site for as long as practicably possible. The greater the distance vehicles are able to travel on this surface, the less likely they are to pick up mud or debris; or, be able to dislodge any material that may have attached to the vehicle wheels or body. Whilst still exposed, the concrete surfacing and adjacent public roadway will be swept at least daily by a dedicated road sweeping vehicle. This vehicle will also have the ability to clear any debris that may accumulate in road drains. Where it is unavoidable to place DfR material over the concrete hardstanding, The Operator will preferentially select and place hardcore material on the trackways used by visiting HGVs. This will provide a more robust running surface, reduce vehicle rutting and minimise build-up of mud and silt. The Operator will also install a wheel bath at the base of the access ramp for drivers to clean down their vehicles before leaving Site. The wheel bath will

always positioned at the toe of the ramp, the position of which will change as infilling progresses. This means HGVs will always drive onto a concrete hardstanding after the bath when leaving site. Site operatives will also inspect visiting vehicle to ensure they do not leave site with excessive mud or debris attached to their vehicles. The operatives will also make regular checks of the trackways and road to ensure they are clean and if observed to deteriorate, instruct the road sweeper to attend as soon as practicably possible.

2.3 Potential Emissions from the DfR Waste

2.3.1 Leachate

The Quarry Works Site will be classified as a Deposit for Recovery Activity using non-hazardous waste that meets the Waste Acceptance Criteria (WAC) for an inert landfill Site as detailed in Council Decision 2003/33/EC: establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (the Annex to the Landfill Directive (LFD) - Council Decision 1999/31/EC). The type of material to be accepted at the DfR activity will be referenced in this report as meeting the "LFD Inert WAC".

Confirmation that it is non-hazardous and compliant with the LFD Inert WAC may be based on the verified source and site history of the waste or by laboratory testing of representative samples taken from the source site. Although it will be inert waste, the potential remains for soluble substances to be leached from it as water percolates through the material. If relevant substances are at sufficiently high concentrations they may contaminate underlying sensitive groundwater or surface water receptors. This risk is considered in more detail in the accompanying Groundwater Risk Assessment referenced 2405-016/R/003.

2.3.2 Gas

The application of the LFD Inert WAC or selection of source material to subsoil and stones from uncontaminated sites, will restrict the organic content of the waste and its ability to generate landfill gas. Elevated concentrations of biogenic methane can normally be detected in inert waste deposits however, albeit in low quantities. The placement of inert waste against the previously exposed quarry faces brings with it the risk of lateral migration which is considered in more detail in the accompanying Ground Gas Risk Assessment in Annex 2.

2.4 Landform Stability

The Operator intends to import waste types which are geotechnically suitable for building a stable development platform which in turn can be built upon. The Operator proposes to import a mix of granular and cohesive construction, demolition and extraction wastes which will provide physical strength and stability to the platform. This type of material will typically form a stable slope at a gradient not exceeding 1v:3h. Gradients in excess of that could result in slippages and an unsafe working area. The final landform will be flush with the surrounding ground levels with a slight gradient (<1v:30h) falling toward the east. On completion there will be no raised features associated with the platform above surrounding ground levels which if they became unstable could result in a slip or collapse into neighbouring properties or jeopardise the development on the platform.

For practical purposes the Operator wishes to maintain site-wide access to HGVs for as long as possible to minimise movement of material by site plant. To achieve this they will place the material

in shallow lifts over a wide area and create shallow access ramps onto each lift of material the HGVs can transit / reverse up and down safely. The sub-surface quarry faces will provide confinement of the material and enable a good level of compaction and consolidation. The completion of the accompanying CSM has prompted a review of the phasing plan submitted with the original application. Material will now be placed first in the south and southwestern area of the site (Phase 3), with deposit operations extending northwards into Phase 1), with Phase 2 being the last area of Site to be filled.

The use of shallow ramps to enable HGVs to safely access the active deposit areas means any slope faces will be significantly shallower than 1v:3h. When the deposit operations reach the toe of the current access ramp tying in Phase 1 and Phase 2, it is likely the material will be placed in near horizontal lifts. The stability of the deposited material is unlikely to be a significant issue and will not be considered further in a detailed stability risk assessment.

2.5 Flooding

Flooding of the site may result in disruption to normal site operations and damage to infrastructure. It may also inundate areas which under normal circumstances do not represent a risk of pollution provided appropriate controls are in place e.g. waste storage areas, bunded areas, buildings etc. Flood water may mobilise polluting substances from those locations to other more sensitive settings such as water courses, habitats or human receptors.

The Site is in a Flood Zone 1 which means there is a low risk of flooding from rivers and the sea. The Enzygo Flood Risk Assessment Report (FRA) referenced SHF.0114.001.HY.R.001.A concluded the Site had a negligible risk of flooding by groundwater intrusion. This correlates with the assumed depth to the water table beneath the site described in Section 3.1.1 of the accompanying Groundwater Risk Assessment (GWRA). The FRA concluded that the risk of surface water flooding was negligible for most of the Site, but low to medium in the quarry void after a 1 in 75, 1 in 200 and 1 in 1000 year surface water flooding event. It is assumed in those events water will accumulate in the base of the quarry and would eventually drain away as per current Site conditions (described in detail in the accompanying GWRA). The placement of cohesive fill across the base of the former quarry will likely reduce its ability to drain accumulated surface water however.

The phased infilling of the Site will allow a similarly phased construction of the surface water management system to be submitted under the requirements of the planning consent. Once at level, the platform will start shedding water toward the east and south in Phase 3, the east and north in Phase 1 and east and north in Phase 2. The perimeter drain will be constructed before the final slope gradient is completed and so begin the transition away from water flowing into the void and toward the storm sewer instead. A component of water will still percolate through the DfR deposits, however this is considered to be significantly less than historical inputs within the quarry.

