PARRY'S QUARRY LANDFILL, ALLTAMI, FLINTSHIRE

Environmental Permit Application

Environmental Risk Assessment

Prepared for: Mold Investments Limited

Client Ref: 416.07238.00001

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Mold Investments Limited (Mold) to prepare an Environmental Permit Application for the Parry's Quarry Landfill and associated Waste Transfer Station (WTS) under the Environmental Permitting (EP) (England and Wales) Regulations 2016.

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'* (May 2018)[1] which is also adopted by Natural Resources Wales (NRW). 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). The 1km offset has been assessed to support the requirements of the Fire Prevention and Mitigation Plan Guidance[2] (FPMP).

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 Installation Design Report (ESID) (SLR Ref: 416.07238.00001/ESID);
- Odour Management Plan (OMP) (SLR Ref: 416.07238.00001/OMP);
- Leachate Management Plan (LMP) (SLR Ref: 416.07238.00001/LMP);
- Noise Assessment Report (Ref: LE12936/005);
- Waste Acceptance Procedure (WAP) (SLR Ref: 416.07238.00001/WAP);

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit, accessed March 2018
[2] NRW Guidance Note 16 - Fire Prevention & Mitigation Plan Guidance – Waste Management, Version 2.0, August 2017.

- Operating Techniques and Management Plan (OTMP) (SLR Ref: 416.07238.00001/OTMP); and
- Fire Prevention and Mitigation Plan (SLR Ref: 416.07238.00001/FPMP).

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;
- Odour;
- Noise,
- Fugitive Emissions to Air, Water and Land; and
- Accidents.

As a result of this EP application, the amenity and accidents, odour, noise and fugitive emissions have been assessed based on the proposed activities included within Section 4 of this ERA. Site waste, global warming potential and the accident management plan are detailed in the OTMP included in Section 12 of this application.

3.0 Site Setting and Receptors

3.1 Site Setting

The site is situated within the existing Parry's Quarry in Alltami, Flintshire and bounded by the A494 to the south, A55 to the north and Pinfold Road to the west. The National Grid Reference (NGR) for the entrance to the site is SJ 27478 66278.

The remaining land use immediately surrounding the proposed site is predominately agricultural land, with scattered residential and commercial / industrial premises. Access to the site will be via Pinfold lane. The site's location is illustrated on Drawing ESID1, and the site layout on Drawing ESID2.

All surrounding land uses and receptors within 1km are identified on Drawing ESID3 and all cultural and natural heritage is illustrated on Drawing ESID4.

A summary of the site's immediate surrounding land uses is identified in Table 3-1 below.

Table 3-1: Surrounding Land Uses

Boundary	Description
North	Ewloe Wood House and commercial/industrial properties are located adjacent to the northern boundary beyond which lies the A55 and a service station (eastbound on the A55) including a petrol station, hotel and restaurant. Also, to the north of the site beyond the immediate surrounding is the residential conurbation of Northop Hall and the Northop Hall Country House Hotel. The outskirts of Northop Hall are located approximately 600m to the north.
East	To the east of the site is the westbound A55 Service Station, including an unnamed residential property, beyond which lies the A55 and agricultural land. The small town of Ewloe Green and the larger conurbation of Ewloe are located 550m and 1km respectively to the east.
South	Adjacent to the south of the site is an area of small woodland beyond which lies the A494. Beyond the A494 is a large building supply merchant and other commercial/industrial premises. The further surrounding land is predominately agricultural land with scattered residential buildings (farm houses) including Parrys Cottage and the Pottery Cottages. A further large commercial / industrial estate is located within 1km to the south. The south eastern edge of the site encompasses part of multi designated Buckley Claypits and Commons Site of Special Scientific Interest (SSSI) / Deeside and Buckley Newt Site Special Area of Conservation (SAC).
West	Pinfold Lane is located immediately to the west. A disused quarry is located off Pinfold Lane, beyond which lies predominately agricultural land and scattered residential/agricultural buildings, including Pinfold Cottage and Alltami House. The town of Alltami is located approximately 640m to the southwest. Also adjacent to the west and southwest of the site is numerous commercial/industrial premises.

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

3.1.1 Residential Properties

The closest residential properties and farms are detailed in Table 3-2 below:

Table 3-2: Residential Properties within 1km of the EP Boundary

Property Reference or Name	Direction from site	Approximate Distance from Boundary
Parrys Cottages	SE	20m
Pottery Cottages	SE	200m
Properties off Smithy Lane	SE	400m
Properties off A494	SE	550m
Unnamed property accessed via the service station	E	55m
The Box	N	80m
Ewloe House	N	120m
Pinfold House	NW	130m
Old Farm Cottages	N	360m
Penfold Cottage	NW	400m
Gell Farm	N	300m
Oak Farm	S	350m
Ewloe Green Farm	E	750m
Brook Park Farm	N	500m

3.1.2 Farm and Farm Buildings

There are several farms and associated farm buildings located within 1km of the site's boundary. The closest of these is Oaks Farm 260m south of the site.

