
THE ARLEY CONSULTING COMPANY LIMITED

Chorleian House
49-51 St Thomas's Road
Chorley, Lancashire, PR7 1JE

Tel: 01257 278300
Fax: 01257 268063
Email: mailbox@taccl.co.uk

Report No 17832/3A

June 2018

**ENVIRONMENTAL RISK ASSESSMENT
for
THE OUSEBURN TRIANGLE
SHEFFIELD**

Prepared for

**THE OUSEBURN TRIANGLE LIMITED
559 Carlisle Street East
Sheffield
S4 8DT**

TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Report Context	1
1.2	Site Details	2
1.3	Layout.....	3
1.4	Surrounding Land Use	3
2.	IDENTIFICATION OF RISKS.....	4
2.1	Activities and Waste Types.....	4
2.2	Identification of Receptors	4
2.3	Identification of Hazards.....	8
2.4	Baseline Conditions.....	8
3.	ASSESSMENT OF RISKS	11
3.1	Methodology	11
3.2	Assessment of Risks	11
4.	MITIGATION	15
4.1	Noise and Vibration	Error! Bookmark not defined.
4.2	Dust.....	15
4.3	Uncontained Run-off.....	16
4.4	Mud on the Road	16
4.5	Accidents.....	17
5.	CONCLUSIONS	19

LIST OF TABLES

- Table 1 - Acceptable Waste Types
- Table 2 - Location of Receptors
- Table 3 - Assessment of Risks from Dust
- Table 4 - Assessment of Risks from Uncontained Run-off
- Table 5 - Assessment of Risks from Mud on the Road
- Table 6 - Assessment of Accident Risks

LIST OF APPENDICES

- Appendix A - Air Quality Assessment
- Appendix B - Drawings

LIST OF DRAWINGS

- Drawing No 17832/01 - Site Location Plan
- Drawing No 17832/02A - Site Layout Plan
- Drawing No 17832/03A - Potential Receptors Plan

1. INTRODUCTION

1.1 Report Context

- 1.1.1 The Arley Consulting Company Limited (TACCL) has been commissioned by The Ouseburn Triangle Limited (TOTL) to prepare an environmental risk assessment to support a permit application for the deposit for recovery permit at 'Ouseburn Triangle' (also known as 'Nunnery Triangle' or 'Darnall Triangle'), Sheffield.
- 1.1.2 This report should be read in conjunction with the Environmental Setting and Site Design Report¹ (ESSD) and the Environment Management System² (EMS), both submitted in support of the permit application.
- 1.1.3 The proposed recovery site is located approximately 2km to the east of Sheffield City Centre and comprises an area of waste ground with a former railway cutting in the east of the site.
- 1.1.4 Outline planning permission has been granted by Sheffield City Council (SCC) for the erection of 100 dwellings requiring the infilling of the existing railway cutting, provision of new access, creation of public open space and establishment of an ecological and geological enhancement area.
- 1.1.5 As part of the development the eastern cutting will be infilled to enable the construction work. It is proposed to use inert construction, demolition and excavation waste as a direct substitute for primary aggregates.
- 1.1.6 A waste recovery plan³ was submitted to Environment Agency (EA) in December 2017 as pre-application to a bespoke permit application. The EA accepted that the proposed activity was 'recovery' in a letter from Alexander Child dated 19th January 2018.
- 1.1.7 This report addresses the risks presented by the recovery operation to amenity, surface water and ground water.

¹ TACCL, April 2018, Environmental Setting and Site Design for The Ouseburn Triangle, Sheffield (Report No 17832/4A)

² TACCL, April 2018, Environment Management System (Report No 17832/5)

³ TACCL, December 2017, Waste Recovery Plan for The Ouseburn Triangle, Sheffield (Report No 17832/1)

1.1.8 This report has been prepared following guidance available on the EA website, particularly:

- Risk Assessment for Your Environmental Permit⁴
- Risk Assessments for Specific Activities: Environmental Permits⁵
- Control & Monitor Emissions for your Environmental Permit⁶

1.2 Site Details

1.2.1 Ouseburn Triangle ('the site') covers an area of approximately 4.9 hectares and is located approximately 2 kilometres to the east of Sheffield City Centre and 500 metres to the south-east of Attercliffe district centre on Attercliffe Road.

