

DC/06/45887



creating a better place  
Our ref: EA/WML/50039  
Date: 30<sup>th</sup> August 2006

0161



Environment  
Agency

John Dodd  
Planning Department  
Sandwell Local Borough Council  
Development House  
Lombard Street  
West Bromwich  
West Midlands  
B70 8RU

SANDWELL METROPOLITAN BOROUGH COUNCIL			
DEVELOPMENT HOUSE			
WEST BROMWICH			
04 SEP 2006			
EX DIR UR	PLAN	FILE NO	
	de		
FILE NO			

Dear Mr Dodd,

**THE WASTE MANAGEMENT LICENCING REGULATIONS 1994 (SI 1994/1056)  
THE ENVIRONMENTAL PROTECTION ACT 1990**

Application reference: EA/WML/50039  
Applicant: Deep Green UK Ltd  
Deployment Address: The former W H Keys Site, Church Lane, West Bromwich

**NOTIFICATION OF DEPLOYMENT FORM**

The above applicant has recently submitted a deployment form to commence remediation work in your area.

The application will be determined over the next few weeks.

Please find enclosed a copy of the deployment form. If you would like to make comments regarding any issue of the proposed remediation work to be carried out please contact me on the details below.

Yours faithfully

  
**CLAUDINE RUSSELL**  
Permitting Officer

Direct dial: 01732 223263  
Direct E-mail: [claudine.russell@environment-agency.gov.uk](mailto:claudine.russell@environment-agency.gov.uk)



**SCANNED**

Date 21/8/06  
50039

Claudine Russell  
Strategic Permitting Officer  
Kent Area Office,  
Orchard House,  
Endeavour Park,  
London Road,  
Addington,  
West Malling  
KENT  
ME19 5SH

21 AUG 2006

RECEIVED NO  
QUICKER

16<sup>th</sup> August 2006

Your ref: EAWML50039/CR

Dear Ms Russell,

**ENVIRONMENTAL PROTECTION ACT 1990  
WASTE MANAGEMENT LICENSING REGULATIONS 1994  
DEPLOYMENT FORM – WEST BROMWICH**

Please find below our response to the issues you have raised in relation to this deployment.

**Section 4**

**What is the height of the fencing that will be erected around the perimeter of the site?  
Deviation from the mobile treatment licence standard condition of 1.8 metres will need  
to be agreed in writing.**

The fencing around the perimeter of the whole site is previously existing, and deemed suitable by the EA during previous activities licensed at the site. It is a substantial permanent anti-trespass fence of 1.8m or more. The operational area for the thermal desorption plant will be fenced using temporary security fencing anti-climb panels, footings, and clips of the design extensively used on construction sites. This is in compliance with the mobile treatment licence.

### **Site Plan**

**Your site plan needs to contain the following information:**

- **Security and access arrangements**
- **Process treatment and storage areas, including any buildings, bays and fixed tanks, areas of hardstanding, areas of impermeable pavement and sealed drainage systems**
- **Drainage systems for the operating site, including all interceptors, sumps and discharge points**
- **Proposed location of pollution control measures**

**Please amend the current site plan, or provide further site plans to indicate all of the above information.**

### **Security and access arrangements**

The site plan indicates the site is fully fenced and has a security fence of at least 1.8m in height. Any breaks in the fence will be repaired the day they are discovered. There is only one means of access to the site and this has a guard present during normal working hours and is secured outside of normal working hours. In addition, outside of normal hours a 24-hour security patrol will be operating.

### **Process treatment and storage areas, including any buildings, bays and fixed tanks, areas of hardstanding, areas of impermeable pavement and sealed drainage systems**

Where they exist, these are shown on the attached drawing.

### **Drainage systems for the operating site, including all interceptors, sumps and discharge points**

The existing site has had the former buildings removed and the ground levelled. It is understood there are no interceptors, sumps and discharge points at the site and certainly DGUK will not require the use of any of these if they existed.

### **Section 7**

**You have indicated that planning permission is not required for the project. Is this because you are not responsible for the overall remediation contract? If so, please could you provide contact details of the contractor responsible for the overall remediation contract who oversees that the land is remediated to the specified site remedial targets. If possible could you provide the planning permission reference number.**

**Where is the water used for cooling going to? Please provide a diagram indicating the pipework to the collection area for water that you mention. Please confirm that the water used or collected does not discharge off site.**

Deep Green (UK) Limited has been contracted as a specialist supplier of thermal desorption services and in this sense DGUK has not been required to obtain planning permission directly. Our task is to receive screened material from the Client and treat the material in our plant. Treated material is stockpiled until laboratory analysis is obtained that shows the material has been suitably treated.

**The party in overall management of the project is:**

Mar City Developments  
Mar House  
1036 Stratford Road  
Shirley  
Solihull  
West Midlands  
B90 4EE

The planning application to Sandwell Metropolitan Borough Council has the reference DC/06/45887 (Former W H keys Ltd, Church Lane, West Bromwich). Planning Permission has been granted.

**Where is the water used for cooling going to?**

The water used to cool the soil also rehydrates the soil and so it is retained within the treated soil and there are no water discharges from the process.

**Please provide a diagram indicating the pipework to the collection area for water that you mention.**

The water used is mains water.

**Please confirm that the water used or collected does not discharge off site.**

Confirmed.

**Section 9**

In your supporting information you mention that the surface will be impermeable hardstanding, this is a contradiction in terms. Hardstanding is a surface such as type one that permits rainwater etc to pass through it and into the underlying ground. An impermeable surface is a surface such as concrete that does not permit any liquid to pass through. Please confirm which type of surface you are referring to.

My understanding of a 'hardstanding' is different to the one you hold. The Compact Oxford English Dictionary defines it thus:

**hardstanding**

noun Brit. ground surfaced with a hard material for parking vehicles on.

The EA 'Guidance on the Standards for Storage and Treatment of End-of-life Vehicles' provides a good summary of the issue:

'Impermeable surfaces normally provide the primary control mechanism against the risk of pollution of soils, groundwaters and surface waters. If vehicles are stored or dismantled on a hardstanding that is not impermeable then, notwithstanding that the risks posed by them are significantly reduced through the depollution exercise, the primary control mechanism is absent.'

And :

'A surface will not be impermeable and therefore will be unacceptable if, for example, - it is composed solely of hardstanding made up of crushed or broken bricks or other types of aggregate'

And:

**Template for an Application Site Report in PPC Applications**  
**4.3 Hardstanding and Bunds**

'Detail the integrity of areas of hardstanding and bunds (not covered in Section 4.2 above) that provide a barrier to the downward percolation of substances. This should include process areas, transfer areas, drum or waste storage areas etc.'

Elsewhere, the EA refer to 'concrete hardstandings'. These references suggest therefore that there is a wider meaning to hardstanding than maybe you suggest.