3.1.3 Recreational Premises

One recreational facility has been identified within a 1km radius from the site's boundary. Approximately 850m to the north is the Northop Hall Bowling Club.

3.1.4 Industrial and Commercial Premises

There are numerous industrial and commercial properties surrounding the site as illustrated on Drawing ESID3.

The nearest industrial site is immediately to the north and consists of a truck depot, manufacturing and warehouse facilities.

Further commercial / industrial premises are located approximately 20m west of the EP boundary (including a council depot) and a mixed use commercial and industrial estate which consists of several building material supplier. To the south a manufacturing facility is located, approximately 75m from the site's boundary.

A disused quarry is located approximately 20m to the west.

3.1.5 Service Station

The westbound A55 Northop Services lies 20m from the site's eastern boundary whilst the eastbound A55 Northop Services are located 450m to the north.

3.1.6 Public Transport Network

The A494 (Mold Road) is located adjacent to the south and the A55 North Wales Expressway is located approximately 40m to the east. Pinfold Lane runs adjacent to the western boundary. The greater local road network is shown on Drawing ESID3.

3.1.7 Surface Water Features

There are numerous surface water features surrounding Parry's Quarry Landfill. The closest surface water feature is the Alltami Brook which is located approximately 250m to the west of the site's boundary at its closest point. The Alltami Brook converges with Wepre Brook approximately 700m to the north of the site.

3.1.8 Areas of Open Space, Woodland and Agricultural Land

The site is located within a semi-rural setting with agricultural land and open ground surrounding the site in all directions.

Adjacent to the south of the site's boundary is a small area of woodland.

The south eastern edge of the site encompasses part of multi designated Buckley Claypits and Commons SSSI / Deeside and Buckley Newt Site Special Area of Conservation.

3.2 Geology

Published mapping of the superficial geology (BGS (2019); as shown on Drawing ESID10) indicates that glacial till is present above bedrock across much of the area surrounding the site. However, superficial deposits are absent along the route of Alltami Brook where it is closets to the site (i.e. 250 m to the northeast). Elsewhere alluvium is present along the course of the brook to the south; and alluvium and glacio-fluvial (sand and gravel) deposits are present on both Alltami and Wepre brooks to the north. The mapping also shows that superficial deposits are absent from across much of the site; this is due to the development that has taken place

Published mapping of the bedrock geology (BGS (2019); as shown on Drawing ESID11) shows that the site is situated within an outcrop of Carboniferous aged Coal Measures strata (predominately comprising mudstones with sub-ordinate sandstones, siltstones and coal beds). The bedrock succession is complicated by local structural controls, which have created a series of fault bounded blocks in the area, resulting in various lithologies to locally become juxtaposed against each other. The local geological sequence at the site is summarised in Table 3-3 below.

Table 3-3: Generalised Local Stratigraphy

Group	Formation	Member	Rock types
Warwickshire Group	Etruria Formation	-	Mudstones with subordinate sandstones (generally lacking coal)
Pennine Coal Measures Group	Pennine Middle Coal Measures Formation	Hollin Rock Member (sandstone)	

Group	Formation	Member	Rock types
	Pennie Lower Coal Measures Formation		Mudstones with subordinate sandstones, siltstones and coal seams

Published geological mapping (BGS (2019); as shown on Drawing ESID11) indicates that sandstones of the Etruria Formation are present across the eastern two thirds of the site (and extend to the area immediately to the east); and mudstones, sandstones and conglomerates of the Etruria Formation are present across the western third of the site. The Middle Coal Measures are present at outcrop further to the west, including the Hollin Rock Member which is identified beyond a north-south faulted boundary (with an apparent 50 m downthrow) present close to the western boundary of the site. The Lower Coal Measures Formation is present ~50 m to the east of the site beyond another approximately north-south trending fault line.

3.3 Hydrogeology

3.3.1 Aquifer Characteristics

The Coal Measures and surrounding bedrock are classified as a Secondary A Aquifer. Jones *et al*[3]. (2000) describe how these strata are expected to behave as a multi-layered aquifer system in which lower permeability mudstones act as aquicludes between sandstone aquifer horizons. Both the mudstones and sandstones (which are well cemented) possess minimal primary porosity. Groundwater flows predominately occur within joints and fractures within the sandstone strata to depths of up to 250m bgl; transmission of groundwater will depend on how locally well connected these hydrogeological units are. Groundwater movement is considered likely to be limited as the hydraulic continuity of the aquifer is disrupted by the faulting which effectively splits the aquifer units into isolated blocks. No groundwater abstractions have been identified within 1 km of the site.