2.6 Accidents

The existing management controls significantly reduce the risk of emissions harmful to human health and environment occurring under normal operating conditions. However there may be instances where damage to site infrastructure may occur unintentionally as a result of an error or accident result in a potentially polluting emission. Intentional damage of infrastructure can also potentially occur as a result of trespass and vandalism. Other interruptions to the activity can also occur as a result of

vehicle or plant breakdown. Plant are also at risk of fire if a source of ignition, fuel and oxygen is present. Damage can occur as a direct result of the fire or secondary impacts such as contaminated run-off from water used to fight the fire. If not contained the fire could spread to other plant or flammable materials.

The most likely incident to occur is mechanical damage from a collision to a vehicle, plant or storage vessel which results in release of fuel that may contaminated the ground, groundwater or surface water. A vehicle fire in unlikely but extinguishing a fire may require use of water, foam or other fire extinguisher, the residue from which may be contaminated by combustion products or other polluting liquids associated with the vehicle.

No fuel or other potentially contaminating liquids will be stored on Site, with the 360 excavator refuelled by a road tanker equipped with spillage prevention and remediation equipment. All personnel are legally required to be compliant with safe traffic management on site and site rules used to enforce it. Speed limits will be complied with to ensure drivers do not lose control of their vehicles that may result in a collision. Particular care will be taken with the operation of vehicles in the vicinity of fuel storage areas or other storage vessel that if compromised may result in adverse environmental or operational impacts. The Site will be is secured by secure fencing and lockable security gates at the main entrance. All vehicles will be fitted with fire extinguishers and be subject to maintenance checks / MOT to ensure the risk of a malfunction is minimised. Spill kits will be available on site in the event of a leak or loss of containment of a potentially harmful liquid. In the event a spillage or similar does occur, the extent of the area impacted will be delineated as soon as possible. The affected material will be excavated and subject to appropriate testing to ensure the correct information is gathered for its onward treatment or disposal at a suitably permitted facility.

An accident management plan for the Site is detailed in Section 6.

2.7 Climate Change Considerations

Current Agency Management System guidance[3] requires all operators that were issued an environmental permit before April 2023 to have completed a Climate Change Risk Assessment for their site. This is to consider the potential impacts associated with higher temperatures, more heatwaves and hot days, rising sea levels, changes in rainfall patterns and intensity and more storms.

The Climate Change aspect of this Environmental Risk Assessment will consider the potential impacts associated with potential emissions under current climate conditions and how they may be aggravated by the influences of climate change. Table 1 below considers the examples detailed in Agency guidance: *Non-hazardous and inert waste treatment: examples for your adapting to climate change risk assessment*[4]. A review of the relevance of the examples listed is detailed in **Error! Reference source not found.** below. That identified the following climate impacts as relevant to the proposed activity:

- Higher summer temperatures may cause equipment to overheat.
- Dust emissions may be more likely under drier temperatures.

[3] Develop a management system: environmental permits - GOV.UK (www.gov.uk)
[4] Non-hazardous and inert waste treatment: examples for your adapting to climate change risk assessment - GOV.UK (www.gov.uk)

- Water supply to dust mitigation may be restricted under drought conditions.
- Equipment may be vulnerable to lightening strikes.

The measures to be put in place to mitigate against the impacts identified above are discussed in later sections of the ERA.

Table 1 – Climate Change Impacts

Impact	Description	Relevant (Yes / No)	Justification
Summer Daily Maximum temperature			
1	Waste reactions or fire	No	No combustible or reactive waste accepted at site
2	Equipment fire	No	No plant used for treatment of waste
3	High temperature expansion / stress	No	No pipework or similar to be used on site.
4	Dust emissions	Yes	DfR material temporarily stored in stockpiles or when placed on landform.
5	Water supply	Yes	Potential reliance on water for dust mitigation.
6	Pest and scavengers	No	No putrescible wastes that could attract pests.
7	Wildfires	No	DfR material not flammable.
Winter Daily Temperatures			
1	Odour / pests	No	Inert waste not odorous and does not attract scavengers.
2	Frozen pipework	No	No pipework required.
Daily Extreme Rainfall			
1	Flooding	Yes	Site may be vulnerable to surface water flooding.
2	Overwhelmed drainage	No	Impermeable surface and sealed drainage not required for waste storage / treatment.
Average Winter Rainfall			
1	Flooding	Yes	Site not vulnerable to flooding.
2	Overwhelmed drainage	No	Completed landform will likely discharge surface water to Field Lane drains.
Sea Level Rise			
1	Coastal flooding	No	Elevation of site does not make it vulnerable to flooding at hightide + 0.6m [5]
Drier Summers			
1	Water restrictions	Yes	Potential reliance on water for dust mitigation
2	Site discharges	No	No requirement for consented discharge from Site reliant on dilution in receiving water course.
River Flow			
1	On-site drainage systems	No	No direct discharge to watercourses susceptible to flooding.
Storms			
1	High winds	No	Activities largely sheltered in former quarry void. Rain accompanying storm will prevent high winds mobilising dust.
2	Above ground tanks	No	No above ground tanks on jacks
3	Lightening strikes	No	No on-site infrastructure to damage.

[5] Climate Central | Land below 0.6 meters of water

2.7.1 Equipment Fire

Increased summer temperatures may cause electrical components in plant or other equipment to exceed their safe heat rating and increase the risk of malfunction or fire. The Operator will review the heat rating of all their equipment and if an issue is likely implement additional protections such as supplementary cooling systems.

2.7.2 Dust Emissions

Certain components of the waste management process at the site may be a source of fugitive dust emissions. Controls to manage dust emissions under current climate conditions will continue to be implemented, however the Operator will place particular focus on weather forecasts to predict when prolonged dry spells are imminent. This will enable the Operator to consider what resources need to be available to mitigate dust emissions and if there is likely to be a shortfall.