On this project an area has been prepared for the location of the main components of the plant. This area has a sub-base of crushed brick and concrete of at least 500mm depth. Atop this, is a layer of

1000 grade membrane with 1m overlaps has been placed. Protecting this membrane is an additional layer of sacrificial crushed concrete and brick of at least 300mm the top surface of which will be vibrated in situ. On completion of the project this sacrificial layer will be removed, tested and if necessary, disposed. The underlying material will then be tested to ensure it is safe to be retained.

The membrane from the platform area is integral with the drainage channels that surround the area such that any run-off from the area will be directed into the channels and then into a collection sump. The sump will be inspected regularly and sampled to help determine the appropriate fate of any waters collected.

The drainage ditches surrounding the platform have been culverted in places to allow vehicular access.

The feed hopper for the plant will be located outside of this prepared area and placed on a concrete hardstanding from a previously existing building. A conveyor from the feed hopper will transport the soil to the main plant. The soils surrounding the hardstanding on which the feed hopper is located are contaminated and will require treatment in the plant. Consequently, any spillage that may occur during loading operations will not significantly change the contaminant loading of the soil in the immediate area. The area around the feed hopper area is planned to be that last portion of the site to be remediated.

Treated material awaiting analytical approval will be stored on a concrete hardstanding, and treated material which has analytical approval will be expeditiously placed into areas as a restoration material.

### **Section 13**

**Condition 36.1** of your mobile treatment licence required monitoring of aerial emissions to be carried out twice daily, this can be altered within the agreed deployment form, if you do not intend to keep to this frequency you will need to alter your submitted information to list the new frequency and justify why, on this site, the aerial emissions monitoring can be carried out at a different frequency.

The monitoring plan for the site also needs to include the following information;

- **Baseline monitoring programme**
- **Trigger levels for all of your indicator parameters**
- **The construction of the monitoring point**
- **The location of the monitoring point**
- **Monitoring protocol**
- **Frequency of monitoring.**

**Please amend the deployment form submitted, to include all of the above information.**

There are two facets to aerial emissions with thermal desorption plant. The first are those emissions common to all forms of mobile treatment processes: noise, dust, odour etc. Secondly, there are the emissions from the exhaust stack.

### **Common Emissions**

#### **Baseline Monitoring Programme**

Preparation work has been underway at the site for some months now. This has involved clearing the site of waste, demolition of buildings, and general site preparation prior to remediation operations commencing. This work has been undertaken by the site owner. The value of any baseline data collected by DGUK during this period, and whilst work is underway, would produce a skewed and unrepresentative baseline upon which to base the impact of our plant and would have been of no worthwhile value. The project will be assessed against to combined impact of our plant and other works underway as a combined operation.

The local EA and Borough Council are closely involved in the work presently underway at the

site (that is the site clearance and preparation) and are in close contact with Mar City Developments on these issues.

A 24-hour noise baseline has been obtained.

**Trigger levels for all of your indicator parameters**

The trigger level established in our submission is that if, in the opinion of the Project Manager or qualified technician, the emission (noise, dust, smell etc.) was 'excessively high or likely to cause a nuisance'. Clearly, the measure here is whether it was reasonably believed the emission would have, or could be expected to have, an adverse impact on others (i.e. neighbours, co-workers, or the environment).

If a complaint is received, this will automatically trigger a response and investigation of the complaint.

The submission sets out a series of possible actions to be undertaken in such circumstances.

**The construction of the monitoring point**

The monitoring points are locations, and some are located on public land. There is no construction involved for routine observations. We are not intending to take water samples from discharges, there being no planned discharges. Should action be required to undertake specialist monitoring (e.g. specialist dust monitoring) then discussions would take place with the EA and Borough Council EHO at that time.

**The location of the monitoring point**

A plan showing the location of the monitoring points has been supplied.

**Monitoring Protocol**

The monitoring protocol is essentially as set out in our submission. The site will be inspected (now twice daily) for all potential nuisances with the trigger for further action as set out above. These inspections will be logged.

A copy of our Standard Operating Procedure for Environmental Aspects is attached for your information. This will be adapted to reflect site specific circumstances (such as frequency and sampling locations) once all aspects have been determined.

**Frequency of monitoring.**

With regard to frequency, we are happy to undertake the monitoring for aerial emissions twice daily.

**Exhaust Stack Emissions**

It is not possible, save visual inspection of any exhaust plume which is itself meaningless from an emissions standpoint, for an individual to 'monitor' emissions from the exhaust stack - which is why the plant is fitted with in-line continuous monitoring and recording of key indicator parameters. This is dealt with further in our response to section 14.

**Section 14**

**You have given indicator parameters, please justify why these are the most important parameters for detecting pollution, harm to human health or detriment to the locality.**

Our initial submission stated:

'Continuous monitoring will be undertaken for the following parameters:

- SO<sub>x</sub> – to ensure sufficient lime is being used
- NO<sub>x</sub> – ensure adequate combustion of the fuel being used
- CO – to ensure that complete combustion is being achieved
- CO<sub>2</sub>/Oxygen – to ensure there is sufficient oxygen for combustion

The sensors used are attached to the oxidising unit. A fully automated system including data logging is used.

Gas samples are taken during the commissioning phase and at approximately every 10,000 tonnes of material treated. These are sent to an independent laboratory for chromatograph analysis. These gas samples are used to determine the levels of marker emissions (as listed above) that signify complete treatment is being achieved and emissions are acceptable.'

The standard methodology for thermal desorption plant is that once the plant is constructed, test treatments are undertaken on a representative sample of material under different operating conditions either side of the anticipated operating temperature for the desorption process. Steps of 25°C are chosen. Stack emission samples at the design temperature and other temperatures are then taken and sent for analysis as is the quality of the treated soil.

Once the data is returned the optimum temperatures for operating the plant can be determined. This will be the temperature that ensures the contaminants are suitably desorbed from the soil, and the operating temperature of the gas abatement process to ensure contaminants are suitably destroyed and that other contaminants are not able to form in the chamber. Too low a temperature will lead to incomplete soil treatment or excessive gaseous emissions, too high a temperature will lead to excessive fuel use and consequently elevated CO<sub>2</sub> production. Once the optimum temperatures are determined, a factor of safety to allow for expected variation in feed stock quality, the levels of SO<sub>x</sub>, NO<sub>x</sub>, CO and CO<sub>2</sub>/Oxygen that existed at this temperature can be determined i.e. when the plant was operating optimally what the emission levels of these parameters actually were.

Essentially, if these four parameters are then maintained within acceptable limits it indicates that the plant is operating optimally and the full suite of contaminants emitted from the stack will also be within limits. This is standard practice

The indicator parameters which are monitored continuously are those in common usage on thermal desorption plant around the world. They are chosen as it is not practical to monitor in line other contaminants that may be potentially of more concern, but they have the property of being related in some way to contaminants of greater concern. I will seek to expand on the information provided above:

- SO<sub>x</sub> – to ensure sufficient lime is being used.

Sulphur dioxide is a noxious and odorous gas. In line monitoring ensures emission levels are maintained below WID limits. To reduce emission levels of sulphur dioxide, small quantities of lime can be to the process.

