




ENVIRONMENTAL RISK ASSESSMENT

Graphite Resources (DEP) Ltd
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Prepared by:
Sol Environment Ltd

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1. INTRODUCTION

As part of an application for an Environmental Permit Operators must assess the risk to the environment and human health from the activities they seek to permit. This Environmental Risk Assessment has been undertaken in accordance with the online Environment Agency Guidance for undertaking environmental risk assessments. Environmental risks relevant to the existing combustion activity and proposed clinical waste treatment at the Derwenthaugh Ecoparc are:

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

For each of the above environmental criteria the approach to the assessment has followed the following four stage process:

- Identify the risks;
- Assess the risks (assuming those control measures proposed are in place);
- Choose appropriate further measures to control these (if required); and
- Present the assessment.

In completing the assessment prevention and control measures proposed by Graphite Resources (DEP) Ltd are assumed to be in place. Where relevant details of these measures are identified within the assessment.

Environmental Risk Assessment: Emissions						
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)
Point Source \ Releases to Air	Atmosphere	Airborne	<ul style="list-style-type: none"> The pyrolysis units (A1 and A2) and nine gas engines (A3 – A11) will discharge to atmosphere through a single multiflued 35m high stack. All emission concentrations from the pyrolysis units will be in line with those ELV's specified in Chapter IV of the Industrial Emissions Directive (IED). The syngas utilised by the gas engines is subject to EA End of Waste status and as such IED limits do not apply. Nevertheless the emission concentrations from the gas engines will comply with the MCPD requirements. An air quality assessment of emissions to atmosphere from the development, including the pyrolysis units and gas engines has been carried out and provided within <i>Annex D – Air Quality Assessment and Human Health Risk Assessment</i>. The report concludes that the impact of the facilities emissions on existing pollutant concentrations would be not significant at any identified receptor location. All CEMS equipment and associated platforms and sampling ports installed on site will meet the requirements of the Environment Agency Technical Guidance Note M2. All CEMS equipment shall be MCERTS approved. The plant will be fitted with MCERTS approved CEMS equipment which will be linked into the controls system. In the unlikely event of CEMS failure, a full replacement CEMS will be available on site as soon as 	Low: offsite receptor impacts	Air Pollution	VERY LOW due to the proposed processes on site

			<p>possible and the operation will cease until CEMS can be installed.</p> <ul style="list-style-type: none"> • There will be no point source emissions to air directly from the shredder or autoclaves. All air extracted from these sources will be treated via HEPA filter and the Scrubbing Air Handling System for the removal of pathogens and odour prior to discharge to atmosphere. • Microbial air and surface monitoring will take place onsite in accordance with the Guidance to ensure efficiency of the abatement measures. 			
Emissions to Water	Groundwater / Geology / Surface Water	Waterborne	<ul style="list-style-type: none"> • The clinical waste Reception Hall has been fitted with a separate sealed drainage system for the collection of run-off arising from cleaning / disinfecting activities. All run-off will be collected and treated at the onsite wastewater treatment plant prior to discharge to sewer. • The bin wash enclosure has been designed for the containment off all effluent arising from the bin washing process. Effluent is captured and directed via sealed drain to the onsite wastewater treatment plant prior to discharge to sewer. • All other drainage arrangements onsite remain as currently permitted. • Uncontaminated surface water run-off is discharged via pumped interceptor into an unnamed ditch running along the south eastern site boundary. • There are no external activities on site. All processes are internal. • There will be no direct process emissions to controlled water arising from the site. • The Installation has an existing permitted integrated waste water treatment plant that recycles and recovers a majority of the waste water produced by the existing autoclaves. All waste water discharges 	Low: all runoff is controlled on site and all operational and storage activities are internal, therefore the probability of exposure is low.	Contamination	VERY LOW due to the proposed management techniques and drainage arrangements