2.7.3 Water Supply and Restrictions

The Operator will use a road sweeper to apply water and sweep dust from external and internal road roads. This will be topped up at the vehicle depot who will ensure there is a ready water supply to the sweeper or mobile tanker whilst the site is operational. They may consider water conservation measures in the future e.g. harvesting and storing rain water or suspending operations at Site if supply of water is likely to be restricted.

2.7.4 Lightning Strikes

Climate change may bring with it an increased risk of severe storms, including thunder storms and an increased risk of lightning strikes. A lightning strike to any plant or building on site may result in significant damage or injury to the occupants or nearby personnel. The topography in the surrounding area is dominated by large buildings which may represent a more preferential point of contact for lightning than vehicles in the base of the quarry or at ground level.

3 Potential Pathways

3.1 Airborne Pathways

The potential pathways for dust and particulates to reach sensitive receptors are via the air via wind transmission. Transit of airborne emissions will therefore be determined by the prevailing wind direction and physical obstructions. Additionally, there may be an interrelationship between the nature of a potentially harmful emission and how it behaves in transit. The prevailing wind direction in the locality is from the west-southwest[6], with the wind blowing from that direction 23.4% of the time. Collectively the wind blows from the southwest, south-southwest or south 32% of the time. This means any receptor to the east-northeast of the site is most likely to receive emissions from the site if they are within a relevant screening distance (see Section **Error! Reference source not found.**), with receptors to the north to northeast the next most likely to receive emissions if relevant.

Wind blowing from the west-southwest and southwest may be obstructed by the two-storey residences, dense scrub and trees on the western boundary. Subject to the stage and location of infilling, Site activities may be below surrounding ground levels affording additional shelter from the wind. There may be an element of shelter afforded when wind blows directly from the south by the trees / hedgerow on the southern verge of Field Lane.

3.2 Overland Pathways

Airborne emissions of particulates may be blown across the surface of the land and if unobstructed may reach sensitive receptors. The majority of the site is surrounded by hedgerows and semi-mature trees.

The ground surface may also act as a pathway for the mobilisation of potentially polluting substances in surface water run-off dissolved or in suspension. The primary pollutant of concern would be mobilisation of suspended solids which could enter a surface water receptor and cause increased turbidity or silt accumulation. There are no direct discharges of surface water runoff from the site to surface watercourses. A surface water drainage system will be progressively installed to manage the water running-off the platform surface that was previously confined to the quarry. This will be integrated to any road or other drainage associated with a future residential development in accordance with the planning consent.

Water containing dissolved substances, as a film e.g. oil or direct spillages of polluting liquids e.g. fuel may flow over the ground surface and enter surface water courses / bodies as above, or may soak into the ground away from the point of emission. No fuels will be stored on Site, with refuelling of site plant carried out by a road tanker which will carry with it appropriate spill mitigation measures.

3.3 Through the Ground

Spillages on the ground of potentially polluting liquids such as fuel will likely result in a significant proportion of that liquid percolating into the subsurface. That liquid may then transit vertically until it encounters an impermeable or low permeability barrier such as clay or concrete and then spread

[6] Wakefield Wind Forecast, West Yorkshire WF1 2 - WillyWeather

laterally across it. It may also travel vertically or laterally via sub-surface structures such as buried services or boreholes. Sub-surface receptors such as groundwater may also act as a pathway for pollutant transmission to other receptors such as surface water if they are in continuity with one another. This is considered in more detail in the accompanying Groundwater Risk Assessment.

4 Receptors

4.1 Relevant Receptors

This ERA considers only receptors that are sensitive to airborne emissions including noise, mud on the road, and potential accidents associated with the activity. This includes the influence of climate change on those emissions. Potential emissions to groundwater and surface water and the risks associated with gas generation are considered separately in the Groundwater Risk Assessment and The Ground Gas Risk Assessment.

The sensitivity of the different types of receptors listed in Section 1.6 to the emissions described above is summarised in Table 2.

Table 2 – Receptor Sensitivity

Receptor type	Emission / Hazard					
	Dust	Noise	Mud on road	Accidents	Flooding	Climate Change
Protected habitats	Yes	Yes	No	No	No	Yes
Sites of Geological or Historical Interest	Yes	Yes	No	Yes	No	Yes
Food production or livestock management	Yes	No	No	No	No	Yes
Homes, schools, hospitals, public buildings, private businesses	Yes	Yes	No	No	No	Yes
Footpaths, playing fields and playgrounds	Yes	Yes	No	No	No	Yes
Public roads, railway lines or similar transport networks	Yes	No	Yes	No	Yes	Yes
Sensitive groundwater and surface water bodies	No	No	Yes	Yes	Yes	Yes

4.1.1 Justification for Receptor Sensitivity

Protected or sensitive habitats may be adversely impacted by the settlement of dust on vegetation or disturbance by noise. Where a pathway exists, sites of geological interest may be affected by ground contamination that could alter the integrity of the strata. Persons visiting sites of geological or historical interest may have that experience adversely impacted by dust or noise nuisances, or may have respiratory health issues. Food production quality may be impacted by dust settlement on crops. Dust emissions may represent respiratory health hazard to sensitive individuals or be a nuisance to homes or businesses, or impact product quality. Noise may be a nuisance to homes or businesses or disturb individuals in hospitals or schools. Dust and noise emissions may impact the enjoyment of public or leisure spaces, or represent a respiratory hazard to sensitive individuals. Dust may impair the visibility of drivers on adjacent roads and mud tracked onto roads may present a hazard or nuisance to vehicles in transit past the Site.

Mud tracked onto the road may be washed into the storm sewer and discharge into a sensitive water course. An accident on site resulting in the spillage, discharge or accumulation of contaminated liquid could percolate through the ground and into the groundwater. Flooding of the Site may add an additional unsustainable volume of water to the surface water drainage network that may exacerbate flooding downstream. Where dust emissions are identified as a potential hazard, dust generation could be exacerbated by dry conditions as a result of climate change. Where flooding is identified as an issue, this could also be exacerbated by a greater likelihood of high rainfall events as a consequence of climate change.