Historical coal mining within the Coal Measures occurred in the local area and mine workings are known to be present beneath the site. However, the depth of the seams that were worked (>150 m) suggest that they are unlikely to affect groundwater pathways at the site.

The superficial deposits (alluvium and glacio-fluvial) locally present along Alltami Brook and Wepre Brook are classified as Secondary A Aquifers. The Glacial Till is classified as unproductive strata.

3.3.2 Aquifer Properties

Two distinct ranges of hydraulic conductivity values have been identified from aquifer testing that has been performed at the site (TerraConsult[4], 2015). Values of $<10^{-6}$ m/s were deemed to be consistent with primary (rock matrix) permeability; and values in the order of 6×10^{-5} m/s were considered to represent the secondary permeability of the Coal Measures rock types (i.e. bulk flow via the fracture network).

3.3.3 Source Protection Zones

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

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[3] **Jones, H.K., Morris B.L., Cheney, C.S., Brewerton, L.J., Merrin, P.D., Lewis, M.A., MacDonald, A.M., Coleby, L.M., Talbot, J.C., McKenzie, A.A., Bird, M.J., Cunningham, J. and Robinson, V.K. 2000.** The physical properties of minor aquifers in England and Wales. British Geological Survey Technical Report WD/00/4, Environment Agency R&D Publication 68.

[4] **Terraconsult, 2015.** Parrys Quarry Landfill Site. Hydrogeological Risk Assessment. December 2015. Report: 2434-R05.

3.4 Hydrology

The site lies within the catchment area of the River Dee. The nearest water course to the site is Alltami Brook which is situated to the west of the site; flowing from south-west to north-east. At its closest point, the brook is c. 250 m to the north-west of the site; it converges with Wepre Brook c. 700 m to the north of the site.

Wepre Brook flows from west to the east and is a tributary to the River Dee which is located c. 4 km to the north-east of the site. New Inn Brook, another tributary to Wepre Brook, is present c. 900 m to the east of the site.

The NRW Development Advice Map[5] shows surface water features associated with previous quarrying activities that are no longer present. The mapping advises that there is a risk from surface water flooding in these areas, however, as the features have not been present since 2015, the site is considered to be classified as having a very low risk of flooding (typically 0.1% a year).

3.5 Ecology

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

- MAGIC Mapping Website[6];
- NRW Designated Sites Tool[7]; and
- Woodland Trust's Ancient Tree Inventory[8].

3.5.1 European/International Sites

Searches on the MAGIC website confirm that there are no Special Protection Areas (SPA) or RAMSAR sites within 2km of the site's proposed EP boundary.

Multi-Designated Site

An area of land located adjacent to the southern boundary of the site is designated as both a SAC and a SSSI. The SAC is known as the Deeside and Buckley Newt Site and the SSSI is known as the Buckley Claypits and Common. The reasons for these designations are detailed below:

- Deeside and Buckley Newt SAC supports a population of over 1000 adult great crested newts in 100 breeding ponds, a protected species under the Wildlife and Countryside Act 1981 and EC Habitats Directive 1994. The mixed mosaic of neutral and acid grasslands, lowland dry and wet heath and mature broad-leaved woodland provide the ideal habitat for various life stages of amphibians and other priority species. The SAC is primarily acidic oak woodland, dominated by Oak *Quercus spp*., Ash *Fraxinus excelsior* and Sycamore *Acer pseudoplatanus*.
- Buckley Claypits and Commons SSSI has been designated for its; assemblage of amphibian species (newts), Great Crested Newt population; and its mixed mosaic of habitats including marshy, acidic and neutral grassland with a variety of wet heath, tall herb and scrub which provides an ideal range of habitats for amphibians to forage, shelter and overwinter at all life stages.

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[5] Natural Resource Wales Development Advice Map: Long Term Flood Risk, https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk, accessed in July 2019

[6] Multi-Agency Information for the Countryside – Available at: http://www.magic.gov.uk, accessed January 2018.

[7] Natural Resource Wales Designated Sites Tool , Available at https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-of-land-and-seas/designated-sites/?lang=en, Accessed in June 2017

[8] Woodland Trust Ancient Tree Inventory - http://www.ancient-tree-hunt.org.uk/discoveries/interactivemap/, Accessed in June 2017

Sites of Special Scientific Interest

There are a further two SSSI's within 2km of the site. The Connahs Quay Ponds and Woodlands SSSI is situated north east of the site at an approximate distance of 760m, whilst Maes y Grug SSSI is located 950m to the west.

