H1 Risk Assessment (H1)

Document Ref: 203040/H1ERA

Table 1. Assessment of odour risks

Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Odour from imported waste. Fugitive emissions from: • Recovery (placement) activities • Storage of imported and recovered material	Residential properties 260 m to the north west of the site. Visitors to the Brockadale SSSI immediately north of the site. Visitors to the Timbertops Equestrian Centre People walking along the public footpaths in the SSSI and to the west of the site. Workers on site and in the commercial/ industrial buildings within the site boundary.	Nuisance and loss of amenity value	Atmospheric (fugitive). Air transport then inhalation.	Mild	Unlikely	Very Low	Imported materials will have a low odour potential (no municipal or waste with high organic content will be imported onto the site).	Controls on types of materials accepted. Recording of any complaints and implementation of controls as set out in the Operational Plan (203040/OP).	Very Low

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Table 2. Assessment of noise and vibration risks

Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Noise and vibration emissions from haulage (road deliveries) and placement of waste.	Residential properties 260 m to the north west of the site. Visitors to the Brockadale SSSI immediately north of the site. Visitors to the Timbertops Equestrian Centre People walking along the public footpaths in the SSSI and to the west of the site. Workers on site and in the commercial/ industrial buildings within the site boundary.	Levels of noise that cause loss of amenity and nuisance to users and residents in the locale. Disturbance to ecological species.	Airborne	Mild	Unlikely	Low	Adherence to agreed site operation hours. There will be no on-site processing of materials and activities will only comprise unloading of materials and placement. Only standard construction plant or machinery will be operated (no cooling equipment or fans will be used). No activities will take place at night. Vibration is not an issue at the site, as plant has no primary vibrating elements. Baseline noise levels from the surrounding commercial/ industrial buildings are in keeping with noise from operations.	All operatives inducted on the requirement to reduce noise emissions. All plant and vehicles will meet current guidance and will be maintained in line with manufacturer's requirements. Recording of any complaints and implementation of controls.	Low

Table 3. Assessment of fugitive emissions (other than odour)

Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
To Air									
Dust from vehicle operations from external haul roads. Dust from operations and handling of soil. Dust from importation and placement of soils.	Residential properties 260 m to the north west of the site. Visitors to the Brockadale SSSI immediately north of the site. Visitors to the Timbertops Equestrian Centre People walking along the public footpaths in the SSSI and to the west of the site. Workers on site and in the commercial/ industrial buildings within the site boundary.	Harm to human health, respiratory irritation and illness.	Air then inhalation.	Moderate	Possible	Medium	Permitted wastes include wastes with small particle sizes and potential to generate dust, especially during re-grading. Haulage, importation and recovery (placement) of soils and waste have the potential to generate dusts from off-site movements during prolonged dry periods.	Implementation of controls as set out in the Operational Plan (203040/OP).	Low
		Nuisance – deposit on cars, homes, clothing etc.	Air then deposition.	Mild	Possible	Low			
		Potential irritant, loss of habitat and damage to species.	Air then deposition in ditches / terrestrial habitats.	Mild	Possible	Low			

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Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
To Controlled Waters									
Run-off from site surfaces or spillages.	Drainage surrounding the site (drainage to ground). Surface water features within wider area (River Went)	Passive leaching to ground, from contamination or spillages on surface and directly entering the drainage system.	Land and drainage systems	Moderate	Possible	Medium	Waste material is being imported to site and without control may contain leachable contaminants. Permitted waste types do not include liquids, leachates or sludges and are unlikely to contaminate groundwater. Spillages of oils on to surface could enter the drainage network causing pollution. The bedrock geology is designated as a principal aquifer with high vulnerability. The site is not located within a Groundwater Source Protection Zone.	Controls as set out in the OP. Controls on types of materials accepted. Only acceptable fill material imported to the site. No oils or fuel to be stored on the site. Hazardous wastes or wastes in liquid form are not permitted. Drainage design to be in accordance with the Planning Permission.	Low
Run-off and infiltration from site surfaces or spillages (haulage and placement).	Drainage surrounding the site (drainage to ground). Surface water features within wider area (River Went)	Pollution to aquifer. Pollution due to sediment entrainment into waters, loss of habitat and damage to species.	Land infiltration through soils.	Moderate	Possible	Medium	Permitted waste types do not include liquids, leachates or sludges and are unlikely to contaminate groundwater. The bedrock geology is designated as a principal aquifer with high vulnerability. The site is not located within a Groundwater Source Protection Zone.	Only acceptable fill material will be imported on to the site. Hazardous wastes or wastes in liquid form are not permitted.	Low