4.1.2 Screening Distances

The Agency Guidance for the preparation of Dust Management Plans[7] states that any bespoke permit application for the recovery of household, commercial or industrial waste by deposit for recovery, should provide a dust management plan if it is within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar. Noise emissions should be considered if there is a risk of noise and vibration beyond the site boundary. No explicit limits are prescribed for mud on the road, however it is assumed any road within the immediate vicinity of the Site that may reasonably be impacted by mud on the road should be considered.

4.2 Receptor Locations

When identifying the receptors, the closest or the most sensitive (if different from the closest) have been considered in each direction from the hazard. Account has been taken of the pathway and mechanism of transport to the sensitive receptor e.g. wind direction, ground conditions or physical topography. Receptors are considered sensitive where people and habitats that occupy them have the potential to be adversely affected by the emissions.

The probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching the receptor (e.g. frequency of prevailing wind in that direction). This stage of the assessment assumes that exposure has resulted from an uncontrolled emission i.e. without mitigation.

Where two or more receptors of the same type or perceived vulnerability are located in the same direction relative to site, the risk assessment will conservatively consider the closest receptor of each given type only.

4.2.1 Protected Habitats

The nearest European Site or other protected habitat including National Nature Reserves (NNR), Local Nature Reserves (LNR), Local Wildlife Sites (LWS) and Ancient Woodland is the Upton Country Park LNR approximately 1.3 km to the north. The distance to this site is in excess of the thresholds prescribed for the generic risk assessments that support a standard rules waste recovery permit. The potential impacts on this Site will not be considered further.

The Frickley Beck to south of the Site is not designated as a protected habitat but may be the eventual indirect receptor to clean surface water discharges from the Site. The water quality in the Beck from

[7] Control and monitor emissions for your environmental permit - GOV.UK (www.gov.uk)

Frickley Beck to the Skell[8] is described by the Agency as having a "Moderate" ecological classification with a "poor" classification for biological elements and "Moderate" for Physico-Chemical elements. The primary cause of these classifications is attributed to the discharges from waste water treatment.

4.2.2 Sites of Geological or Historical Interest

The South Elmsall Quary SSSI is located 265 m to the east of the Site. This Site is understood to be a popular destination for geologists and therefore consideration of the risks associated with dust and noise will be considered further. There are no historical monuments of interest within 3 km of the Site and they will not be considered further.

The SSSI will be subject to a Habitats Regulations assessment by the Agency. The SSSI classification is not associated with a sensitive habitat and it is assumed the assessment will conclude there is no risk to the Site in that regard. The impact of emissions resulting from an accident will be examined in detail in the accompanying Groundwater Risk Assessment.

4.2.3 Food Production / Livestock Management

There are no livestock management activities carried out in the vicinity. Finley Beverages is located 265 m to the north. A Superdrug distribution centre is located 260 m to the north-northeast and a Asda distribution centre is located 475 m to the north-northeast. The Chip Pan takeaway (next to High Street Stores) is located 150 m to the west-southwest. Agricultural field occupy the surface of the landfill site to the immediate south.

4.2.4 Homes, Schools, Hospitals, Public Buildings and Private Businesses

Residential housing dominates the setting to the west and southwest, with the nearest houses off East Avenue to the west less than 10 m from the Site and a house 20 m from the northern boundary of the Site. It is assumed the building on the immediate east boundary is a residence and it is understood a bungalow is planned further south of that. All of these houses have gardens that directly abut the Site boundary. 40 m further east of the Site Boundary is a lodging house called Montessa. The houses on Valley View and Valley Avenue 135 m to the southwest are associated with a large residential area.

The large distribution activities associated with the Dale Lane Industrial estate dominate the land to the north and east. Numerous large warehouses owned by the Next organisation are present 205 m to the north, 50 m to the east and 330 m to the southeast. Amongst this is an outlet shop for Next staff 265 m to the north-northeast and the Crossroads Truck and Bus vehicle supplier 200 m to the north. A new parking area has been recently constructed 85 m to the north.

Askew Aggregates is located on the immediate eastern boundary of the Site. A landfill operated by Askew Aggregates is located 500 m to the south of Site, with an access road that joins Field Lane 240 m to the east.

[8] Ea Beck from Frickley Beck to the Skell | Catchment Data Explorer | Catchment Data Explorer

4.2.5 Footpaths, Playing Fields and Playgrounds

There are no playing fields, playgrounds or similar in the immediate vicinity of the Site. A recreational walking route is located 300 m to the southeast / south. The public footpath along the north verge of Field Lane terminates to the west of the Site entrance.

4.2.6 Public roads, Railway Lines or other Transport Networks

Field Lane is orientated east to west along the southern boundary of Site. The closest residential street is East Avenue in the adjacent housing estate to the west. Stadium Way and Elmsall Way service the Dale Lane Industrial Estate and are located 200 m to the north and 300 m to the northeast respectively.

4.2.7 Receptor Summary

The distance of these receptors to the proposed permit boundary, their direction relative to the main treatment activities and the frequency the wind blows in the direction of the receptor is detailed in Table 3 below. The relevant sensitive receptors to the Site activities are also identified in drawing referenced 2405-016/D/001 attached in Appendix A. Where a receptor extends across a wide area incorporating a range of wind directions and distances, the shortest distance and most frequent wind direction will be used. Where the location of Operations on the Site may dictate a receptors position relative to emissions the most conservative wind direction and distance will also be used.