- NO<sub>x</sub> – ensure adequate combustion of the fuel being used

The level of nitrogen dioxide is an indication of whether complete fuel combustion is taking place. This could be affected by the volume of fuel entering the desorption or oxidation chamber is too high, oxygen levels are too low, or the operating temperatures have fallen too low.

- CO – to ensure that complete combustion is being achieved

This parameter, coupled with the CO<sub>2</sub>/Oxygen parameter below are measured to ensure complete combustion takes place in the oxidising chamber. If insufficient oxygen is present a greater proportion of CO to CO<sub>2</sub> will be produced and this is an indication that incomplete combustion of the contaminants may be taking place. Ensuring the ratio between these two parameters is maintained ensure that sufficient oxygen and residence time exists to ensure complete destruction of the contaminants.

- CO<sub>2</sub>/Oxygen – to ensure there is sufficient oxygen for combustion

See CO above.

### **Section 17**

**How will you ensure a constant feedstock to the plant? Will you be testing the excavated materials? Do you envisage a need for blending the excavated materials, and if so, how will this be achieved without causing dust, noise, air emissions? Can all of the material on site be treated by the thermal desorption plant? Given that the site was previously used to manufacture chemicals etc are there any soils that are high in mercury, sulphur or asbestos for example that the plant cannot treat? If this is the case, please state the maximum thermal desorber contaminant feed concentration (mg/kg) for these materials, and how you intend to ensure that these levels are not exceeded whilst running the operation on site.**

The material will be subject to at least three homogenising processes. Firstly, it will be excavated from selected areas of the site and screened. Then it will be moved from the screening area and stockpiled, and finally it will be moved from the stockpile and loaded into the plant feed hopper. These processes will ensure the feed to the plant will be highly homogeneous. The excavation, screening and stockpiling is undertaken by Mar City Developments.

When operating the plant, immediate feedback is obtained should the quality of feedstock vary. The feedback may be in the form of a reduced temperature in the desorption chamber (due to increased moisture) or fluctuations in the in line monitoring readings. This does not necessarily mean that the emissions will go out of specification but may mean, for example, additional fuel is required for a period to restore optimum conditions and ensure the operating factor of safety is restored.

Sampling of feedstock will be undertaken on an as required basis, with obviously more sampling early on in the project. The thermal desorption process is able to cope with wider fluctuations of input quality than almost all other waste treatment processes and still produce acceptable outputs.

The whole site has been subject to detailed site characterisation and assessment and is amenable to treatment by thermal desorption. I understand your colleagues in the EA office responsible for the area are involved in this matter and I would refer you to them for more details.

In answer to the specific issues you mention: mercury, sulphur and asbestos:

Since mercury volatilizes at low temperature we will need to comply with the WID limit for mercury emissions. Site investigations indicate mercury levels are acceptable and on site stack tests will demonstrate if this is so.

Sulphur – as previously advised we monitor sulphur dioxide continuously and will need to meet WID limits.

Asbestos – the site investigation indicates negligible levels of asbestos.

### **Section 19**

**Please provide details of your plant commissioning, operating and maintenance procedures, including documentation and record keeping, to ensure that emissions from the process do not cause pollution of the environment, harm to human health or serious detriment to the locality. You mention in the supporting information that you have a protocol summarising commissioning – please provide this information ensuring that it covers all of the above points.**



As discussed the plant commissioning documents are extensive and extend across several shelves as do the maintenance and operating procedures. Management and control of emissions from the plant is covered above.

A summary protocol is attached.

### **Section 21**

**Please submit details of your noise monitoring plan for the site, this will need to include the following;**

- **Baseline monitoring programme**
- **Trigger levels for noise**
- **The location of the monitoring points**
- **Monitoring protocol**
- **Frequency of monitoring**
- **Experience and qualifications of the personnel carrying out the monitoring and the personnel responsible for interpreting the results and acting on them**
- **Emissions action plan**

**If this information has already been agreed with the local authority for the site, this is likely to be satisfactory for the deployment, if this is the case please forward the details of the levels set and how you intend to make sure that you will meet these levels on site.**

#### **Baseline Monitoring Programme**

A 24-hour noise baseline has been obtained.

#### **Trigger levels for noise**

The trigger level established in our submission is that if, in the opinion of the Project Manager or qualified technician, the emission was 'excessively high or likely to cause a nuisance'. Clearly, the measure here is whether it was reasonably believed the emission would have, or could be expected to have, an adverse impact on others (i.e. neighbours and co-workers). However, a noise complaint will automatically trigger an investigation by the Project Manager.

The submission then sets out a series of possible actions to be undertaken in such circumstances.

#### **The location of the monitoring points**

A plan showing the location of the monitoring points has been supplied.

#### **Monitoring Protocol**

The monitoring protocol is essentially as set out in our submission. The site will be inspected (now twice daily) for noise with the trigger for action as set out above. These inspections will be logged.

A copy of our Standard Operating Procedure for Environmental Aspects is attached for your information. This will be adapted to reflect site specific circumstances (such as frequency and sampling locations) once all aspects have been determined.

#### **Frequency of monitoring.**

With regard to frequency, noise will be monitored twice daily.

#### **Experience and qualifications of the personnel carrying out the monitoring and the personnel responsible for interpreting the results and acting on them**

The assessments will be undertaken by staff holding a WAMITAB certificate or specially trained operators. The Project Manager will be responsible for interpretation of the data

collected and if in his opinion, additional monitoring is required by a specialist and appropriately authorised noise assessment company that will be undertaken.

**Emissions action plan**

The actions as a consequence of reaching the trigger conditions has been detailed above.

**Section 25**

**You mention that there are not any anticipated periodic breaks, will there be a regular break for preventative maintenance to be carried out on the plant?**

Yes. Planned Preventative Maintenance will be undertaken weekly.

**Ancillary Questions**

- 1. Do you have any information on any ambient air quality standards – please refer to IPPC horizontal guidance note H1 for further guidance on this issue? How will you ensure that these aren't exceeded?**

It is understood that no special air quality standards exist for the area.

- 2. What are your proposed stack emission limits?**

Those that exist in the WID Directive applicable to the use of RFO.

- 3. Please include a process flow diagram of how the plant will be constructed at this site and to aid understanding of the process show where all of the material and water etc goes throughout the process.**

Attached.