1.2.2 The approximate National Grid Reference for the centre of the site is SK 38120 87980. The site location is shown on Drawing No 17832/01, which is contained in Appendix B.

1.2.3 Access to the site is at the south-east corner of the site via Kettlebridge Road close to the junction with Ouseburn Road.

1.2.4 The site forms a roughly triangular shaped parcel of land bordered by residential properties to the east and operational railway lines within deep cuttings to the south and west.

1.2.5 The site predominantly comprises overgrown scrubland. Abandoned railways cuttings are present along the north-eastern boundary and in the central portion of the site.

1.2.6 The southern boundary of the site is sloped with wooded areas.

1.2.7 Bridges are located beyond the site boundary in the western and eastern corners and a further one crosses the southern boundary.

1.2.8 The closest dwellings are immediately to the north-east on Hurworth Crescent which is the southern-most reach of a residential estate to the south of B6200 Staniforth Road.

⁴ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit> (accessed March 2018)

⁵ <https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits> (accessed March 2018)

⁶ <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>

1.3 Layout

- 1.3.1 The site entrance is located at the south-eastern point off Ouseburn Road. From here the operational area will be accessed via a hardcore site road.
- 1.3.2 The southern and western boundaries of the site are bound by palisade fencing. Brick wall and wooden fencing forms the majority of the eastern boundary adjacent to existing housing with the remainder comprising chain link fencing between the site and allotments. The entrance gate will be locked out of hours.
- 1.3.3 A self-contained office/welfare unit will be installed during the operational life of the site. Wheel cleaning facilities will be provided for waste vehicles leaving the site.
- 1.3.4 The layout of the site is shown on Drawing No 17832/02A, which is appended.

1.4 Surrounding Land Use

- 1.4.1 The site lies at the south-western reaches of Darnall ward. Surrounding land uses include the following:
- Residential
 - Commercial and Industrial units
 - Athletics & football facilities
 - RSPCA animal shelter
 - Allotments
 - Local Wildlife Site

2. IDENTIFICATION OF RISKS

2.1 Activities and Waste Types

2.1.1 The activity that this risk assessment applies to is the recovery of inert waste by deposit to land. The proposed waste types are those identified in current EA guidance⁷, as those acceptable at a recovery site without testing, other than for classification purposes

2.1.2 Proposed waste types are listed in Table 1 below.

Waste code	Description
01 01 02	Waste from non metalliferous excavation
01 04 08	Waste gravel and crushed rocks other than those containing dangerous substances
01 04 09	Waste sand and clays
10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks and ceramics
17 05 04	Soil and stones
19 12 09	Minerals (for example, sand, stones)
20 02 02	Soil and stones

Table 1: Acceptable Waste Types

2.2 Identification of Receptors

2.2.1 The location of the site in relation to potential receptors is shown on Drawing No 17832/03A, which is appended. This illustrates the position of identified receptors within 250 m of the site boundary. For the purpose of this risk assessment, receptors further than 250 m from the site boundary are not considered to be at risk from the activities. Potential receptors are summarised in Table 2.

⁷ <https://www.gov.uk/guidance/waste-acceptance-procedures-for-waste-recovery-on-land> (accessed April 2018)

Report No 17832/3A - June 2018
The Ouseburn Triangle, Sheffield: Environmental Risk Assessment