Emissions to Land	Groundwater / Geology	Spills / Leaks	<p>are emitted directly to sewer from the site WWTP under the existing consent from Northumbrian Water. This will remain as currently permitted.</p> <ul style="list-style-type: none"> • There will be no emissions to land arising from the installation. • There are no external activities on site. All processes are internal. • The entire site is covered in concrete hardstanding. • Spill kits will be strategically located around site. • Minor spills to be cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed. 	<p>Low: spills / leaks could potentially contaminate the ground / groundwater underneath the site.</p>	Contamination	<p>VERY LOW due to the proposed risk management techniques</p>
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Environmental Risk Assessment: Odour							
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)	
Odour from the acceptance and treatment of clinical wastes and the acceptance and treatment of pre-sterilised non-hazardous waste	Local residents (nearest residential receptors approx. 510 m south at the Copse)	Airborne	<ul style="list-style-type: none"> • Strict pre-acceptance and acceptance procedures are in place which ensure that no malodorous waste is accepted onto site. • Clinical wastes are delivered to site bagged and either in enclosed trailers or enclosed bins. • All operational activities take place within the building. This building is kept under negative pressure through the existing Scrubbing Air Handling System preventing loss of air whilst fast action doors are open during vehicle entrance and egress. • No unloading or processing activities take place with fast action doors open. Additional odouring misting sprays are fitted externally over the doors as an additional measure. • A Corgin probe atomiser is located within the reception hall and utilised for de-odourisation of incoming waste streams where required. • The Scrubbing Air Handling System comprises five separate systems, each with two scrubbing towers. Potentially odorous air from specific areas and key processes is drawn into the scrubbing towers where it is subjected to a chemical and water rich environment destroying odour. • Two of the scrubbing systems have been upgraded to include for ammonia destruction as a result of the new clinical waste streams at site. • Potentially odorous emissions from the onsite drier are directed to the Simdean unit for abatement prior to release to atmosphere. 	Moderate: due to proximity of closest receptors	Nuisance	Low – due to the proposed management techniques	

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| | | <ul style="list-style-type: none">• 'Non-condensable' gases arising from the autoclave process are directed through the pyrolysis plant where any odorous compounds are thermally destroyed. In the unlikely event that both pyrolysis units are in shutdown or under maintenance, gases will be diverted to the emergency flare system for thermal oxidation.• The pyrolysis plant has no significant potential for odours as the combustion effectively destroys any odorous compounds within the fuel.• In the unlikely event of any complaints, these will be dealt with in accordance with the sites complaints procedures.• The site operates in accordance with a strict Odour Management Plan. | | |
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Environmental Risk Assessment: Noise							
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)	
Noise emanating from plant	Local Residents	Airborne	<ul style="list-style-type: none"> All potentially noisy plant will be acoustically enclosed and / or fitted with attenuation. Appropriate preventative maintenance will be provided for the various elements of the installation. This will ensure no deterioration of plant or equipment that would give rise to increases in noise and limit the potential for alarm sounding. All equipment has been designed in accordance with best practice and to ensure that any internal noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations, and also to ensure that noise breakout does not lead to noise nuisance at the identified sensitive receptors. A detailed noise assessment has been carried out and concludes no significant impact on the existing noise climate and residential amenity as a result of the operation of the facility if operated in accordance with the recommended mitigation measures. The facility will not give rise to reasonable cause for annoyance. In the unlikely event of any complaints, these will be dealt with in accordance with the sites complaints procedures. 	Moderate: due to proximity of closest receptors	Nuisance	Low – due to the proposed noise mitigation techniques	

Environmental Risk Assessment: Fugitive Emissions							
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)	
Leaks / spillages from tanks / IBC's / drums	Land, Groundwater & Surface Water	Waterborne	<ul style="list-style-type: none"> The site is surfaced in impermeable concrete hardstanding and has a sealed drainage system. All IBC's / drums are stored internally and contained within bunds which will contain spillages. All tanks on site are designed with secondary containment and in accordance with the relevant guidance. All processing activities are enclosed within buildings, where any leaks / spills would be contained. Spill kits are strategically located around site. Minor spills to be cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed. 	Low	Contamination	Very Low: – due to the proposed management techniques	
Dust	Local residents	Airborne	<ul style="list-style-type: none"> The proposed facility will not result in any fugitive emissions of dust. All storage, processing and treatment activities will take place internally within the main building rendering fugitive emissions negligible. There will be no external storage of waste onsite. The drier is enclosed and incorporates particulate filters to prevent any emission of dust during the drying of materials. Dried RDF material awaiting utilisation as pyrolysis feedstock is stored within fully enclosed walking floor bunkers. 	Moderate: due to proximity of closest receptors	Nuisance	Low – due to the proposed management techniques	

