



## Non Technical Summary

### Graphite Resources

Bespoke Mobile Plant Permit

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**ROOTS**

RECYCLING OF ORGANICS - TECHNICAL SUPPORT

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ROOTS - Recycling of Organics Technical Support

On behalf of Graphite Resources (DEP) Ltd

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# 1.Introduction

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This non-technical summary is submitted in support of the bespoke mobile plant permit application for the Graphite Resources (DEP) Ltd.

Environment Agency application forms require a non-technical summary to be submitted with each application which includes the following:

- A summary of the regulated facilities; and
- A summary of the key technical standards and control measures arising from the risk assessments.

In addition to this document the following supporting information have been submitted:

- Application forms (Parts A, B2, B4, and F1)
- OPRA Spreadsheet
- Technical Competence Certificates;
- Environmental Risk Assessment;
- Environmental Management System Summary
  
- List of proposed waste streams

## 2. Background to Application

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Graphite operate a waste facility at Derwenthaugh Ecoparc, Derwenthaugh Road, Swalwell, under an installation permit (EPRRB3939RR).

The site processes municipal solid waste (MSW) through an autoclave system that sanitises and separates the material into separate fractions for disposal or recycling.

This application is for a bespoke mobile plant permit to allow the spreading of the final organic fraction from the Graphite autoclave process. The Graphite facility processes non-source segregated municipal wastes by an autoclaving operation and waste sorting and separation process. The quality and specification of the Graphite autoclave and subsequent separation processes, results in a high quality organic fibre that is a suitable material to use as an organic soil improver / substitute for restoration applications.

Due to the lack of similar autoclave systems processing municipal solid waste, the outlet options for the output materials are less established than other recycling processes. A trial has been carried out at the site in agreement with the Environment agency to collect data to demonstrate the most suitable outlet for the material.

Although the material is not suitable for agricultural applications, as it is derived from non-source segregated wastes, it is a valuable source of nutrients and organic matter that can be safely

applied to non-agricultural land application to achieve ecological benefit. Data shows that the organic fines material from the Graphite process meets the specification for a soil conditioner, typically applied under a SR2010 No5 mobile plant permit. Due to the lack of other similar systems there is no specific EWC for the organic fraction of autoclaved waste and it is therefore not included on the list of accepted waste acceptable under the Standard Rules (SR2010 No5) permit for restoration land application. It is therefore necessary to apply for a bespoke mobile plant permit to spread this waste.

### 3. Summary of Autoclave Process Producing Organic Fines

The site operates an autoclave and transfer facility under an installation permit (EPR/KB3939RR).

#### 3.1 Waste Acceptance

All wastes undergo a strict waste acceptance protocol and all wastes are inspected on arrival to ensure they meet the waste acceptance criteria agreed with the supplier.

Although the current installation permit has an extensive list of permitted wastes, the site will restrict the input materials that will produce the organic fibre to go to land to household mixed solid waste and the following EWC codes listed in Table 1 below.

**Table 1 Waste types acceptable for autoclave process where subsequent organic fibre is applied to land.**

Waste Code	Description
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION/INDUSTRIAL USE
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 03	Other municipal wastes
20 03 01	mixed municipal waste

#### 3.2 Waste Processing

The waste is shredded before being loaded into the hydraulic hopper. The hopper loads waste into one of the three autoclaves for systems. Once loaded the autoclaves are sealed. The units are rotated and steam is added. The waste is heat treated in batches to ensure all of the waste is sanitised. The process has Animal By-Product (ABP) approval to treat the waste and ensure the fully sanitised and meets Animal By-Products Regulations (ABPR).

The autoclave process takes approximately 45 minutes during which the material is heated to 165°C and is constantly turned to ensure consistent treatment and to reduce the particle size.

Once the autoclaving is complete the units are depressurised. The exhaust steam is condensed as waste heat following recovery within a heat exchanger. The condensate is treated through the water treatment plant and discharged to sewer. Once the steam is exhausted the autoclave doors are opened and the waste removed. Hoods above the autoclaves vent to a scrubbing system to control odour.

The breakdown of biodegradable materials; including food, paper and card into a pulp like fibre during the autoclave process is key to separating contamination from the final material as the non-biodegradable material and rejects become clearly separate from the organic pulp. A comprehensive post-process separation system ensures that all possible recyclates and rejects are then removed leaving a clean fibre material.

The comprehensive post-process separation system separates recyclates, rejects and organic fibre into separate streams. The material goes through a 100mm starscreen, screened fines go through another 20mm screen with magnets and wind-sifters. The final sub 20mm is then trommeled through a 10mm screen to produce the final organic fibre.

The process produces approximately 70% organic fines, 8-13% metals; 1-2% plastics, 11% oversize material for disposal, the remaining ~10% is moisture loss through the process.

After the separation process the final organic material is a sanitised / stabilised clean material. The waste is moved to the recovery area where it is stored in separate areas awaiting dispatch.