Receptor	Direction from Site	Distance from Site (m)
Domestic Dwellings		
Properties on Hurworth Crescent	E	adjacent
Properties on Ouse Rd, Nidd Rd, Ouseburn St	NE	40
Properties on Ouseburn Rd, Spofforth Rd, Myton Rd	ENE	adjacent
Industrial/Commercial Premises		
European Tyres Direct Limited, Ouse Rd	NE	85
Units to the West on Broad Oaks, Jessell St & Cottingham St	W	35
Units to the South on Parkway Ave, Kettlebridge Rd & Parkway Drive	S	45
Sheffield Council Depot	N	195
Restaurants on Staniforth Road	N/NE	100 (closest)
Convenience Stores on Staniforth Road	N/NE	120 (closest)
RSPCA Sheffield animal shelter	W	110
Public Amenity		
Ouse Road allotments	NE	adjacent
Ouseburn Road Local Open Space	NE	45
Kettlebridge Doorstep Green	E	30
Sheffield Hallam University Athletics Centre	W	200
Powerleague (football facilities)	W	60
Secondary School (Al-Huda Academy)	E	120
Noor al Hadi Mosque	NNW	125
Elahi Jame Masjid & Cultural Centre	NW	>250
Pakistan Muslim Centre	W	210
Grade II Listed		
Kettlebridge Nursery First School (now Al-Huda Academy)	NE	135
Caretakers House & Gateways at Kettlebridge Nursery First School	NE	125
Railings & Gates at Kettlebridge Nursery First School	NE	85
Highway or Minor Road		
B6200 Staniforth Road	NNW - NE	80
Ouse Rd, Nidd Rd & Closes	NE	28
Ouseburn Rd, Ribston Rd & Closes	ENE	Adjacent to entrance
Swarcliffe Rd	NNE	120
Broad Oaks, Stadium Way, Essell St, Cottingham St & Woodbourn Rd	W	46
Parkway Ave, Ketteridge Rd & Parkway Drive	S	40
Railways		
Sheffield to Rotherham Line	W	<10
Sheffield to Worksop Line	S	<10
Controlled Waters		
Pond (associated with Hydroponics business)	E	130
Geological Receptors		
Geological Features on site	-	-
Ecological Receptors		
Nunnery Triangle (Local Wildlife Site)	-	-

Table 2: Location of Receptors

- 2.2.2 The closest residential properties are immediately adjacent to the eastern site boundary on Hurworth Crescent, which is the southern-most reach of a residential area in Darnall. Within the residential area there are several places of worship, restaurants and a variety of local shops.
- 2.2.3 Commercial and industrial developments are located to the south and west of the site, including the 'Parkway Works' approximately 100 metres to the south of site beyond the railway line. A tyre fitting business is located 85 m to the north-east of the site beyond Hurworth Crescent.
- 2.2.4 Sheffield Hallam University Athletics Centre and Powerleague, which provides football facilities, are located approximately 70 metres to the west of the site.
- 2.2.5 The RSPCA Sheffield Animal Shelter is located approximately 110 metres to the west of the site. The Centre provides animal housing, veterinary facilities and allows limited public access.
- 2.2.6 Sheffield Council Staniforth Road Depot is located approximately 195 metres to the north of the site. This includes vehicle storage and maintenance facilities.
- 2.2.7 According to the Conservation (Natural Habitats) Regulations 1994 (referred to as '*the Habitats Regulations*') an assessment is required if the site lies within 2 km of a designated European Site.
- 2.2.8 There are no European Sites within 2 km of the site.
- 2.2.9 The closest SSSIs are Neepsend Brickworks (SSSI) and Neepsend Railway Cutting (SSSI) some 2.8 km and 3.4 km, respectively, to the WNW of the site. Both are sites of geological interest.
- 2.2.10 Salmon Pastures Local Natures Reserve (LNR), approximately 750 metres to the west-northwest, is a small, urban reserve that is an important part of Sheffield's green corridor. The former industrial site now provides habitats for several bird and invertebrate species.
- 2.2.11 Bowden Housteads Wood and Carbrook Ravine, some 1.5 kilometres to the southeast, form a LNR which includes ancient woodland and a variety of habitats.
- 2.2.12 Ouseburn Road 'Local Open Space' is located approximately 45 m to the north-east of the site and Kettlebridge 'Doorstep Green' is approximately 30 metres east-north-east of the south-east corner of the site. These are community greenspace and recreation areas.