- 4. Please provide details of the proposed technically competent management for the site and forward copies of their WAMITAB certificates.**

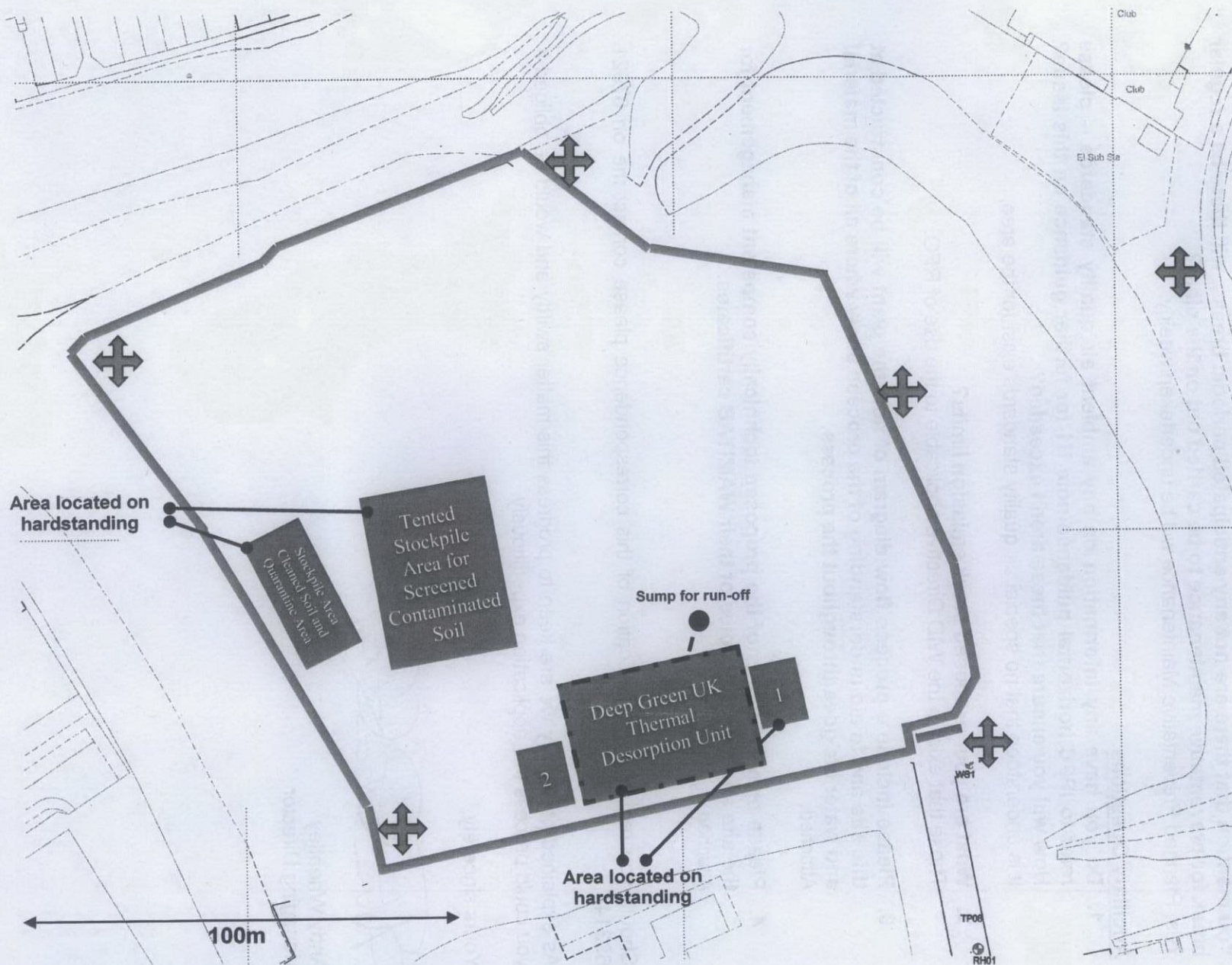
Attached.





Should you require any clarification of this correspondence please contact me on 07921 693144.

As explained previously we are keen to progress this matter swiftly and would be obliged if you could process this application expeditiously.

Yours sincerely,

  
Andy Wheatley  
Managing Director



-  Site Operational Boundary and Security Fence
-  Manned Entrance Security Gate
-  Odour, dust, and noise monitoring location
-  Run-Off Collection System
- 1 Concrete hardstanding for hopper feed unit
- 2 Bunded fuel storage tank

 **Deep Green (UK) Limited**

Mar City Developments Limited

W.H. Keys  
West Bromwich

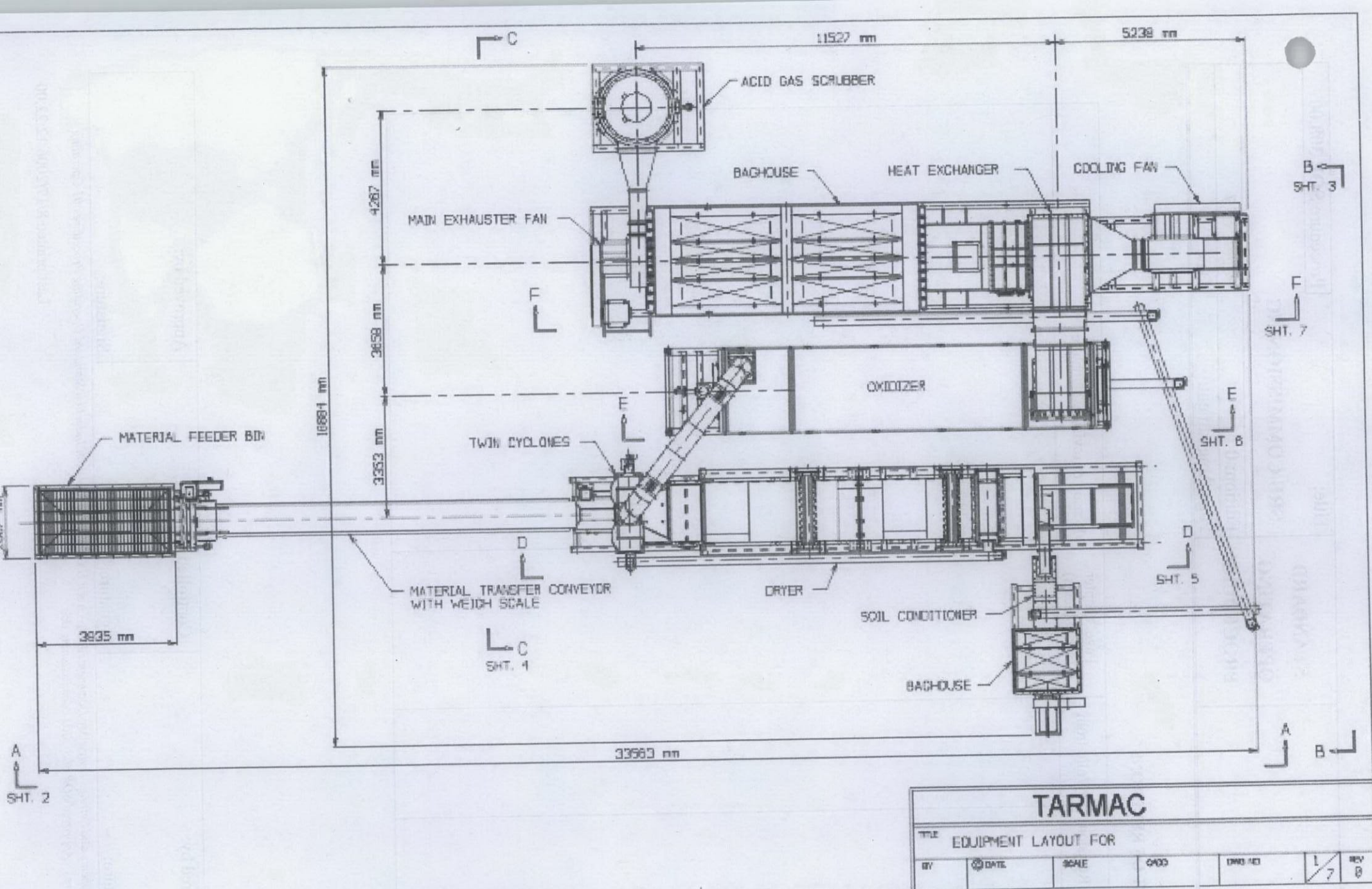
**General Site Layout**

16 Aug 2006

Drg/MarCity/16/08/06

Note: Contamination is widespread throughout the site.