- Connahs Quay Ponds and Woodland SSSI has been designated for its assemblage of amphibian species (newts), Great Crested Newt population and semi-natural broadleaved woodland.
- Maes y Grug SSSI has been designated for its populations of Great Crested Newts and mosaic of habitats including broadleaved woodland, mixed grassland, scrub and a range of hedgerows and waterbodies.

3.5.2 Other Ecological Receptors

Searches on the MAGIC website have not identified any of the following ecological receptors within 2km of the permit boundary:

- Area of Outstanding Natural beauty (AONB);
- Registered Parks and Gardens;
- Local Nature Reserves;
- National Nature Reserves;
- Ancient Woodland;
- Biosphere Reserves; and
- National Parks.

3.6 Cultural and Heritage

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

- Listed Building: Greenbank Farm Farmhouse, 1.2km west; and
- Scheduled Monument: Site of Pinfold Lane Pottery, 740m south.

3.7 Identified Receptors

Tables 3-2, 3-4 and Drawings ESID3 and ESID4 identify the receptors which are considered to be potentially sensitive and could reasonably be affected by activities at the site.

Table 3-4: Identified Receptors

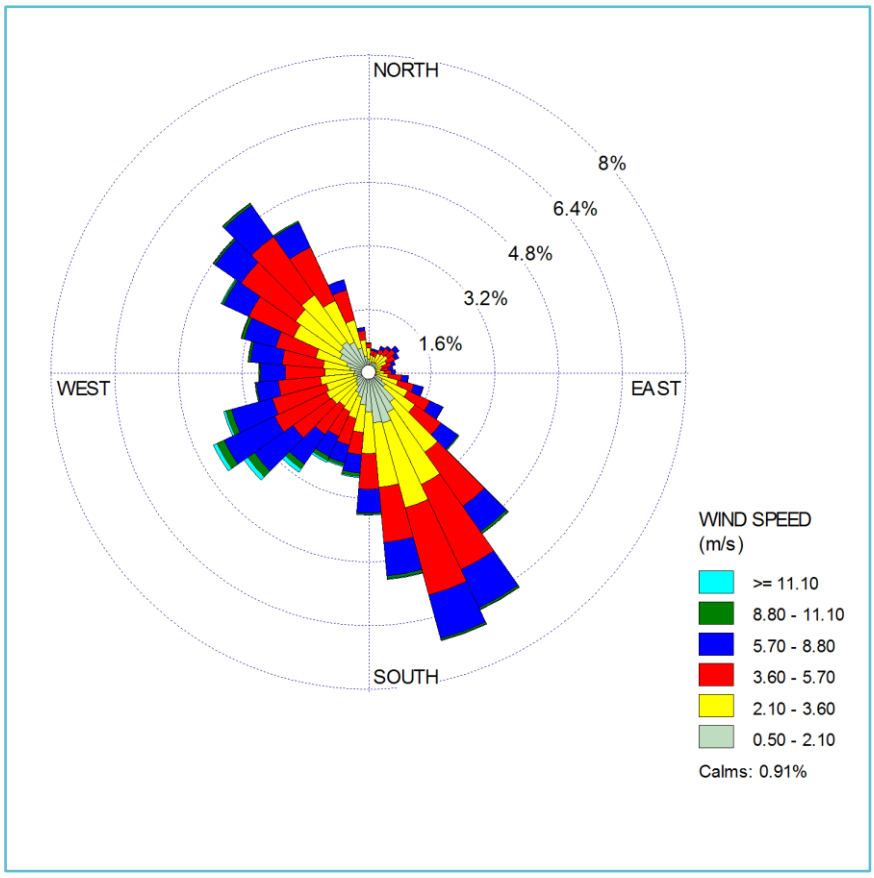
Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary (in metres)
Environmental Site Setting within 1km of the EP boundary as shown on Drawing ESID3			
A494	Public Transport Network	South	Adjacent
Pinfold Lane	Public Transport Network	West	Adjacent