Table 3 – Potentially Sensitive Receptors

Receptor ID	Receptor Name	Receptor Description	Direction from Main Site	Distance from Permit Boundary (m)	Frequency Downwind (%)
1	Residential Property	Residential	N	20	10.6
2	Next Returns Centre	Commercial	N	205	10.6
3	Finley Beverages	Manufacturing	N	265	10.6
4	Cherry Lea Carpark	Commercial	N	85	10.6
5	Stadium Way	Road	N	200	10.6
6	Next Staff Shop	Commercial	NNE	265	9.5
7	Asda Distribution Centre	Commercial	NNE	475	9.5
8	Elmsall Way	Road	NE	300	12.1
9	Next Stadium 2 Warehouse	Commercial	NNE to E	50	23.5
10	Askew Aggregates	Industrial	E	<10	23.5
11	Montessa Lodgings	Commercial	E	40	23.5
12	Proposed Bungalow	Residential	E	<10	23.5
13	Next E3 Warehouse	Commercial	ESE to SE	330	1.3
14	South Elmsall Quarry SSSI	Geological Feature	ESE	265	1.2
15	Recreational route	Footpath	SE to S	300	1.3
16	Restored landfill	Agricultural Field	SE to S	10	1.3
17	Askew Aggregates Landfill	Landfill	S	500	1
18	Field Lane	Public Road	S	<10	1
19	Valley View / Avenue properties	Residential	S to SW	135	3.5
20	Chip Pan / High Street Stores	Takeaway / shop	WSW	150	6.7
21	East Avenue Properties	Residential	W to NW	<10	6.4
22	East Avenue	Street	W to NW	70	6.4
23	Superdrug Warehouse	Commercial	NW	260	2.9
24	Crossroads Truck and Bus	Commercial	NNW	200	6.1

5 Risk Assessments

A qualitative assessment will be made of the risk to identified receptors from potentially harmful emissions associated with:

- Dust - Table 4
- Noise - Table 5
- Mud - Table 6
- Flooding – Table 7

Climate Change impacts are incorporated into Dust and Flooding Tables as appropriate. The consequences of accidents will likely impact groundwater receptors primarily and this is considered separately in the Groundwater Risk Assessment in Annex 1.

The tables list the:

- Nature and source of the emission or hazard;
- Receptor reference number listed in Table 3;
- Direction of the receptor relative to Site;
- Receptors distance from Site;
- Frequency downwind of Site (where relevant);
- Likelihood of receptor exposure to the emission or hazard;
- Unmitigated risk i.e. without controls; and,
- Residual risk after controls or other considerations have been applied.

The unmitigated impact will also reflect the influence of existing features that may enhance or reduce the emission, for example physical barriers that will be present throughout the duration of the activity and after its completion. The type of receptor will also reflect its sensitivity to certain emissions. For example employees in a busy commercial warehouse will not be sensitive to external noise when their own operation is inherently noisy.

Table 4 – Dust Risk Assessment

Type / Source of Emission / Hazard	Receptor ID	Direction from Site	Dist from Site	% Freq Down - wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
Dust emissions generated by: Deposit of inert material by delivering HGVs Grading / profiling of deposited material Vehicle movements on Site Wind-whip of dry surfaces under normal conditions and long dry spells exacerbated by climate change	1	N	20	10.6	High – occasional wind direction and close proximity	High – receptor sensitive to dust	DfR activity confined to small area with one 360 excavator operational at any one time. Activity will be enclosed within former quarry void for majority of operational life of site which also benefits from dense thickets of vegetation around Site. HGVs will deposit material close to place of permanent deposit and not from height to prevent impact emissions of dust. Requirement for stockpiles limited to discrete loads granular material occasionally reserved for use in Site haul roads. These are unlikely to extend above ground level. Concrete hardstanding will be retained as long as practicably possible to provide cleanable surface to reduce potential for mud disturbance on unmade roads. If concrete surface is not available granular material will be selected for use in Site roads. Road sweeper will be employed to sweep internal and external roads to remove tracked mud that could	Low
	2	N	205	10.6	High – occasional wind direction and close proximity	High – receptor sensitive to dust		
	3	N	265	10.6	Medium – occasional wind direction and distance	High – receptor sensitive to dust		
	4	N	85	10.6	High – occasional wind direction and close proximity	High – receptor sensitive to dust		
	5	N	200	10.6	Medium – occasional wind direction and distance	Low – vehicles unlikely to be impacted		
	6	NNE	265	9.5	Medium – occasional wind direction, extended distance	High – receptor sensitive to dust		
	7	NNE	475	9.5	Low - occasional wind direction, very distant	Low – unlikely to be exposed		
	8	NE	300	12.1	Medium – occasional wind direction and distance	Low – vehicles unlikely to be impacted		
	9	NNE to E	50	23.5	High – prevailing wind direction and close proximity	High – receptor sensitive to dust		
	10	E	<10	23.5	High – prevailing wind direction and close proximity	Medium – receptor less sensitive to dust		
	11	E	40	23.5	High – prevailing wind direction and close proximity	High – receptor sensitive to dust		
	12	E	<10	23.5	High – prevailing wind direction and close proximity	High – receptor sensitive to dust		
	13	ESE to SE	330	1.3	Low – very infrequent wind direction, extended distance	Low – unlikely to be exposed		
	14	ESE	265	1.2	Low – very infrequent wind direction, extended distance	Low – unlikely to be exposed		
	15	SE to S	300	1.3	Low – very infrequent wind direction, extended distance	Low – unlikely to be exposed		
	16	SE to S	10	1.3	Medium – very infrequent wind direction, close distance	Medium – crops could be impacted		
	17	S	500	1	Low – very infrequent wind direction, extended distance	Low – unlikely to be exposed		