	<b>STANDARD OPERATING PROCEDURE</b>	Title:	Procedure SOP 308.00
		<b>SRU COMMISSIONING</b>	
		Edition: 0	Page 1 of 7
		Page Amendment:	Date:

#### LIST OF REVISIONS

Revision	Valid from	Page, chapter (attachments)	Reason of revision/ signature

Prepared by:	Controlled by:	Approved by:
Signature:	Signature:	Signature:

	<b>STANDARD OPERATING PROCEDURE</b>	Title:	Procedure SOP 308.00
		<b>SRU COMMISSIONING</b>	
		Edition: 0	Page 2 of 7
		Page Amendment:	Date:

### 1. **Purpose and Allocation:**

- This procedure is meant to set up basic responsibility in SRU health and safety aspects.

### 2. **Scope:**

- Health and safety is an important part of every operation. This document shall set up the basic responsibility in the H&S matters.
- This document applies to all SRU operations of DGUK.

### 3. **Responsibility:**

#### • **Project manager**

The Project Manager is responsible for implementation of this procedure among DGUK projects and enforcing the policy

### 4. **Definitions:**

See SOP 301.00 project preparation manual for definitions and abbreviations.

### 5. **Requirement and Responsibility:**

#### **SRU assembly**

- When SRU assembly is completed and ready to be operated, the series of the checks must be completed and the plant must be signed of.
- A series of independent inspections must be carried out on different parts of SRU. The Project Manager is responsible for organising following inspections with the appropriate personnel or authorities:
  - Electrical equipment and Earthing inspection
  - Pressure equipment inspection
  - Gas equipment inspection
  - Lifting equipment inspection
- SRU Assembly Completion Form is to be completed and signed by the Project Manager. Relevant independent inspection reports must be attached to this form.
- Assembly Completion Form must cover the following issues:
  - Project Name
  - Plant – name, type of the plant, reference number details.

	<b>STANDARD OPERATING PROCEDURE</b>	Title:	Procedure SOP 308.00
		<b>SRU COMMISSIONING</b>	
		Edition: 0	Page 4 of 7
		Page Amendment:	Date:

- List of attachments – list of attachments shall be added to this protocol, besides SRU Assembly protocol and its attachments it must contain Operational Journals and SRU data sheets from the mechanical testing and burn test plus any other relevant document.
- On completion the Protocol is to be signed by the Project Manager.

#### 6. **Archiving:**

- The original copy of the complete SRU commissioning protocol with all attachments is to be securely stored in the Project Manager's office.
- Upon project completion, the document is transferred in to the DGUK head office and archived with the appropriate project file.

#### 7. **Attachments:**

Assembly Completion Form  
Commissioning protocol



	<b>STANDARD OPERATING PROCEDURE</b>	Title: Procedure SOP 308.00	
		<b>SRU COMMISSIONING</b>	
		Edition: 0	Page 6 of 7
		Page Amendment:	Date:

SYSTEM	SUBJECT OF CONTROL	COMENT
Feeding system	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Desorber and screw conveyors to cooling system	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Soil cooling system and clean material conveyors	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Oxidising chamber	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Baghouse and heat exchanger(s)	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Main Fan	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Other 1:.....	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Other 2:.....	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Other 3:.....	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	
Other 4:.....	work completed	
	system assembled	
	safety equipment in place	
	Ready for operation	


**Based on my observations, noted in this protocol, this plant assembly is completed and ready to proceed in to the commissioning phase.**

Date and Time:	Name and position:	Signature:

## Attachment 2: Form 308.02



	<b>STANDARD OPERATING PROCEDURE</b>	Title: Procedure SOP 308.00	
		<b>SRU COMMISSIONING</b>	
		Edition: 0	Page 7 of 7
		Page Amendment:	Date:

	<b>MANAGEMENT DOCUMENT SYSTEM</b>	<b>WORK PROCEDURES</b> file name: SRU operation forms	Form 308.02
			Rev:0
			Page: 1
			Total pages: 1

<b>SRU COMMISSIONING PROTOCOL</b>	
Project name:	Plant:
Mechanical test summary:	
Burn test summary:	
List of attachments:	
<b>Based on the facts stated in this protocol and its attachment, I am stating that the plant is now completed and ready for safe operation.</b>	
Date and Time:	Name and position:
	Signature:

	<b>STANDARD OPERATION PROCEDURE</b>	Title:	Procedure SOP XYZ.00
		<b>ENVIRONMENTAL ASPECTS</b>	
		Edition: 0	Page 1 of 3
		Page Amendment: ?	Date: date of validity

## 1. Purpose

To ensure that all Environmental Aspects are recognised and dealt with appropriately. These aspects include, monitoring, complaints and reporting.

## 2. Scope

This document applies to all DGUK staff. It applies to all Thermal Desorption projects undertaken by DGUK

## 3. Responsibility:

### **Project Manager**

The Project Manager is responsible for the implementation of this procedure among DGUK projects

### **All Staff**

All Staff are responsible for adhering to this procedure

## 4. Requirement and Responsibility:

### **Environmental Complaints, Non-Compliances and Near Misses**

All environmental complaints, non-compliances and near misses are to be recorded along with any remedial actions taken.

Details of all environmental complaints are to be logged in the Site Diary and sent to the Project Manager as they arise details are to include:

- Date / Time
- Details of Complainant
- Nature of Complaint
- Initial Response Action
- Response to Complainant
- Outcome / Current Status

### **SEPA, EA Inspections or other regulating authorities Visits**

A representative from DGUK is to accompany SEPA/EA/Other inspectors during site visits and inspections for safety reasons.

The Site Manager is to ensure that a representative from DGUK signs all inspection reports and that the inspector records any comments from DGUK on the inspection report. If DGUK staff are in disagreement with the report findings comments to that effect are to be made on the form if at all possible.

	<b>STANDARD OPERATION PROCEDURE</b>	Title:	Procedure SOP XYZ.00
		<b>ENVIRONMENTAL ASPECTS</b>	
		Edition: 0	Page 2 of 3
		Page Amendment: ?	Date: <b>date of validity</b>

Copies of all inspection reports are to be archived within the site office, along with an explanation and details of corrective action where necessary.