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary (in metres)
Commercial properties including Deeside Truck Services	Commercial	North	Adjacent
Woodland	Woodland	South	Adjacent
A55 Northop Services including Costa Coffee, UK Diner, McDonalds, Shell and Holiday Inn	Service station	East	20
Disused Quarry	Industrial	West	20
Commercial/Industrial area including AH Plant Hire and Fire Doors	Commercial/Industrial	West	20
Flintshire County Council Offices and Depot	Council	West	20
A55 North Wales Expressway	Road Network	North, East	40
Thorncliffe Building Supplies	Commercial	South	75
Alltami Brook	Surface Water	Southwest, West, Northwest	250
Oaks Farm	Farm/Agricultural	South	260
Northop Services	Service Station	North	450
Werpe Brook	Surface Water	North	700
Northop Hall Bowling Club	Recreational	North	850
Cultural and Natural Heritage identified receptors located within 2km of the EP boundary as shown on Drawing ESID4			
Deeside and Buckley Newt SAC	SAC	South	Adjacent
Buckley Claypits and Commons SSSI	SSSI	South	Adjacent
Site of Pinfold Lane Pottery	Scheduled Monument	South	740
Connahs Quay Ponds and Woodlands SSSI	SSSI	Northeast	760
Maes y Grug SSSI	SSSI	West	950
Greenbank Farm Farmhouse	Listed Building	West	1200

3.8 Windrose

Five consecutive years of hourly-sequential observation data from Harwenden meteorological station, covering the period 2012 – 2016, inclusive, have been obtained and presented as a wind rose in Figure 3-1. The windrose shows that winds from the south eastern and north western quarters are more frequent and winds from the south west and north east least frequent.

Figure 3-1
Harwenden Meteorological Station – 2012 - 2016



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.

Table 4-1 Odour Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Landfill Operations: • The acceptance of biodegradable (not putrescible) waste; • The deposit of biodegradable waste at the tipping face in Phase 6; • Leachate Management – within sealed tanks; and • Landfill gas management. **Waste Transfer Operations:** • The acceptance, storage, treatment and transfer of biodegradable and	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Air.	The inert and non-hazardous non-biodegradable waste accepted on site, is unlikely to create odorous emissions. However, as the site is expected to accept biodegradable waste (although not putrescible) in Phase 6 and potentially at the WTS, an Odour Management Plan (OMP) (Ref; 416.07238.00001/OMP) has been prepared to mitigate and manage odour emissions at the landfill (in particular the tipping face) and the WTS. The OMP also includes mitigation and management measures to ensure that odour is not released from the landfill gas management system in place. All leachate extracted from the landfill will be transferred and stored within sealed and contained leachate tanks. The leachate will be then be transferred offsite for disposal. It is not proposed to store leachate within open lagoons on site. The OMP, is included as Section 10. The OMP contains the following elements: • An assessment of the risks of odour problems, from normal and abnormal situations, for example of weather,	Medium / High.	Odour nuisance, loss of amenity.	Low – due to detailed management and mitigation procedures will ensure odour is minimised during all operations at the facility.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
non-hazardous waste.			temperature, or breakdowns, as well as accident scenarios; • The appropriate controls (both physical and management) needed to manage those risks; • Suitable monitoring; • Actions, contingencies and responsibilities when problems arise; • Regular review of the effectiveness of odour control measures; and • Emission limits (where appropriate). The OMP demonstrates that the operator understands and accepts its responsibilities. In particular, it shows: • That the operator, either directly or through its contractors or subcontractors, will ensure that equipment on site is operated and maintained such that it is effective in the control of odour at all times; • That the operator will be familiar with the characteristics of the processes and equipment on site and have identified the areas of risk of emissions from odour;			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• How the operator will reduce or cease operations if necessary, to avoid serious odour pollution; • How the operator will engage with neighbours to minimise their concerns and complaints; and • How the operator will respond to complaints. The Site Manager will be responsible for implementing risk management measures in conjunction with the OMP and OTMP.			

Table 4-2 Noise Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Landfill Operations: • Loading and unloading of waste at the tipping face; • Engineering works; • Deposit of waste at the tipping face; • Landfill gas equipment; • Vehicle movements; and • Mobile plant/machinery. **Waste Transfer Operations:** • Vehicle movements; • Operation of fixed and mobile plant; and	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Air.	A Noise Assessment Report, Ref: LE12936/005, has been prepared by Wardell Armstrong and is included as Section 13 of this EP application. The assessment includes details of the noise surveys, noise data and an assessment of the results in accordance with current guidance including BS4142:2014. The assessment was conducted for initial site preparations, the landfilling operations, the WTS and subsequent restoration activities. The assessment concluded that noise from the site is predicted to be below the measured background noise level during daytime and night-time with the exception of site preparation activities at Parry's cottages south east of the site. However, predicted noise levels are only marginally above background noise levels and therefore specific mitigation measures are not required. Although mitigation measures are not required, the following operational measures will be employed on site to manage noise and vibration: • Liaison with neighbours (as and when required) to determine whether the facilities noise	Low – intermittent during the day.	Nuisance to local residential, commercial and industrial properties during delivery periods i.e. during the day.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
• Processing of waste.			emissions are at acceptable levels and not causing a nuisance; • Training of all appropriate installation personnel; • Noise sensitive engineering works; • Noise suppression equipment (if required); • Selection of noise sensitive plant and equipment; • Siting of plant and equipment in relation to sensitive receptors; • Maintenance of plant and equipment; • Possible alternatives to reversion alarms; • Physical sound barriers e.g. bunds; • 15mph speed limit across the site; • Designated vehicle routes away from sensitive receptors where possible; and • Regular road maintenance.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			In addition, the WTS building will benefit from roller action doors which will be kept closed when deliveries of waste are not taking place. All waste processing and storage will take place within the main building. The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			