### **3.3 Traceability**

Each batch is given a unique number/code when it is loaded into the bay (batch formation). Details of the autoclave process dates and load dates will be recorded with the batch to ensure full traceability of each batch from waste input until dispatch.

### **3.4 ABPR**

The site is approved through APHA to process ABP wastes at the site. The ABPR sanitisation is carried out within the autoclave system.

### **3.5 Sampling**

All samples will be sent to a MCERTS approved lab for testing.

Each sample shall be representative of the batch from which it is obtained and sampling will be carried out in line with BS EN 12579.

Although no specific standards exist for this material, the PAS100 test suite and testing methodology is typically used as the most suitable guideline when proposing to apply organic material to land.

Table 2 Sample Testing Requirement

Analysis of Organic fines	
Pathogens	Salmonella spp (ISO method) E. coli method BS ISO 16649-2
Potentially toxic elements	Cd, Cu, Cr, Ni, Pb, Hg, Zn
Physical contaminants (incl 'sharps')	Glass, metal, plastic and 'other' (not stones)
Stability / maturity	Evolved carbon dioxide
Physico-chemical	pH, Bulk density, C:N, Organic Matter (LOI), Moisture Content
Plant Nutrient Tests	Total N,P,K, Mg, S

Sampling frequency will be every 5000m<sup>3</sup> of material produced.

## 4. Proposed Activities

All activities carried out under the proposed mobile plant permit will be as per the Standard rules SR2010No5 - Mobile plant for the reclamation, restoration or improvement of land permit. The only variation will be the addition of 19 12 12 Graphite Autoclave Organic Fibre Material to the accepted list of wastes in table 4.

All proposed activities have been summarised below:

### 4.1 Summary of Activities

The proposed bespoke mobile plant permit will allow the operator to operate mobile plant. The mobile plant shall be for land treatment activities on notified land that has been subject to industrial or other man-made development for restoration, reclamation or improvement in England and Wales resulting ecological improvement.

To facilitate the application of the wastes the following technology and associated plant necessary for treatment and associated storage:

- plant for the storage and mixing (not for treatment) of permitted wastes listed in table 4
- plant for the spreading of wastes in order to carry out treatment of land to create or improve a soil profile.

The activities shall not be carried out within:

- 10 metres of any watercourse;
- 50 metres of any spring or well, or any borehole used to supply water for domestic or food production purposes. This must include private water supplies.
- Groundwater Source Protection Zone 1.

The operator will submit a deployment form to the Environment Agency, prior to the activity commencing

#### **4.2 General Management**

The operator will manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; see Appendix 2 – Environmental Management system (EMS)

(b) using sufficient competent persons and resources (See Appendix 5)

#### **4.3 Record Keeping**

Records demonstrating compliance with the permit and EMS shall be maintained.

Any person having duties that are or may be affected by the matters set out in the permit shall have convenient access to a copy of them kept at or near the place where those duties are carried out.

The operator shall comply with the requirements of an approved competence scheme.

#### **4.4 Avoidance, recovery and disposal of wastes produced by the activities**

The operator will take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

The operator will review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

#### **4.5 Permitted Activities**

At least 25 working days in advance of starting each land treatment activity the Environment Agency will be notified using the deployment form LPD1. For each deployment:

- no more than 10 waste streams, and
- no more than 50 hectares shall be notified.

Each notification will contain an assessment that shows that benefit will be conferred by spreading of the waste. The assessment shall be made by a person with appropriate technical

expertise and contain evidence demonstrating the reasons for their opinion.

The activities will not begin at any site until the Environment Agency has agreed a deployment form in writing for that particular site.

The activities will only be carried out in accordance with the requirements of the agreed deployment form unless otherwise agreed in writing by the Environment Agency.

Records demonstrating compliance with permit shall be maintained.

**Table 3 List of the proposed permitted activities to be carried out under the permit.**

<b>Table 3 Activities</b>	
<b>Description of activities</b>	<b>Limits of activities</b>
<p><b>R13:</b> Storage of wastes pending the operation numbered R10.</p> <p><b>R10:</b> Land treatment resulting in benefit to agriculture or ecological improvement</p>	<p>Secure storage of waste listed in table.4, at the place where it is to be used for land treatment.</p> <p>No more than 3000 tonnes of waste shall be stored at any one time.</p> <p>Waste shall be stored for no longer than 12 months.</p> <p>The use of mobile plant to treat land that has been subject to industrial or other man-made development where such treatment results in benefit to agriculture or ecological improvement.</p> <p>The use of wastes listed in tables 4 for the treatment of land that results in ecological improvement.</p> <p>The quantity of waste applied per hectare shall not exceed that in the agreed deployment form and in any case no more than 5000 tonnes of waste shall be spread per hectare.</p>



## 4.6 Waste Acceptance

Waste will only be accepted if:

- it is of a type listed in the waste table below
- it conforms to the description in the documentation supplied by the producer and holder; and
- it conforms to the agreed deployment form.

Records demonstrating compliance with the above be maintained.