### Noise

It is the intention of DGUK to regularly and routinely assess the noise levels on each project site. Where necessary any remedial actions are to be considered in the following order:

- Elimination – completely eliminate the source
- Substitute – substitute the source of the noise with a less audible alternative
- Control - isolation & enclosure using physical barriers and/or movement of the source
- Training – further information and training where necessary

Results of any noise assessments carried out by DGUK are to be made available for inspection by regulating authorities should they request them

### Odour

It is the intention of DGUK to regularly assess odour levels on each project site. Where necessary any remedial actions are to be considered to be considered in the following order:

- Elimination – completely eliminate the source
- Isolation – where possible, isolate the source
- Enclosure of the process – where possible, e.g. using sheeting to cover materials
- LEV (local exhaust ventilation) - where possible
- Good Housekeeping – Clean area of the source
- Training – further information and training where necessary

### Dust

It is the intention of DGUK to regularly assess the dust levels on each project site. Where necessary any remedial actions are to be considered in the following order:

- Elimination – completely eliminate the source
- Isolation – where possible, isolate the source
- Enclosure of the process – where possible, e.g. using sheeting to cover materials
- Good Housekeeping – keep the area clean and tidy
- Control – by damping down the area
- Training – further information and training where necessary

### Light

It is the intention of DGUK to regularly assess the light levels on each project site. Where the levels of light may cause a disturbance, remedial actions are to be considered in the following order:

- Elimination – completely eliminate the source e.g. if possible, switch off
- Isolation – where possible, isolate the source
- Enclosure of the process – where possible, e.g. using sheeting or other physical barriers to shield the light
- Training – further information and training where necessary

# WAMITAB

WASTE MANAGEMENT INDUSTRY TRAINING AND ADVISORY BOARD

CERTIFICATE No: 07349

## CERTIFICATE OF TECHNICAL COMPETENCE

*This Certificate confirms that*

Leon Pilling

has demonstrated the standard of technical competence required for the management  
of a facility of the type set out below

*Facility Type:*

Level 4 in Waste Management Operations -

Managing Treatment Hazardous Waste (4TMH)



Authorising Signatures:

Director General \_\_\_\_\_

Director \_\_\_\_\_

Date of Issue: \_\_\_\_\_

January 2006



# WAMITAB

WASTE MANAGEMENT INDUSTRY TRAINING AND ADVISORY BOARD

CERTIFICATE No: 07348

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*This Certificate confirms that*

Leon Pilling

has demonstrated the standard of technical competence required for the management  
of a facility of the type set out below

*Facility Type:*

Level 4 in Waste Management Operations -

Managing Transfer Hazardous Waste (4TSH)



Authorising Signatures:

Director General

Director

Date of issue: 06 January 2006



SCOTTISH  
QUALIFICATIONS  
AUTHORITY



Waste Management Industry  
Training & Advisory Board

---

This document is issued to certify that

**Leon Pilling**

has achieved the

**Scottish Vocational Qualification**

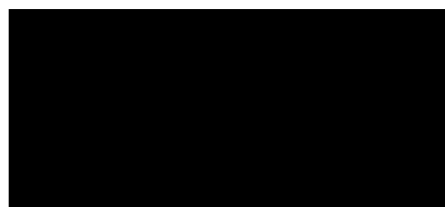
**Waste Management Operations: Managing Transfer Hazardous Waste**  
at Level 4

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Chief Executive  
Scottish Qualifications Authority

Scottish Candidate Number: 001345338



Director General  
Waste Management Industry  
Training and Advisory Board

Issued: 16 December 2005





**SCOTTISH  
QUALIFICATIONS  
AUTHORITY**



**Waste Management Industry  
Training & Advisory Board**

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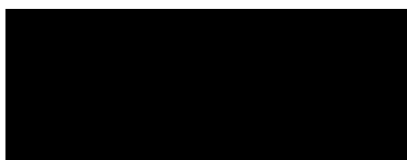
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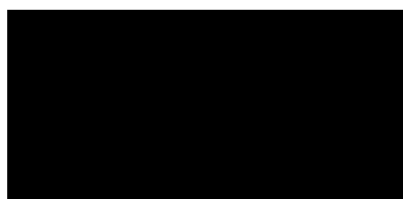
**Waste Management Operations: Managing Treatment Hazardous Waste  
at Level 4**

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**Chief Executive  
Scottish Qualifications Authority**

Scottish Candidate Number: 001345338



**Director General  
Waste Management Industry  
Training and Advisory Board**

Issued: 16 December 2005





# Deployment Form

## Mobile Treatment Licence



**Environment  
Agency**

The Environmental Protection Act 1990  
The Waste Management Licensing Regulations 1994

Mobile Plant Licence Number EAWML

60039

**Facility type:** Mobile treatment plant for the treatment of contaminated material, substances or products, for the purpose of remedial action with respect to land or controlled waters.

### For Environment Agency use only

Licence holder

Title	
First name	
Last name	

Licence holder's address

Postcode	

Operating site address

Postcode	

Contact name

Title	
First name	
Last name	

Contact address

Postcode	

Contact numbers

Phone	
Fax	
Mobile	

Email	

Deployment form agreed

- ☐ No  
☐ Yes

Date (DD MM YYYY)

--	--	--	--	--	--	--

Name/designation

--

### 1 Introduction

1.1 Prior to using your Mobile Treatment Licence (MTL) at a site, a deployment form must be completed and submitted to the Environment Agency, with any necessary additional information. Only once the Environment Agency has given its express agreement in writing to this deployment form, can contaminated materials, substances or products be stored or treated at the site (referred to as the 'operating site').

1.2 Once agreed in writing by the Environment Agency, the terms of this deployment form must be complied with. Amendments can be made to the details contained in this deployment form, but can only be acted upon if the Environment Agency has first agreed to the amendment in writing.

1.3 Your MTL conditions refer to an agreed deployment form, which makes this deployment form a legally enforceable document. If you were to breach an MTL condition, this could lead to the Environment Agency carrying out appropriate enforcement action. This may include prosecution, suspension of the MTL or revocation of it, in part or in full.

1.4 All sections of this deployment form must be completed.

1.5 You may complete as many deployment forms as you wish. This allows you, as the licence holder, to operate under the one MTL on as many sites as there are deployment forms agreed in writing with the Environment Agency.

1.6 Only the mobile treatment processes specified in the MTL can be carried out using your MTL. This may be one of the listed activities, all of the listed activities or a combination of the activities.

11 JUL 2006

Jason, dan



**2 Licence holder****2.1 Who is the holder of the MTL?**

DEEP GREEN (UK) LTD.