			<ul style="list-style-type: none"> • All char generated by the combustion activities onsite will be appropriately stored within a sealed silo prior to export offsite. All collections will be supervised. • Site surfaces and roadways are all concrete hardstanding thereby reducing potential for dusty surfaces. • Vehicle speeds are reduced to 5mph on site which is a recognised method of controlling dust. • All plant will be regularly maintained, inspected and kept clean to avoid a build-up of material, which may lead to dust emissions. • Site drainage and containment systems and associated infrastructure will also be regularly cleared and maintained as required to ensure they are working correctly. 			
Litter	Local residents	Windblown to air	<ul style="list-style-type: none"> • The site access and concrete hardstanding shall be swept as necessary. • All processing and storage of wastes is internal. • All waste is delivered to the site in covered vehicles and unloaded within the building only with the fast action doors closed. • Any waste generated by the facility will be disposed of at the appropriate onsite location and subject to the general site waste management plan. • The site shall be inspected daily by the site manager and any litter or accumulated debris shall be dealt with immediately. 	Low: Little potential for waste to escape	Nuisance	Very Low: – due to the proposed management techniques
Pests	Local Residents	Airborne & via land migration	<ul style="list-style-type: none"> • As the clinical waste will arrive onsite double bagged and any storage will be for short duration and within lockable lidded bins, it is considered that the sites existing pest control measures are sufficient. • However, if a problem does develop, reasonable measures will be taken to use commercially available products and services to control pests. 	Low: the occurrence of pests on site is highly unlikely.	Nuisance	VERY LOW due to the proposed risk management techniques

Environmental Risk Assessment: Accidents						
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)
Fire	Emissions to atmosphere	Airborne	<ul style="list-style-type: none"> Arson by intruders is controlled via security. The site is secured by a perimeter fence with a singular access point via a secure gate. CCTV monitoring of the key areas of site is installed. All plant has appropriate fire detection and suppression systems. Any fire would be immediately identified by sites fire detection and suppression equipment. The sites inspection and maintenance programme will identify any electrical or mechanical machinery faults which could result in a machinery fire. Machinery is regularly cleaned to remove any dust, etc to ensure that this does not accumulate on moving parts. All equipment on site is equipped with dedicated fire suppression. A number of fire extinguishers are placed at strategic locations around the plant. A sprinkler system is fitted above waste storage bays The potential for sparks is regularly monitored by site staff. The risk of damaged or exposed electrical cables is controlled via the regular inspection and maintenance programme. Staff and visitors are only permitted to smoke within the designated area, which is located outside the operational area. 	Low	Nuisance, damage	VERY LOW due to the proposed risk management techniques

			<ul style="list-style-type: none"> • There is no smoking permitted within the operational or storage areas. • All of the storage arrangements in line with Fire Prevention Plan Guidance maximum pile sizes and storage times. • The site has a detailed Fire Prevention Plan. 			
Operator Error	Air / land / water	Various dependant on the nature of the error	<ul style="list-style-type: none"> • The pyrolysis plant will be automatically controlled under normal operation, thereby minimising the potential for operator error. • The automatic control system will include alarms to alert the operator of potential operational problems and where relevant will be triggered with sufficient safety margin to permit operator intervention to prevent an actual problem occurring. • Appropriately qualified and competent staff for clinical waste and incineration activities will be employed in management roles by the facility prior to operations. • All operational staff will be fully trained against the site operating procedures. • Training will include awareness raising of key plant parameters and the potential implications of failure to control operations as designed and the associated potential impact on the environment. • All incidents will be recorded and investigated appropriately according to the site incident procedure. 	Low	Various dependant on the nature of the error	VERY LOW due to proposed management techniques
Vandalism	Operator	The site could be subject to intentional vandalism and damage by intruders /	<ul style="list-style-type: none"> • The site has a CCTV system. • Site is securely fenced and gated. • Unauthorised access is prohibited onsite. • Fencing is inspected daily by operations staff to identify deterioration and damage and the need for repair. • Fencing is maintained and repaired to ensure its continued integrity. If damage is sustained, repair 	Low: the occurrence of vandalism taking place on site is highly unlikely.	Nuisance, Damage or Fire	VERY LOW due to the proposed risk management techniques

		trespassers who could cause damage or harm to the site or cause fires.	will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable.			
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