Type / Source of Emission / Hazard	Receptor ID	Direction from Site	Dist from Site	% Freq Down - wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
	18	S	<10	1	Medium – very infrequent wind direction, close distance	Low – passing vehicles unlikely to be impacted	dry and generated dust when disturbed by vehicles or wind. Completed areas of development platform will be seeded to stabilise the surface by establishing vegetative cover.	
	19	S to SW	135	3.5	Medium – infrequent wind direction, close distance	Medium - receptor sensitive to dust but infrequently exposed		
	20	WSW	150	6.7	Medium – occasional wind direction, close distance	High - receptor sensitive to dust and maybe exposed		
	21	W to NW	<10	6.4	High – occasional wind direction, close distance	High - receptor sensitive to dust and may also be exposed in calm conditions		
	22	W	70	6.4	High – occasional wind direction, close distance	High - receptor sensitive to dust and may also be exposed in calm conditions		
	23	NW	260	2.9	Low – infrequent wind direction, extended distance	Low – unlikely to be exposed		
	24	NNW	200	6.1	Medium – occasional wind direction, extended distance	High – receptor sensitive to dust		

Table 5 – Noise and Vibration Risk Assessment

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
Noise emissions generated by: Vehicle movements on Site Deposit of inert material by delivering HGVs Profiling / tracking in of deposited material	1	N	20	10.6	High – close proximity	High – receptor sensitive to noise	The potential for noise emissions will become most prevalent when infilling activities reach surrounding ground levels. Visiting HGVs will deposit material in the void as close to the point of final placement as possible, limiting on-site internal plant movements where possible. Site speed limits will be enforced where the natural confines of the former quarry do not already impede them. Material will not be tipped from height e.g. over embankments. Site plant will be fitted with silencers / noise attenuation measures to minimise noise nuisance to neighbours in accordance with planning consent. Site speed limits will be enforced to reduce noise from engine, vehicle body and vehicle transit. Operator required to ensure ambient noise levels do not exceed 55 dB or 70 dB at noise sensitive receptor.	Low
	2	N	205	10.6	High – close proximity	Low – receptor not sensitive to noise		
	3	N	265	10.6	Medium – extended distance	Low – receptor not sensitive to noise		
	4	N	85	10.6	High – close proximity	Low – receptor not sensitive to noise		
	5	N	200	10.6	Medium – extended distance	Low – receptor not sensitive to noise		
	6	NNE	265	9.5	Medium – extended distance	Low – receptor not sensitive to noise		
	7	NNE	475	9.5	Low - very distant	Low – not sensitive to noise		
	8	NE	300	12.1	Low – extended distance and limited line of sight	Low – receptor not sensitive to noise		
	9	NNE to E	50	23.5	High – close proximity	Low – receptor not sensitive to noise		
	10	E	<10	23.5	High – close proximity	Low – receptor not sensitive to noise		
	11	E	40	23.5	High – close proximity	High – receptor sensitive to noise		
	12	E	<10	23.5	High – close proximity	High – receptor sensitive to noise		
	13	ESE to SE	330	1.3	Low – extended distance	Low – receptor not sensitive to noise		
	14	ESE	265	1.2	Low – extended distance and below surrounding ground levels	Low – unlikely exposure to noise		
	15	SE to S	300	1.3	Low – extended distance and topographically lower than Site	Low – unlikely to be exposed		
	16	SE to S	10	1.3	High – close distance	Low – not sensitive to noise		
	17	S	500	1	Low – very distant	Low – not sensitive to noise		

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
	18	S	<10	1	High – close proximity	Low – not sensitive to noise	Activity hours restricted by planning consent to prevent noise nuisance during unsociable hours.	
	19	S to SW	135	3.5	Medium – close proximity	High – receptor sensitive to noise		
	20	WSW	150	6.7	Medium – close proximity	Medium – receptor less sensitive to noise		
	21	W to NW	<10	6.4	High – close proximity	High – receptor sensitive to noise		
	22	W	70	6.4	High – close proximity but shielded by houses to east	Low – not sensitive to noise		
	23	NW	260	2.9	Low – extended distance	Low – not sensitive to noise		
	24	NNW	200	6.1	Medium – extended distance	Low – not sensitive to noise		

Table 6 – Mud Risk Assessment

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
Mud emissions generated by: Vehicles leaving Site and tracking mud or debris onto the public road picked from the DfR activity	1	N	20	10.6	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity	Site Plant (360 Excavator) will be retained on Site and will only be moved by use of low-loader i.e. will not track onto public road. Existing concrete surfacing will be retained where practicably possible to enable maintenance and cleaning to prevent disturbance and mud generation on running surfaces. Where concrete surfacing is not available the Operator will select and place granular material to act as haul roads. Wheel bath will be placed at toe of access ramp and all vehicles exiting Site will be required to use it. Wheel bath will be regularly inspected and any accumulated mud or silt removed as required.	Low
	2	N	205	10.6	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	3	N	265	10.6	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	4	N	85	10.6	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	5	N	200	10.6	Low – mud would have to be tracked 1.4km to impact receptor	Low – road unlikely to be impacted		
	6	NNE	265	9.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	7	NNE	475	9.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	8	NE	300	12.1	Low – mud would have to be tracked 1.4km to impact receptor	Low – road unlikely to be impacted		
	9	NNE to E	50	23.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	10	E	<10	23.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	11	E	40	23.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	12	E	<10	23.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	13	ESE to SE	330	1.3	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	14	ESE	265	1.2	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	15	SE to S	300	1.3	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	16	SE to S	10	1.3	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	17	S	500	1	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
	18	S	<10	1	High – immediate receptor to mud from Site	High – possible loss of traction to passing vehicles / dirt nuisance		
	19	S to SW	135	3.5	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	20	WSW	150	6.7	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	21	W to NW	<10	6.4	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	22	W	70	6.4	High – mud tracked onto Field Lane could subsequently be transferred to East Avenue	High – possible loss of traction to passing vehicles / dirt nuisance		
	23	NW	260	2.9	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		
	24	NNW	200	6.1	N/A – receptor not exposed to mud on road	N/A – no receptor sensitivity		