Table 4-3 Fugitive Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air:						
Landfill Operations: • Waste deposit; • Waste surfaces; • Unrestored surfaces; • Vehicle movements; and • Dusty wastes. **Waste Transfer Operations:** • Dust from waste processing operations; • Dust from waste storage; and • Dust from vehicle movements.	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Air.	**Landfill Operations:** The following operational measures will be employed on site to manage the release of dust: • Vehicle speed limits; • Sweeping of access roads and adjacent highways; • Spraying of roads and operational areas; • Static water sprays; • Seeding of earth bunds, stockpiles and surfaces; • Containment of particularly dusty waste; • Fill direction and sequence considering meteorological conditions; and	Medium.	Nuisance and health risk to site visitors, residential, industrial/ commercial receptors.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• Sheeting of vehicles. The Site Manager will have the responsibility for ensuring that nuisances and hazards arising from the landfill due to dust are minimised. The following monitoring techniques will be employed on site to manage the release of dust: • Monitoring of meteorological conditions; • Daily visual monitoring; and • Any quantitative monitoring required by the EP. If significant volumes of dust are noted at the installation during routine visual monitoring, the following action will be taken: **Dust Generation during Vehicle Movements** • The Site Manager will aim to ensure that vehicles are obeying the speed limits; and • Additional road sweeping will be organised if required.			

			Dust Generation during Waste Emplacement and Covering • If a problem is caused by a particular waste type, this waste will cease to be accepted until a suitable method statement detailing how the waste is handled, has been prepared and implemented; and • If dust is caused by general compaction and covering operations, the area will be sprayed with water. **Waste Transfer Operations:** Waste will arrive within sheeted or enclosed vehicles if possible, to ensure no escape of dust during transit. The WTS building will benefit from roller action doors which will be kept closed when deliveries of waste are not taking place. All waste processing and storage will take place within the WTS building. A speed limit will be implemented on site to minimise the mobilisation of dust particles. All vehicles will be subject to a programme of planned preventative maintenance and maintained in accordance with the manufacturer's recommendations. Drop heights will be minimised to prevent emissions of dust. Site surfacing will be maintained in good condition to minimise the mobilisation of dust particles.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			Site operatives will carry out ongoing visual monitoring throughout working day to identify unacceptable dust levels. The site will be subject to periodic clean downs to minimise the build-up of dusty particles. Visual monitoring will be carried out by all members of the staff throughout their shift and any potential emissions of dust reported to the Site Manager. If dust becomes an issue, or complaints are received, an investigation to establish the cause will be undertaken and action taken accordingly, e.g. if the problem is caused by a particular waste type, cease accepting that waste until a suitable method statement detailing how the waste is handled, has been prepared and implemented. The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			
To Water						