- 2.2.13 Approximately 300 metres to the north of the site boundary there is an area designated within the Priority Habitat Inventory (England) as 'Deciduous Woodland', part of which is also identified for 'Woodland Improvement' under habitat-related Country Stewardship targets. This area is to the north of the Sheffield Council Depot and incorporates the banks of the canal.
- 2.2.14 The site is within the 'South Yorkshire Forest', an area designated for regeneration of urban greenspaces under the Community Forest initiative, in partnership with the Countryside Agency and the Forestry Commission.
- 2.2.15 The Sheffield and Tinsley Canal runs from east to west approximately 330 metres to the north of the site.
- 2.2.16 A pond associated with GroWell Hydroponics Sheffield is located approximately 130 m to the east.
- 2.2.17 There is a group of three listed 'buildings' in proximity of the site. The 'Kettlebridge Nursery First School', now an academy school, the 'Gate and Railings of Kettlebridge Nursery First School' and the 'Caretaker's House and Gateways at Kettlebridge Nursery First School' are all located within approximately 150 metres of the site.
- 2.2.18 Railway lines run along the southern and western boundaries of the site. Tram lines run in a north-south direction, parallel to Woodbourn Road, approximately 320 metres to the west of the site boundary. The A57 road, the 'Sheffield Parkway, is located to the southwest of the site boundary, approximately 400 metres away at the closest point. Roads in the immediate vicinity of the site are typically unclassified local roads, with the exception of Staniforth Road, which is designated as the B6200, running northwest-southeast with the closest point being approximately 80 metres to the north of the site boundary.
- 2.2.19 The site is registered as a Regionally Important Geological Site under RIGS 300 and 301. This is a non-statutory designation that aims to recognise and protect important earth science and landscape features. Geological features are being recorded and retained in accordance with planning conditions.
- 2.2.20 The site comprises a Local Wildlife Site known as the Nunnery Triangle which will be partially retained to the south of the site. This is a non-statutory designation that was considered within the planning decision.
- 2.2.21 The site is not situated in a groundwater source protection zone. The underlying Coal Measures strata are defined as a 'Secondary A' aquifer with 'high' vulnerability by the EA.

2.3 Identification of Hazards

2.3.1 Potential hazards from operation of the recovery site have been identified as:

- Noise and Vibration -traffic moving in and out of the site and a bulldozer to push out deposited material;
- Dust - generated in dry conditions from tipping, deposited material and site roads;
- Mud on the road - deposited on the access road and the public highway by outgoing vehicles;
- Accidents: contamination of land and groundwater - although the operation involves the importation of inert material there is a risk that unsuitable material may be brought onto site. This material may contain contaminants that can leach from the waste into the underlying groundwater or run-off to adjacent land;
- Uncontained run-off - surface water run-off which may contain suspended solids, increasing the sediment load in the receiving watercourse.

2.3.2 The inert nature of wastes disposed at the site will result in negligible generation of odour due to the lack of biodegradable and/or odorous material. As a result, odour is not considered further in this risk assessment.

2.3.3 Likewise, the wastes will not generate litter or attract birds, vermin or insects. Therefore, these potential hazards are not identified as present at this site and are not considered further in this risk assessment.

2.3.4 The operation is not considered to pose a risk to air (excepting dust) due to the nature of waste materials that are accepted; there are no additional emissions from site operations which would contribute global warming gases other than vehicle exhaust emissions.

2.4 Baseline Conditions

Wind Direction

2.4.1 For the risks in which the atmosphere provides the pathway, meteorological conditions will affect the dispersion rate, particularly with respect to dust. For the purposes of this risk assessment assumptions have been made in respect of the effect of the local topography on wind speed.

- 2.4.2 Information relating to wind speeds and direction for the meteorological station at Robin Hood Airport, approximately 30 km north-east of the site, were obtained by SLR Consulting Limited as part of the Air Quality Assessment⁸ (AQA) and is referred to in this risk assessment. The SLR AQA including the rose data is contained in Appendix A.
- 2.4.3 The wind rose data shows that wind blows predominantly (approximately 50% of the time) from the south and west. Wind speeds vary from these directions from up to 5 m/s (1 - 10 knots - calm to gentle breeze on the Beaufort Scale) to speeds of up to 11 m/s (21 knots - fresh breeze on the Beaufort Scale), and with occasional (<3% of the time) gusts of up to 18 m/s (35 knots - gale).
- 2.4.4 With reference to the data it is considered that wind direction at The Ouseburn Triangle will prevail towards the north-north-east and east, ie in the direction of the closest residential properties.
- 2.4.5 The critical wind speed at which most mineral dusts become airborne is 5.6 m/s. This value equates to Moderate Breeze - 'raises dust and loose paper' - on the Beaufort Scale. For approximately 37% of the time the local winds, in all directions, are below this critical wind speed.
- 2.4.6 Winds, when blowing from the west and south-west, ie towards the closest receptors, exceed the 5.6 m/s marker, which promotes generation of dust, during approximately 28% of that time (ie 14% of total time).