Table 7 – Flooding Impact Risk Assessment

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
Flooding of Site after high rainfall event exacerbated by Climate Change	1	N	20	10.6	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity	Entirety of Site is currently positioned below surrounding ground levels in a former quarry. Any runoff from heavy rain will be contained in the void up until final levels are reached. SUDs-based surface water management scheme will be implemented in advance of each phase reaching the final development platform level. This will enable transition from informal containment and dispersal of flood water within quarry void to engineered solution which reduces emissions to ground via existing non-hazardous waste deposits. Surface water management scheme will be designed to account for excess flows anticipated as a result of climate change.	Low
	2	N	205	10.6	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	3	N	265	10.6	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	4	N	85	10.6	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	5	N	200	10.6	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	6	NNE	265	9.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	7	NNE	475	9.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	8	NE	300	12.1	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	9	NNE to E	50	23.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	10	E	<10	23.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	11	E	40	23.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	12	E	<10	23.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	13	ESE to SE	330	1.3	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	14	ESE	265	1.2	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	15	SE to S	300	1.3	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	16	SE to S	10	1.3	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	17	S	500	1	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		

Type / Source of Emission / Hazard	ID	Direction from Site	Dist from Site	% Freq Down-wind	Likelihood of Exposure	Unmitigated Risk	Mitigation Measures to be employed	Mitigated Risk
	18	S	<10	1	High – immediate receptor to water discharge	High – possible loss of traction to passing vehicles / dirt nuisance		
	19	S to SW	135	3.5	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	20	WSW	150	6.7	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	21	W to NW	<10	6.4	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	22	W	70	6.4	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	23	NW	260	2.9	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		
	24	NNW	200	6.1	N/A – receptor not exposed to flooding from Site	N/A – no receptor sensitivity		

6 Accident Management Plan

6.1 Potential Accidents of Concern

Accidental spillage of potentially hazardous substances through loss of containment is the primary environmental risk of concern that could be attributed to the activities at this site. This could result from collision between vehicles, collision or mechanical damage to the fuel tank, or damage to the process water treatment or storage tanks. The sections below identify:

- Potential sources and types of contaminating liquids
- How an accident may release those substances and the pathways they may take
- Which receptors will be at risk from any spillages
- What preventative or mitigation measures are in place to reduce or remove the impact to the environment.

6.2 Sources of Contamination

The types of potentially polluting liquids retained at site are as follows:

- Diesel fuel for the generator / site plant – high hazard potential
- Lubricating, brake or coolant fluids associated with site vehicles or other site plant - high hazard potential

Accident Scenarios

Failure of the fuel tank, fuel lines or components containing fuel due to damage incurred during an accident leaking onto site roads, open ground, quarry excavations or material stockpiles at site.

Failure of the brake, lubricating or coolant lines or components containing contaminating liquids due to damage incurred during an accident leaking onto site roads, open ground, quarry excavations or material stockpiles at site.

6.3 Spillage Pathways

The ground likely to be impacted by the pollution sources of concern will be the existing waste deposits and concrete hardstanding, or, non-hazardous, inert waste imported as part of the DfR activity. There is no exposed, undisturbed natural ground exposed at Site.

Liquids may seep into the underlying ground (surface spillages or leaks from buried pipework) or flow overland to topographical low points within the quarry void. Spillages on the ground may flow across impermeable strata (on the surface or subsurface) such as silt or clay and then seep into permeable ground at a location distant from the initial point of spillage. Spillages that enter the drainage scheme may enter the storm drain network.

6.4 Receptors

Contamination may reach groundwater located in permeable strata in the underlying Cadeby Dolostone Principal Aquifer. This is considered to be a high-risk receptor. The accompanying Groundwater Risk Assessment has however considered the presence of a preferential flow pathway

via the former tunnel that links the Site and the former quarry void now occupied by the adjacent landfill. It anticipates precipitation has historically entered the made ground within the Site and flowed via this tunnel (assumed to be backfilled) and the trackway is contained across the quarry floor to the south. This water may then have daylighted to the south of the landfill via another tunnel or a land drain. This land drain then likely discharges into the Frickley Beck 950 m to the south of Site.

6.5 Risk Assessment and Risk Minimisation

All vehicles will be subject to a strict preventative maintenance regime to ensure optimum performance and minimisation of accidental leaks of contaminating liquids. All plant will be subject to a visual inspection at the beginning and close of each day to identify any leaks or spills from the machine itself or on the ground where it has been parked or operating.

Where it is necessary for more than one vehicle to operate in the same area at once, particular care will be taken to prevent collision by use of appropriate signage, 2-way communications, work planning and oversight by the site manager. Where possible all vehicles will carry with them a spill kit or have easy, direct access to a spill kit at the site offices or be in close communications with site personnel who can deploy a spill kit in the event of an accident. Only vehicles authorised to operate in the Site will do so and be driven by competent, appropriately trained staff.

The surface water system once constructed will be inspected on a minimum daily basis for the presence of hydrocarbon or other liquid contamination. This may be evident by an oily sheen or unusual discoloration of the water. If identified passive discharge or pumping to that system must cease immediately until the cause can be established and addressed. Containment booms and adsorbent materials will be stored at a secure location in the Site in the event they need to be deployed at short notice when a spillage occurs or if one is identified. Any booms / absorbent materials used to contain a spillage will be disposed of at an off-site appropriately permitted facility.

6.6 Emergency Procedures

In the event of a collision or any kind of damage incurred to a vehicle or site plant, the vehicle will cease operation immediately. The safety / health of all persons involved is a priority and any emergency care will be administered first i.e. medical assistance, calling fire service to extinguish fire / free trapped individuals, call the police if criminal act is considered to be a factor.

When safe to do so the extent of any contamination will be assessed. In addition to any fuel or liquids spilt from the vehicles, the Operator may also need to manage contaminated water or other fire-fighting residues that may have accumulated. The vehicle or plant in question will remain in its location to prevent spreading the contamination elsewhere on site. If it is necessary to move the vehicle to make repairs or make the area safe, it should only be moved the minimum distance required and to a location where any further spillages can be satisfactorily contained. The vehicle should not be removed from site until all the contaminating liquids have been removed or the risk of further leaks has been minimised. This is to stop contamination of transport vehicles, roads or onward destinations.