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Landfill Operations: • Collection and management of leachate • Contaminated site run off.	Surface water and groundwater.	Land and surface water	An LMP, (Ref: 416.07238.00001/LMP) has been prepared as part of this EP application and is included as Section 11. The LMP describes how leachate will be managed across the site during both the operational and the post closure periods and includes the following information: • An outline description of the proposed landfill cells, their leachate collection point numbers and distribution; • An assessment of the likely volumes of leachate generation, over time, for all cells; • An assessment of the required operational maximum and long-term leachate abstraction rate from each cell and from the site as a whole; • An assessment and outline specification of the pumping systems required to achieve the abstraction rates required; • An assessment of the capacity of disposal arrangements available for	Medium	Contamination of surrounding surface water, land and groundwater.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			the site to accommodate the additional leachate generation volumes from the proposed cells; and • An outline of the management techniques that may be required to minimise the risk posed by leachate contained within the site of exceeding assessment limits or otherwise escaping from containment. The assessment and associated management techniques will ensure that there is a very low risk of any fugitive emissions to ground and surface water from the proposed landfill.			
Waste Transfer Operations: • Run off from inside the WTS building; • Run off from waste processing operations; and • Run off from waste storage operations.	Surface water and groundwater.	Land and surface water.	All waste will be stored and treated on impermeable surfacing within the main processing building. Due to the nature of the waste to be accepted and the proposed operations on site, there will be no contaminated run off generated under normal operating conditions. The WTS building will be fully bunded and able to contain any washdown runoff. Strict waste acceptance procedures will be in place to ensure that only approved waste materials will be accepted on site.	Low.	Contamination of surrounding surface water, land and groundwater.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			
Pests, Vermin and Insects						
• Uncompacted surface voids; • Uncovered wastes; and • Storage of wastes.	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Land and Air.	**Landfill Operations:** The site will not accept putrescible biodegradable waste, so therefore it is unlikely that pests will be attracted to the site. However, the following operational measures will be employed on site to manage birds, vermin and insects: • Robust waste assessment (detailed within the Waste Acceptance Procedure) combined with appropriate disposal and handling procedures; • Regular cleaning of waste storage areas (in the WTS building); • Storage of waste contained within the WTS building; • Daily pest and vermin inspections; • Daily covering of waste (at the operational tipping face);	Low - Medium.	Nuisance and loss of amenity and harm to human health.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• Removal of any ponding leachate; • Bird scaring; and • Trained and informed staff. The Site Manager will have responsibility for ensuring that nuisances and hazards arising from the landfill due to birds, vermin and insects are minimised. **Waste Transfer Operations:** All waste will be stored and treated on impermeable surfacing within the building. The main reception building benefits from roller action doors which will be kept closed when deliveries of waste are not taking place. Waste acceptance procedures will ensure that only authorised wastes are accepted. All waste stored and treated within the building will be subject to a quick turnaround (up to one week but likely to be 24 - 48 hours). In the unlikely event that birds, vermin or pests are identified on site, a specialist pest control contractor will be employed to undertake measures to remove the animals from the site.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			
Mud/Litter						
Mud; • Vehicle movements; and • Engineering works (relating to the operation of the landfill only)	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Tracked by vehicles arriving and leaving the site.	The following operational measures will be employed on site to manage the release of dirt and mud: • All access roads will be hard surfaced; • All vehicle will be driven through the wheel wash facility before exiting the facility; and • Routine road sweeping will be undertaken. It will be the responsibility of the Site Manager to ensure that nuisances and hazards arising from the landfill and the WTS due to the release of dirt and mud are minimised. The Site Manager will ensure that daily inspections are made of any access roads and the highway outside the entrance to the facility. In the event that mud, or dirt is found to be escaping over the site boundary the following action will be taken:	Medium	Road safety and litter nuisance.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• Investigations will be made of the cause of the problems; • Action will be prioritised according to the meteorological conditions and the location of sensitive receptors; • If appropriate, a road sweeper will be hired to sweep the access road, and the surrounding highway within 24 hours of the problem notification; and • Persistent misuse of the wheel cleaning equipment may lead to the vehicle being banned from using the facility.			
Litter; • Accumulations of litter; • Waste surfaces; • Waste deposit; and • Windblown wastes	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Air – windblown.	**Landfill Operations:** The following operational measures will be employed on site to manage litter: • Litter fencing; • Provision of cover materials; • Fill direction and sequence considering meteorological conditions;	Medium.	Nuisance and loss of amenity, impaired road safety.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• Sheeting of vehicles; • Cleaning of vehicles; • Sheltered emergency tipping area; • Efficient compaction of waste; • Daily covering of waste; • Mobile litter screens; • Construction of temporary banks and bunds; • Containment of high litter risk waste streams; and • Litter collection. The Site Manager has responsibility for ensuring that nuisances and hazards arising from the landfill due to litter are minimised. The following monitoring techniques will be employed on site to manage litter: • Monitoring of Meteorological Conditions; and • Daily inspection.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			Litter escaping from the deposition area but remaining within the installation boundary will be collected within 7 days and will be returned to the deposition area. In adverse weather conditions, the following actions will be considered: • Litter picking personnel could be deployed to collect litter within 24 hours of its escape from the facility; • Mobile litter fencing could be deployed to accommodate prevailing wind direction and location of receptors; • Operations could be transferred to the emergency landfilling area; and • The facility could be closed to selected waste or in extreme circumstances all waste inputs.			