**2.2 What is the reference number stated on the MTL?**

EAWML50039

**2.3 Address details of licence holder****Address**

EMBAGGY HOUSE  
5TH FLOOR  
QUEENS AVENUE, CLIFTON  
BRISTOL  
Postcode BS8 1SB

**Contact name**

Title MR.  
First name ANDY  
Last name WHEATLEY

**Contact numbers**

Phone 0117 311 1250  
Fax 0117 930 4222  
Mobile [REDACTED]  
Email ANDY.WHEATLEY@DEEPGREENUK.COM

**2.4 Name, address and contact details of the agent who is completing this deployment form on behalf of the licence holder. (The Environment Agency requires formal notification from the licence holder confirming that the agent is acting on their behalf before considering this deployment form.)****Agent name**

Title  
First name  
Last name

**Address**

Postcode

**Contact numbers**

Phone  
Fax  
Mobile  
Email

**3 The operating site**

Provide the full address of the site where the treatment plant is to be deployed, including the postcode, and ten-character grid reference (for example, GD 1234 5678) where there is no postcode.

**Address**

THE FORMER W. H. KEYS SITE  
CHURCH LANE  
WEST BROMWICH  
Postcode B71 1BN

**Grid reference**

NO 4000 2928

**4 Site plan****4.1 Attach a site plan to this deployment form.**

The site plan must be dated and have an appropriate reference number. It must be drawn accurately to a defined scale with the following information clearly and accurately marked:

- operating site boundary (outlined in red)
- security and access arrangements (including additional details where alternative security, other than that specified in the licence, is to be provided (for example, containerised unit and buried pipework), or where others are responsible for site security of a larger redevelopment scheme and you are relying on that security for your plant)
- areas of contaminated material, substances or products for remediation by the mobile plant
- location/siting of principal plant and equipment
- process treatment and storage areas, including any buildings, bays and fixed tanks, areas of hard standing, areas of impermeable pavement and sealed drainage systems
- drainage systems for the operating site, including all interceptors, sumps and discharge points
- proposed location of pollution control measures
- proposed location of monitoring facilities
- potential receptors, for example, housing
- protected sites (SACs, SPAs, Ramsar, SSSI sites) within 2 km.

**4.2 What is the reference number of the site plan and its date?****Reference number**

DRG/MARCIY101/0706

**Date (DD MM YYYY)**

09/07/2006

**5 Protected sites**

If any protected site is within 2 km of the operating site, specify why the site is protected or designated and what additional control measures are needed to ensure that the site will not be adversely affected by the licensed activities at the operating site.

**5.1 Name of site**

NONE

**5.2 Distance and direction from operating site**  
(for example, 1500 m NNW)

—

**5.3 Why the site is protected/designated**

—

**5.4 Additional control measures**

(for example, great crested newts – provision of newt fencing to prevent access to the operating sites)

—

**5.5 Are there any other activities within the vicinity that in combination with your proposed activity could have a significant adverse affect on the protected site?**

- ☐ No  
☐ Yes. Please provide a description of that activity/activities

—

**6 Specified activities to be carried out at the site****6.1 List the authorised treatment technology, or technologies, that are to be carried out at this operating site.**

THERMAL DESORPTION

Continue at top of next column if necessary

**6 Specified activities to be carried out at the site continued****6.2 Are there any activities listed which are not contained in your MTL?**

- ☒ No  
☐ Yes. Please provide details (a modification to your licence may be required)

**7 Other authorisations**

**Important note** – compliance with the conditions of your MTL does not necessarily mean that you are in compliance with other regulatory authorisations (for example, the use of the mobile treatment plant may require planning permission in its own right). You are directed to discuss this issue with the relevant planning authority in whose area the plant is to be operated.

**7.1 Please identify what other authorisation(s) may be needed in association with the authorised treatment technologies.**

Authorisation	Yes	No
Planning permission	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Trade effluent discharge consent to dispose of liquids to foul sewer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Discharge consent to dispose of liquids to a water course	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater authorisation to dispose of treated waters to groundwater	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Abstraction licence for the use of ground or surface waters (specify if the extraction will be less than 20 cubic metres per day)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other – please specify		







## 10 Risk screening

**10.1** Having produced and considered the CSM, are there any risks associated with the mobile treatment process that are not adequately covered by the standard licence?

☐ No

☒ Yes **SEE ATTACHED DOCUMENTS.**

You may find it useful, prior to answering this question, to complete the site-specific monitoring plan of this deployment form, for example, air emissions, groundwater, surface water, soil gas.

Example of a tabular site conceptual model

Source	Pathway	Receptor	Proposed control	Is this covered by the MTL?
Contaminant A	Ingestion	Human	Site security	Yes
Contaminant A	Run off	Stream	Bunding of storage and treatment area	Yes
Contaminant B	Groundwater	Groundwater and hydraulically connected stream	Storage and treatment on impermeable pavement	Yes
Breakdown product A				
Breakdown product B				
Emission A				
Emission B				
Waste residue A				
Waste residue B				
Treated material				
Reagent 1				
Reagent 2				
Other (?)				

**Note:** the production of the conceptual model is to inform the decision-making process relating to monitoring and control. It is not necessary to identify every daughter compound where it can be adequately covered by a representative indicator parameter or where the breakdown products are so numerous the value of the conceptual model would be lost because of it becoming unwieldy.

## 11 Risk assessment

**11.1** Attach the site-specific risk assessment associated with the remedial action covered by the MTL that you have carried out for the site.

**Important note:** the Environment Agency account manager will only have regard to issues that are pertinent to this deployment form.

## 12 Proposed additional control measures

**12.1** Where control measures to mitigate identified risks are needed in addition to those in the MTL, please specify them in a continuation sheet and attach it to this deployment form.

## 13 Monitoring plan

**13.1** Attach a monitoring plan for groundwater, surface water, soil gases and air emissions to this deployment form.

This must include:

- Baseline monitoring programme
- Trigger levels for indicator parameters
- The construction of the monitoring point
- The location of the monitoring points
- Monitoring protocol
- Frequency of monitoring

## 13 Monitoring plan continued

- Experience and qualifications of personnel carrying out the monitoring and the personnel responsible for interpreting and acting upon the results of monitoring
- Emissions action plan (the action to be taken if an agreed trigger level is exceeded).

**Note:** all or parts of the above may have already been completed for the operating site for other purposes, for example, development control, existing PPC installation. Where relevant and appropriate, this may simply be incorporated in the deployment form submission and hence reduce duplication of effort.

The Environment Agency considers that the provision of baseline monitoring is extremely useful in regulating a site and for the operator in managing it effectively. However, in certain circumstances the value of obtaining such data can be diminished. The requirement for baseline monitoring may be waived where there are unlikely to be other emission sources similar to that of the activity to be carried out or, at the other end of the scale, where activities already being carried out would adversely affect the value of obtaining background monitoring, for example, excavation of soils containing VOCs. Also, the requirement may be waived where time constraints are such that baseline monitoring would significantly hinder the deployment of the treatment plant. Operators need to be aware that where baseline monitoring has not been carried out, the Environment Agency may look to them in the first instance if there are issues associated with emissions.