Rainfall

- 2.4.7 Potential dust emissions will be reduced during low wind periods and rainy/wet days. Based on data viewed on the Met Office website⁹ for Sheffield, the nearest climate station to the site, on average there are 130 wet or rainy days per year. Therefore, dust emissions are suppressed for approximately 36% of days and the ground may remain wet for subsequent days. This information is appended to the ESSD.

Noise

- 2.4.10 A Noise and Vibration Management Plan¹⁰ has been prepared by TACCL which details the risks from noise and the mitigation required.

⁸ SLR, November 2016, Air Quality Assessment, The Ouseburn Triangle Ltd (Report No 410.06579.00001)

⁹ www.metoffice.gov.uk

¹⁰ TACCL, June 2018, Noise and Vibration Management Plan for The Ouseburn Triangle, Sheffield (Report No 17832/6)

Water Quality

- 2.4.10 The Catchment Data Explorer¹¹ shows the site located within the River Don catchment, specifically the 'Don from River Loxley confl to River Don Works'. This catchment is described as 'heavily modified' and the water quality is reported as 'poor' based on 2016 data, the most recently available.

Air Quality

- 2.4.11 The site lies within Sheffield Citywide AQMA, which considers the particulate matter PM₁₀ and nitrogen dioxide NO₂ as declared pollutants.
- 2.4.12 The AQA⁸, prepared by SLR for the planning application, considered the construction and operational phases of the development. The assessment predicts a 'neutral impact/insignificant effect' from road vehicle exhaust emissions, and that the impacts from dust generation are considered to be 'not significant', assuming appropriate mitigation measures are implemented.

Potential for Flooding

- 2.4.13 The Ouseburn Triangle is in Flood Zone 1, an area with a low probability of flooding. EA guidance advises that a flood risk assessment may be required if a development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems.
- 2.4.14 A Flood Risk Assessment was undertaken by EWE Associates Limited¹² and submitted with the planning application and appended to the Waste Recovery Plan.¹³ This report established that there is limited potential for groundwater and surface water flooding.

¹¹ <http://environment.data.gov.uk/catchment-planning/WaterBody/GB104027057412> (accessed April 2018)

¹² EWE Associates Ltd, January 2017, Flood Risk Assessment (Report No 2016/2057 Rev A)

¹³ TACCL, December 2017, Waste Recovery Plan for The Ouseburn Triangle (Report No 17832/01)

3. ASSESSMENT OF RISKS

3.1 Methodology

3.1.1 Overall risk is a combination of the severity of an event and the likelihood that it will occur. Probability of occurrence is designated as:

- Probable – expected to occur based on previous occurrences
- Likely – expected to occur due to proposed changes
- Possible – this may occur, it may or may not have happened occasionally in the past
- Unlikely – not expected to occur
- Very Unlikely – has never and is not expected to occur.

3.1.2 The magnitude of risk is determined by the probability of exposure and the severity of the consequences, whereby:

- High – severe and long lasting environmental effects to the wider locality
- Medium – effects to the local environment and community
- Low - minor, short lived effects just beyond the site boundary
- Negligible – no discernible effect beyond the site boundary

3.1.3 An event could have a high probability of occurring but have minor environmental consequences; therefore it will be designated as a low risk. Likewise a risk with severe consequences could be unlikely to occur and will be designated as a low risk. A high risk designation would be assigned to an event that has severe consequences and is expected to occur.