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Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Fugitive emission of waste through entrainment in flood waters.	Local human population (as per odour). Priority habitat. Drainage surrounding the site (drainage to ground). Surface water features within the site and wider area (drains and ponds)	Nuisance, health implications and pollution/ contamination.	Flood waters	Moderate	Unlikely	Low	The site lies within Flood Zone 1 and thus at a very low risk of fluvial flooding.	Controls on types of materials accepted. Only acceptable engineering fill material will be imported on to the site. Permitted wastes/materials are at low risk from entrainment.	Very Low

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Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Mud and Litter									
Litter from storage areas and mud from site operation.	Local human population (as per odour). Local flora and fauna. Drainage network.	Nuisance, loss of amenity and reduced safety. Mud on road. Pollution to watercourses.	Air, land, mud on vehicles, runoff to ground.	Moderate	Possible	Medium	Permitted wastes have low litter potential. No municipal wastes accepted. Site will be accessed from a hard-standing haul road.	Controls as set out in the OP. Haulage routes will be inspected and maintained to keep free of mud. Road sweepers and scrapers will be operated on external and internal roads, where necessary. All visible litter on site boundaries will be cleared as soon as practicable. Inspection and corrective action regime will be undertaken in line with site management system.	Low
Pest and Vermin									
Storage of waste attracting pests and vermin.	Local human population (as per odour).	Can cause increased populations and infestations of rats, mice, flies and other vermin. Result is harm to health, loss of amenity and nuisance.	Air transport and overland.	Mild	Unlikely	Very Low	Permitted wastes have low organic content. No municipal waste. Very low potential to attract pests and vermin.	Management and control on wastes accepted. Inspection of site by Site Manager on frequent basis. Implementation of controls as required.	Very Low

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Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Ecological									
Damage to ecology (flora and fauna).	Brockadale SSSI European eel migratory route along the river to the north.	Destruction and/or damage to flora / fauna. Disturbance of invasive species leading to human health exposure.	Direct contact, over land and airborne.	Moderate	Possible	High	The SSSI contains areas of Deciduous Woodland, Lowland Calcareous Grassland and Good Quality Semi Improved Grassland.	All control measures and mitigation will be in accordance with the OP. Very little change will occur in the wider landscape.	Low

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Table 4. Accident risk assessment and management

Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Fire (accidental, arson) and smoke.	Local human population (as per odour) and environment. Local flora and fauna.	Damage and loss of amenity, property, nuisance and carcinogenic particulates.	Direct contact, airborne.	Severe	Unlikely	Medium	No fire or burning on-site is permitted. Permitted wastes have low combustion potential.	No wastes will be burned on-site. Site will be secured at all times during development. Access controlled during operational hours. In event of fire, controls specified in site Accident Management Plan (AMP) and Fire Brigade notified, as necessary. Incidents recorded in the Site Diary.	Low
Spillage of fuels, oils or polluting material. Fugitive release of VOC from storage activities.	Soil, surface water and groundwater. Local population. Local flora and fauna.	Pollution and/or contamination	Land and drainage systems	Moderate	Unlikely	Low	Only small-scale storage of fuel and oils for plant and machinery. No hazardous or liquid wastes will be accepted on site.	Site procedures include Accident Management Plan (AMP) and spillage controls. Spill kits stored with tanks and plant, and in the site office.	Low
Spillage of waste or recovered material.	Human health (as per odour). Surface water drainage.	Loss of amenity, nuisance, pollution and / or contamination.	Land, drainage systems and air	Moderate	Unlikely	Low	Uncontrolled release could cause health or pollution issues. No hazardous or liquid wastes will be accepted on site.	All vehicles accessing the site will be sheeted or fully enclosed. Unloading and loading will be controlled at all times. The Accident Management Plan will incorporate spillage of waste from vehicles in the event of a Road Traffic Accident. Incidents recorded in the Site Diary.	Low