Table 4-4 Accidents Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Spillage and Leakage	Local land quality, surface water and groundwater.	Runoff and percolation through ground	Tanks used for the storage of fuel and maintenance oil, will be constructed so that any leaks/spillages will be contained. Tanks will be surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest tank within the bund or 25% of the total tank volume within the bund, whichever is the greater. Storage tanks will be constructed to the appropriate British Standard. Tanks will be inspected visually on a daily basis by the site staff to ensure the continued integrity of the tanks and to identify the requirement for any remedial action. Minor spillages will be cleaned up immediately, using sand or proprietary absorbent to clean up liquids and placed in alternative containers. Materials suitable for absorbing and containing minor spillages will be maintained on site.	Low	Contamination of groundwater and surface water	Not significant

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			The site staff will undertake daily monitoring for evidence of spillage and leakage. Alongside regular visual inspections, the tanks will be fitted with level indicators to prevent overfilling. In the event of a major spillage immediate action will be taken to contain the spillage and prevent liquid from entering surface water drains and the unsurfaced ground. The spillage will be cleared immediately and placed in containers for off-site disposal and NRW will be notified. The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			
Fire	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Air transport of smoke, spillages and contaminated firewater by direct run off from site and via surface water drains.	**Landfill Operations:** Fire risks from landfill sites include: • Site buildings containing electrical appliances and other sources of ignition along with materials that would readily burn; • Combustible waste materials delivered to the facility which could support combustion;	Medium.	Harm and nuisance to local population, emergency services and site staff.	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			• Hot loads arriving on site; • Hot works; and • Underground fires, due to smouldering loads or spontaneous combustion. All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers, and emergency procedures. Smoking will only be permitted at designated areas and specifically not at the operational areas on the installation. Where appropriate, plant will be fitted with automated fire protection equipment. A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained prior to any hot work being carried out on installation plant and equipment. Waste acceptance procedures will minimise the likelihood of hot loads being deposited at the active face.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			All potentially hot loads will be identified on arrival at the installation and will be subject to quarantine procedures. The landfill gas management system will be monitored regularly and adjusted where necessary to ensure that air is not entering the system. Smoke and fire alarms will be fitted in the installation offices. All operatives will remain vigilant regarding the breakout of fire at the site, and the emergency procedure and action plan outlined below are followed if fire is observed. Monitoring for underground fires will be routinely carried out during the regular monitoring of the landfill gas management system. **Waste Transfer Operations:** A FP&MP (Ref: 416.07238.00001/FP&MP) has been prepared as part of this EP application and is included in Section 12, Appendix 01. All waste transfer operations will be carried out in accordance with the FP&MP.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Vandalism/unauthorised access causing loss of containment or fire.	Harm to Human Receptors, Ecological Receptors, Commercial/industrial receptors, Land and Water	Land, air.	Security on site will include: • Fencing along the site boundary; • Lighting; • A CCTV system; • A gate located at the entrance to the site, which will be locked when the site is closed; and • Lockable doors to all buildings on site. Security infrastructure will be inspected daily at the start of each shift by the operations staff to identify deterioration and damage and the need for any repairs. The WTS building will be maintained and repaired to ensure its continued integrity. If damage is sustained, repairs will be made by the end of the working day. If this is not possible, suitable measures will be taken to prevent any unauthorised access to the site and permanent repairs will be affected as soon as practicable.	Low.	Theft, Plant failure, harm to human health	Not significant.

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			All visitors to the site will be required to register in the visitor's book and sign out again on exit. This minimises the risk of unauthorised visitors being present at the site. The Site Manager will be responsible for implementing risk management measures in conjunction with the OTMP.			
Unauthorised Waste Acceptance	Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Via air (odours) Overland (to sewers, surface and groundwater)	A WAP (Ref: 416.07238.00001/WAP) has been prepared as part of this EP application and is included in Section 12, Appendix 02. In accordance with the WAP, waste will be subject to strict procedures to identify, reject and/or segregate potentially non-conforming waste. Only waste authorised by the permit will be accepted at the site. All wastes will be subject to inspection and checking against the declaration on the waste transfer note. In the event that unauthorised waste is delivered to the site, the waste will be segregated and stored in a designated quarantine area prior to export from site.	Low	Nuisance, harm to human health	Not significant

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk**
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			The Site Manager will be responsible for implementing risk management measures in line with the WAP.			
Flooding	Surface water, soils and groundwater. Receptors as identified in Table 3-4. See Drawings ESID3 and ESID4.	Flood waters over land.	The site is classified as having a very low risk of surface water flooding. The Site Manager will be responsible for implementing any required risk management measures in conjunction with the OTMP.	Low.	Contaminated flood waters may contaminate buildings and land.	Not significant.

5.0 Conclusion

This ERA has been undertaken as described by regulatory guidance issued by the EA[1] which is also adopted by NRW. The assessment is provided as part of the application for an environmental permit application for the Parry's Quarry Landfill and WTS.

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 OMP has been prepared in support of this ERA.

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