**Table 4 – List of proposed permitted wastes**

<b>Table 3 Waste types</b>	
<b>Waste Code</b>	<b>Description</b>
<b>03</b>	<b>WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD</b>
<b>03 03</b>	<b>wastes from pulp, paper and cardboard production and processing</b>
03 03 05	de-inked paper sludge and de-inked paper pulp from paper recycling only
03 03 09	lime mud waste
03 03 10	fibre rejects and sludges including mineral based fillers and coatings only
03 03 11	sludges from on-site effluent treatment other than those mentioned in 03 03 10
<b>10</b>	<b>WASTE FROM THERMAL PROCESSES</b>
<b>10 01</b>	<b>wastes from power stations and other combustion plants</b>
10 01 05	gypsum (solid) only
10 01 07	gypsum (sludge) only
<b>10 13</b>	<b>wastes from manufacture of cement, lime and plaster and articles and products made from them</b>
10 13 04	wastes from calcinations and hydration of lime
10 13 12*	cement kiln dusts and by-pass dust only
10 13 13	cement kiln dusts and by-pass dust other than those mentioned in 10 13 12 only
10 13 99	gypsum only
<b>17</b>	<b>CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)</b>
<b>17 05</b>	<b>soils (excluding excavated soils from contaminated sites), stones and dredgings</b>
17 05 04	soil and stones including chalk other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
<b>17 08</b>	<b>gypsum-based construction material</b>
17 08 02	gypsum only
<b>19</b>	<b>WASTE FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE</b>
<b>19 02</b>	<b>wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)</b>
19 02 03	cement kiln dust and by-pass dust from cement kilns conditioned with water only
19 02 04*	cement kiln dust and by-pass dust from cement kilns conditioned with water only
<b>19 05</b>	<b>wastes from aerobic treatment of waste</b>
19 05 03	compost from source segregated biodegradable waste only
19 05 99	compost derived from non-source segregated biodegradable waste

<b>19 06</b>	<b>waste from anaerobic treatment of waste</b>
19 06 03	liquor from anaerobic treatment of non-source segregated biodegradable waste
19 06 04	whole digestate and fibre digestate from anaerobic treatment of non-source segregated biodegradable waste
19 06 05	liquor from anaerobic treatment of source segregated biodegradable waste only
19 06 06	whole digestate and fibre digestate from anaerobic treatment of source segregated biodegradable waste only
<b>19 08</b>	<b>waste from waste water treatment plants</b>
19 08 02	washed sewage grit (waste from desanding) only
19 08 05	sludges from treatment of urban waste water
<b>19 09</b>	<b>wastes from the preparation of water intended for human consumption or water for industrial use</b>
19 09 02	sludges from water clarification
<b>19 12</b>	<b>Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified</b>
19 12 12	soil substitutes other than that containing dangerous substances only
19 12 12	Graphite Organic Fibre
<b>19 13</b>	<b>wastes from soil and groundwater remediation</b>
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03

## 5. Environmental Management

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### 5.1 Point Source Emissions

There shall be no point source emissions to land, except from the sources listed in the agreed deployment form.

The limits given in the agreed deployment form shall not be exceeded.

### 5.2 Odour

All spreading / storage activities will be carried out in line with the operators Odour Management Plan.

### 5.3 Noise

Spreading operations have been assessed and identified to create minimal noise however each individual deployment application will be assessed any a noise and vibration management plan will be implemented if this is required to prevent or minimise any noise and vibration carried out by any activities associated with the operation.

## 6. Technical Competence

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The nominated technical competent person responsible for the mobile plant operations will hold the relevant WAMITAB qualification. A copy of the certificate is included in the application. See Appendix 5.

## 7. Technical Assessments

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### 7.1 Environmental Risk Assessments for proposed waste type

#### 19 12 12 (Graphite Organic Fibre)

As part of the mobile plant permit application a risk assessment has been carried out on the proposed waste type 19 12 12 (Graphite Organic Fibre) in accordance with the Environment Agency's Guidance on Risk Assessments – 1st February 2016.

The risk assessments must identify whether any of the following risks could occur and what the environmental impact could be, the following were carried out:

- surface or groundwater emissions
- accidents
- odour
- noise and vibration
- fugitive emissions

All of the above risks considered in the assessments. Each risk assessment identifies the potential receptors and the pathway from the hazard to those receptors. In addition, the risk assessments include a summary of the preventative management techniques, detailed in the site management plans along with an assessment of the mitigated risk.

Results of the assessments show that the addition of the new waste type to the mobile plant permit does not impact on any of the above.

### 7.2 Site Specific Risk Assessment

As part of the deployment application process a site specific risk assessment will be carried out for each proposed land application.

## 8. Management Systems

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The operators Environmental Management System provides a written procedure for all mobile plant operations. The EMS details all of the techniques for pollution control and are written following Environment Agency Guidance - Develop a management system: environmental permits The EMS includes mitigation measures identified from environmental risk assessments, health and safety requirements.