3.2 Assessment of Risks

3.2.1 Risks to receptors from hazards identified in Section 2 have been assessed, following a source-pathway-receptor approach. The assessment takes account of baseline conditions and indicates where mitigation is required. Risks assessed as medium or high will require mitigation and control. These are presented in Tables 3 to 6.

Report No 17832/3A - June 2018
The Ouseburn Triangle: Environmental Risk Assessment

Hazard	Receptor	Pathway	Consequence	Probability of Exposure	Risk	Risk Management	Mitigated Risk
Windblown dust from vehicle movements, placement, spreading and compaction of waste	Sensitive receptors adjacent to eastern boundary: residents/ users of allotments & open spaces/employees at tyre fitting business	During dry conditions windblown dust deposited on cars and properties: Wind rose data in Appendix A shows prevailing wind blows towards closest residential receptors & away from bulk of commercial /industrial units	Nuisance: airborne dust/ deposit of dust on vehicles & Property Health: dust in locality due to dispersion possibly causing respiratory effects	Likely: due to proximity & direction of residential properties/ allotments /tyre business from site. Depth of intervening cutting & wall/fencing will afford some screening	Medium	Measures in place to minimise any particulate matter escaping beyond the permit boundary are set out in EMS document. These include: <ul style="list-style-type: none"> • Area around site entrance to be inspected during periods of dry weather and road sweeper in regular use; • Bowser employed to damp down as necessary to keep dust generation to a minimum; • 10 mph speed limit on access & site roads; • Emplacement operations to be suspended during high winds &/or unfavourable wind direction; • Operational surface area to be kept to a minimum. Materials drop height to be kept to a minimum. 	Low
	Employees at neighbouring commercial/industrial units	Unlikely for majority of commercial/industrial units: due to distance & direction from site plus screening afforded by intervening vegetation. Possible for units located approximately 80 m to ESE of site entrance: due to proximity	Low	Very Low			
	Surface water: Pond associated with hydroponics business	Airborne dust deposited on surface water	Increased solids and thereby sediment in surface water	Possible: feature is approximately 130 m to the ESE of the site entrance in the direction of occasional winds. Screening afforded by stone walls & vegetation.	Low		Very Low
	Train Driver	Windblown dust	Nuisance: airborne dust causing poor visibility	Possible: due to proximity as operations progress close to northern point of site. Unlikely due to wind direction when operations closer to eastern boundary	Medium		Low
	Ecological-geological Enhancement Area (Local Wildlife Site)	Windblown dust	Nuisance: airborne dust/ deposit of dust within LWS	Possible: due to proximity to recovery operation. Unlikely due to protection afforded by topography and direction of prevailing wind	Low		Very Low

Table 3: Assessment of Risks from Dust

Report No 17832/3A - June 2018
The Ouseburn Triangle: Environmental Risk Assessment

Hazard	Receptor	Pathway	Consequence	Probability of Exposure	Risk	Risk Management	Mitigated Risk
Surface water run-off carrying sediment	Land beyond boundaries	Surface water run-off during periods of heavy rain carrying suspended solids exits site overland due to changing contours as operations proceed	Pollution of adjacent land with sediment laden run-off	Possible	Medium	Surface water management plan to be agreed in accordance with planning conditions.	Low

Table 4: Assessment of Risks from Uncontained Run-off

Hazard	Receptor	Pathway	Consequence	Probability of Exposure	Risk	Risk Management	Mitigated Risk
Mud on the road	Ribston Road OR Ouseburn Croft/Ouseburn Road	Material carried on vehicle wheels and axles on leaving the site.	Mud carried onto public highway which could be a skid hazard for motorists.	Possible	Medium	Measures in place to minimise the deposit of mud on public roads beyond the permit boundary are set out in EMS document including: <ul style="list-style-type: none"> • Wheel cleaning facility • Employment of a road sweeper 	Low

Table 5: Assessment of Risks from Mud on the Road

Report No 17832/3A - June 2018
The Ouseburn Triangle: Environmental Risk Assessment