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Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Direct physical contact between humans and wastes, machinery and vehicles.	Human health (site operatives and local population).	Bodily harm.	Direct contact	Severe	Unlikely	Medium	Permitted wastes do not have potential to cause risk to human health (no hazardous materials). No public access during works.	Activities to be managed in accordance with site health and safety management system. Access to wastes to be restricted to trained and competent personnel.	Low
Instability of proposed earthworks design causing subsistence / damage	Surrounding area, fauna / flora, end users	Bodily harm. Pollution to surrounding land. Loss of amenity, nuisance, pollution and / or contamination.	Land	Severe	Unlikely	High	Permitted wastes will be cohesive mineral / aggregate material and the risk of instability is considered low. The proposed design has been approved with the local Authority through a planning permission.	Proposed design in accordance with industry guidance principles and the Importation Protocol. Given the accepted waste types are limited to mineral / aggregate only, the risk of instability is not considered significant. .	Low

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Table 5. Assessment of ground gas risks

Hazard	Receptors	Harm	Pathway	Hazard Receptor Significance	Likelihood of Hazard Receptor Linkage	Magnitude	Justification	Risk Management	Residual Risk
Inhalation of ground gases generated by waste deposit beneath the proposed earthworks. Inhalation of ground gases generated by the inert soils from proposed earthworks. Inhalation of volatile vapours with elevated concentration of determinants. Explosive risk from bio-gas/ground gases Surcharging of eastern historical landfill deposit through deposition of inert material causing potential gas risk	On site land users (proposed recreational) Temporary construction staff.	Intoxication Explosion	Emissions from ground (through historical landfill waste and/or adjacent sand/gravels) to air.	Severe	Negligible	Very Low	The proposed import is of mineral wastes only. There are no organics to be imported. As such, no significant methane will be generated by the breakdown in the soils. Some CO_2 may develop within the imported fill due to microbial activity, but it will passively release from the soils and rapidly disperse. Any methane and CO_2 will passively release from the surface of the above ground deposit and not accumulate. The final land use is not at risk from gas emissions. Although the fill is within a quarry void, the majority of the fill has an open side façade with preferential pathway to open air within the restoration. The soils will not pose a risk to the recreational users of the site.	Waste acceptance procedures to ensure material is of low organic content. Waste acceptance procedures will be in accordance with the Importation Protocol. A quantitative risk assessment or monitoring is deemed necessary.	Very Low
	Off-site land users (Brockadale SSSI, users of footpaths and Equestrian Centre).	Intoxication Explosion	Emissions from ground building up within buildings	Severe	Negligible	Very Low	As above. The deposit is located below the wider ground level however as it's only stabilizing the side slope, it is an open air structure. Any gas generation is very unlikely. In the event it did migrate from the soils it could laterally or vertically	As above.	Very Low

							emerge from the ground and dissipate. There is no direct pathway for it to enter nearby properties and enclosures. Hence, there is no viable pathway and risk is negligible.		
	On site land users (proposed recreational) Temporary construction staff.	Intoxication Explosion	Emissions from ground causing land instability	Severe	Negligible	Very Low	Settlement occurs 6 to 12 months from completion of the reprofiling works. Further ongoing settlement and consolidation would be likely to be complete within 3 to 5 years, albeit at a significantly reduced rate. Any methane and CO2 will passively release from the surface of the above ground deposit and not accumulate. Works will be in accordance with an approved design and the operational plan. The operator will use well known earthworks compaction techniques.	As above.	Very Low