If the incident has occurred near to the surface water system, any discharge to the system will be halted as soon as is safe to do so. This will prevent transmission of contamination to the storm sewer system.

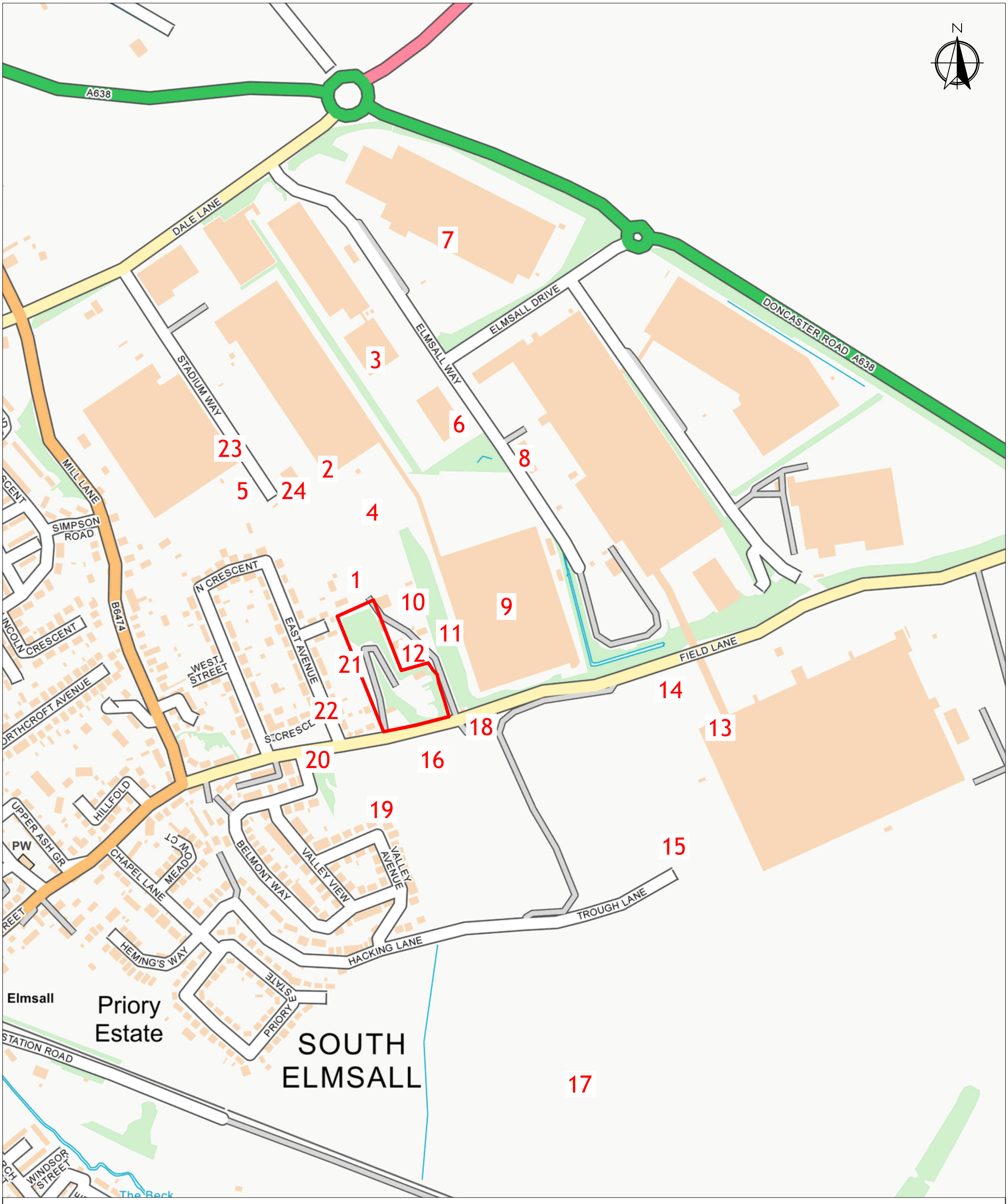
If safe to do so absorbent materials or containment booms will be deployed immediately to prevent liquids entering the lagoon or surrounding ground. It may also be appropriate to construct low bunds from on-site material to hold the liquid or direct it to a location when it can be more easily managed and removed.

Any contaminating liquids, absorbent material or contaminated ground must be removed from the site as a matter of urgency to prevent it spreading further or becoming increasingly difficult to manage. Any such material should be sent to an appropriately permitted facility for treatment or disposal. The condition of the ground and surface water management features in the location of any pollution incidents should be inspected and their decontamination independently verified before the activity recommences i.e. pumping of surface water.

It may be the case that a leak or damage is noted after the vehicle had transited from another area of site. The Operator must make a review of all locations the vehicle has been operation in since the issue had likely occurred and ensure contamination is not more widespread. If so, appropriate mitigation measures must also be engaged at those locations also.

If a hydrocarbon contamination is noted on any of the water bodies within the site, oil absorbent booms will be deployed to soak up the contaminant. Contamination of the banks of the water body may also have occurred and this will also require decontamination or removal and disposal of the surface layer.

APPENDIX A – Drawing referenced 2405-016/D/001: Receptors



Title:
Sensitive Receptor Location Plan

Proposed Permit Boundary

1 Receptor Location

Receptor name, Description, distance from Site and direction from Site detailed in Table 3, Section 4.2.7 of Hooper-Sargent Ltd Report referenced 2405-016/R/002

Client:
Wetherby Skip Services Ltd

HOOPER-SARGENT LIMITED
Environmental Permitting Consultancy

Project:
Field Lane Quarry Works

Drawing Ref:
2405-016/D/001

Scale@A3: 1:5000

Date: 07/06/24