Hazard	Receptor	Pathway	Consequence	Probability of Exposure	Risk	Risk Management	Overall Risk
Non-compliant waste types, eg hazardous waste	Closest residents	Air	Inhalation of contaminated dust by locals	Unlikely	Low	<ul style="list-style-type: none"> Waste acceptance controls & pre-acceptance procedures will prevent acceptance of non-compliant waste types In the event that non-conforming waste is unloaded the waste will be consigned to a quarantine area to await re-loading & removal off-site 	Low
	Surface water, groundwater	Air & settlement &/or run-off	Contamination of controlled waters				
Leakage from container used to store non-compliant waste in the quarantine area	Surface water run off/ groundwater	Rainfall onto contaminated waste causing leachate to seep from container and into surface water system	Small scale contamination of land	Possible	Medium	Quarantine procedure as set out in Waste Acceptance Procedure in EMS document including: <ul style="list-style-type: none"> instruction to cover containers stored in the quarantine area to prevent infiltration and run-off removal of waste from site as soon as possible 	Low
Spillage or leakage of fuel, oils & coolants Minor (< 5 litres) Major (> 5 litres)	Underlying ground and groundwater; surface water run-off	Oil or fuel seeps into ground and contaminates groundwater	Localised contamination of ground, possible percolation into groundwater over a long period.	Unlikely as no fuel or chemical storage on site; fuel etc will be supplied by mobile sources	Low	Measures in place to minimise the occurrence of, & to manage, accidental leakage & spillage are set out in EMS document	Low

Table 6: Assessment of Accident Risks

4. MITIGATION

4.0.1 Risks assessed as medium or high will require mitigation and control. The proposed measures, outlined in Tables 3 to 6 above, are presented in detail below.

4.1 Dust

4.1.1 Dust generation is considered to be a low to medium risk. It is medium risk to local residents, users of the allotments and closest community open spaces, and employees of the tyre fitting business due to proximity and wind direction.

4.1.2 There is low risk to the majority of surrounding commercial/industrial owing to their distance and direction from the site and/or the screening afforded by intervening vegetation.

4.1.3 Similarly, dust is considered low risk to the units and pond located east-south-east of the site entrance which are in the direction of occasional winds but have screening afforded by the stone wall adjacent to the railway track and intervening vegetation.

4.1.4 There is a low risk from dust to the ecological-ecological enhancement area, due to the prevailing wind direction, which shows the waste activity predominantly down wind of the area. The enhancement area is located in a disused rail cutting which also affords some protection due to the lower topography relative to the central part of the site providing screening from the waste placement area.

4.1.5 The risk of airborne dust interfering with train driver visibility has been assessed as medium due to the proximity of operations to the railway line as they approach close to the northern and south-eastern point of the site. During unfavourable winds waste deposit will be suspended in this area. This risk will be reduced as operations progress closer to the eastern boundary.

4.1.6 The distance travelled by dust emissions will depend on particle size: the smaller dust particles will tend to stay airborne for longer and disperse over a wider area; coarser dust particles which cause nuisance (>30 µm) will mainly be deposited within 100 m of the source; intermediate particles (10 - 30 µm) between 250 and 500 m; while fine particles (<10 µm) may travel up to 1 km. Strong and turbulent winds may also keep larger particles airborne for longer.

4.1.7 Information relating to wind speed and direction has been obtained from the Robin Hood Meteorological Station for 2015. This shows prevailing wind to be spread from the west, south-west to the south.

4.1.8 To mitigate against dust generation the following actions have been incorporated into the EMS:

- Site access road to be inspected during periods of dry weather and when required will be damped down using a bowser to keep dust generation to a minimum;
- A maximum speed limit of 10 mph is set for vehicles on the access road and operational areas will be imposed on all site traffic to help reduce dust generation;
- Tipping will be suspended during high or unfavourable winds;
- Operational tipping surface area to be kept to a minimum.

4.2 Uncontained Run-off

4.2.1 Risks to land beyond the site boundary from increased sediment in uncontained run-off are designated as low.

4.2.2 Currently, the site is a depression in the landscape with a centrally located elevated plateau. There is no evidence of surface water on site indicating that rain percolates naturally through the strata and/or via existing drainage associated with the railway cuttings.

4.2.3 Once waste deposit operations commence and contours of the site change surface water run-off may be diverted towards the boundaries.

4.2.4 A Surface Water Drainage Design and Strategy is to be submitted to the Planning Authority for their approval, in accordance with Pre-commencement Conditions 12 and 13 of the planning permission. This is expected to include additional surface water management measures that will be incorporated into the EMS.

4.3 Mud on the Road

4.3.1 The deposit of mud onto public highways from HGVs entering and exiting the site is designated as a medium risk and mitigation controls are required to reduce the risk.

4.3.2 The following controls have been incorporated into the EMS:

- The site access and environs will be inspected regularly & a road sweeper employed as necessary;
- All vehicles exiting the site must do so through the wheel cleaning facility;
- All necessary mechanical plant to be stored on site rather than tracking on and off site daily.

4.4 Accidents

Acceptance of Non-inert Waste

- 4.4.1 Acceptable waste types will be restricted to those classified as 'inert' and the types listed in Table 1. However, it is possible that non-inert materials may be accepted inadvertently due to an error in the duty of care chain.
- 4.4.2 The risk of this occurring is determined as low and mitigating measures have been incorporated into the EMS most specifically in the Waste Acceptance Procedure (WAP). The WAP includes pre-acceptance, and on-site acceptance and verification requirements.
- 4.4.3 Waste enquiries will be made using a Basic Waste Characterisation Form and assessed for suitability under the supervision of the QEHS Director.
- 4.4.4 On arrival, the waste is visually inspected (where practicable) to ensure obvious non-compliant waste is not accepted and again upon tipping to ensure that it conforms to its description.
- 4.4.5 Operatives will inspect the waste during deposit. If any unacceptable waste is discovered it will be dealt with in accordance with the procedure for rejection outlined in the WAP.
- 4.4.6 The combination of pre-acceptance checks, on-site inspection and verification checks are considered the best practicable measures to prevent accidental acceptance of non-inert waste to reduce the risk to a satisfactory level.
- 4.4.7 The risk of leakage occurring from a container used to store non-compliant waste in the quarantine area has been assessed as medium. A quarantine procedure is outlined in the EMS with instruction to cover contaminated quarantined loads to prevent infiltration and run-off, and to expedite the removal of quarantined waste from the site as soon as possible.

Spillage or Leakage of Oil and Fuel

- 4.4.8 Small scale spillage or leakage of fuel or oil (< 5 litres) is low risk as it will have a minor effect, however a larger scale oil spill could have a wider, more prolonged environmental effect. As no fuel or chemicals will be stored on site owing to vehicles being re-fuelled by mobile sources the overall risk has been classed as low. Notwithstanding, the EMS identifies potential risks and outlines emergency procedures for minor spillages.
- 4.4.9 Vehicles and plant under the operators control will be subject to a preventative maintenance procedure to reduce the risk of minor leaks and spills from plant on the operational area. In addition site operatives carry out daily checks on their equipment or vehicle at the beginning of each day to check for leaks.

5. CONCLUSIONS

- 5.1 The predominant hazards associated with the proposed operation are noise and vibration, dust, mud on the road, surface water run-off and accidents including importation of non-conforming waste types.
- 5.2 Risks from these hazards were assessed and those designated as medium risk or above require mitigation. Risks from noise, dust, mud on the road and accidents were determined as 'medium' and require mitigation. All other risks were determined to be low or very low.
- 5.3 Mitigation measures are proposed to be implemented through the EMS.
- 5.4 All mitigated risks were determined to be low or very low.
- 5.5 In conclusion, it is considered that the operations on site will have minimal residual impact on the surrounding environment.

Judith Green
BSc (Hons)
Senior Consultant

C Gettinby
PhD BSc (Hons) MCIWM
Director

Appendices Supplied Separately

THE ARLEY CONSULTING COMPANY LIMITED

**Chorleian House
49-51 St Thomas's Road
Chorley, Lancashire, PR7 1JE**

**Tel: 01257 278300
Fax: 01257 268063
Email: mailbox@taccl.co.uk**