**14 Indicator parameters**

14.1 Specify the indicator parameters and justify why they are the most appropriate to detect pollution of the environment or harm to human health.

*See Attached*

**14 Indicator parameters *continued***

Indicator	Justification
for example, chloride	Most persistent pollutant on the operating site
for example, vinyl chloride	Daughter product

**15 Reporting of monitoring results**

15.1 Monitoring results must be reported in a clear format which must include the trigger level (where appropriate) for the parameter that has been monitored.

*See Attached*

Example monitoring format

Determinant	Result	Units	Trigger level	Unit

**16 Pollution control – dusts, fibres, particulates, vapours, gases, aerosols and odours**

16.1 How are dusts, fibres, particulates, vapours, gases, aerosols and odours from the treatment process to be monitored, contained, collected and treated to prevent pollution of the environment, harm to human health and serious detriment of the amenities of the locality?

*This is the task of the gas cleaning system of the plant.*

*Organic contaminants are thermally oxidised and particulates controlled via cyclones and a baghouse.*

*There are no process residues from the operation requiring disposal.*

*Continue on a separate sheet*

**17 Acceptance procedures**

17.1 Please supply details of the procedure to be adopted at the site to ensure only those materials that are treatable with the specified technology will be treated.

Acceptance procedure

*Only material on-site is to be treated. The site has been subjected to a detailed assessment*

17.2 Detail how materials that are found which cannot be treated by the specified technology are to be handled at the site. This should include a segregation area and procedures for its removal within a specified timeframe.

*Contractually such material is the responsibility of the Client. It will be segregated for appropriate disposal.*



**18 Quarantine area**

**18.1** Specify the maximum quarantine capacities for the designated quarantine storage areas, bays or containers for those contaminated materials, substances or products which will be stored on the operating site awaiting removal or re-testing (the location(s) of which should be identified on the plan required above).

*Your licence requires quarantined materials to be removed within seven days or other date as agreed with the Environment Agency.*

Maximum quarantine capacities for the designated quarantine storage areas, bays or containers

The quarantine area will be on hard-standing and will be approximately 20x20m. This will allow 600m<sup>3</sup> to be stored.

**19 Commissioning, operating and maintenance**

**19.1** Attach details of commissioning, operating and maintenance including documentation and record-keeping, to ensure that emissions from the process do not cause pollution of the environment, harm to human health or serious detriment to the amenities of the locality.

**19.2** Only the materials necessary to complete commissioning are allowed to be treated until a validation report, prepared by a suitably qualified person, for example, engineer, microbiologist (dependent upon the technology), has been provided to the Environment Agency demonstrating that commissioning has been successfully achieved.

**Important note:** the scope of the MTL regime is such that it does not relate to the quality of the recovered soils or waters.

The Environment Agency account manager does not need to agree that commissioning has been successful. It is for the licence holder to comply with the conditions of the MTL during commissioning operations.

**20 Quantity measurement systems**

**20.1** Specify how the quantity of contaminated materials, substances or products is to be measured. If conversion factors are to be used, specify how the conversion factor(s) has been derived.

Measurement method, for example, site weighbridge

Belt or hopper weigh mechanism

Conversion factor to be used (and justification)

N/A

**20 Quantity measurement systems continued**

Total amount to be treated at the operating site

45,000 tonnes

Quantity and units

45,000 tonnes

**21 Control of noise**

**21.1** Specify how you are going to minimise noise at the site, for example, strategic site layout, screening, temporary bunding.

**21.2** Attach details of a noise monitoring plan including:

- Baseline monitoring programme (see note above)
- Trigger levels for noise
- The location of monitoring points
- Monitoring protocol
- Frequency of monitoring
- Experience and qualifications of personnel carrying out the monitoring and the personnel responsible for interpreting and acting upon the results of monitoring
- Emissions action plan (the action to be taken if an agreed trigger level is exceeded)

**Important note:** the noise control and monitoring plan will be different for different remediation technologies and combinations of technologies. It may be that a noise control and monitoring plan has already been agreed with the local authority for the operating site. If so, it is more than likely that this will be satisfactory for this deployment form.

**22 Control of odours and VOCs**

**22.1** Detail how odours and VOC emissions are to be controlled at the operating site.

Your licence requires that if odours and VOCs are likely to be generated during treatment they need to be controlled. Detail the measures you will take to do this – this includes management of stockpiles.

See Attached



### 23 Monitoring and control of pest infestations, scavengers and litter

23.1 Is the nature of the material that is to be stored and treated such that it will contain substances that will attract pests or scavengers, or is likely to release litter?

- ☒ No
- ☐ Yes. Please specify which, and how you intend to inspect for, and control, pests, scavengers and/or litter at the operating site (for example, litter – weighed down by heavier material, not handled during windy conditions)

### 24 Minimum staffing and supervision

24.1 Specify what treatment methods can be operated without supervision, and why this is the case. This may also include the provision of automated and telemetric systems.

*Some types of treatment techniques can operate all day and night without having any effects, whereas physical disturbance (for example, windrow turning) will have.*

During treatment operations two personnel will be present.

### 25 Duration of this deployment form

25.1 What is the duration (specified period) that this deployment form is required for the operating site?

*This may be a specified date or identifiable event. The specified period may be extended if agreed in writing by the Environment Agency. The one deployment form should be completed even when it is anticipated that there may be several distinct phases to the remediation activities which may be separated in time. Operators should have regard to any activities that will be carried out in relation to 'rebound' associated with the technology.*

Duration

12 MONTHS

Anticipated periodic breaks

None.

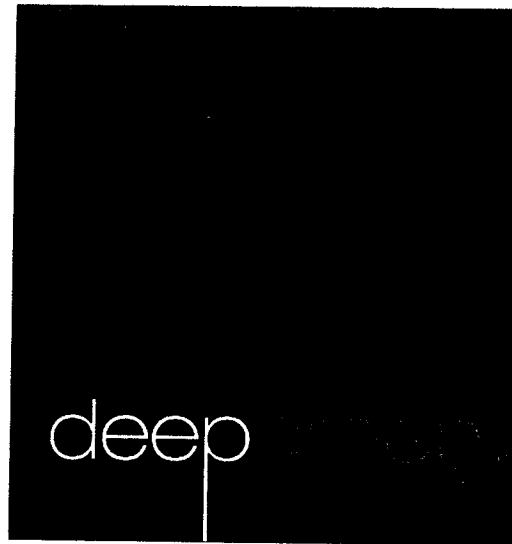
### 26 The Data Protection Act 1998

The information provided by yourselves will be processed by the Environment Agency to deal with your application, to monitor compliance with the licence/permit/registration conditions, to process renewals, and for maintaining the relevant public register(s).

We may also process and/or disclose it in connection with the following:

- offering/providing you with our literature/services relating to environmental matters;
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive Local Authorities, Emergency Services, Defra) on environmental issues;
- carrying out statistical analysis, research and development on environmental issues;
- providing public register information to enquirers;
- investigating possible breaches of environmental law and taking any resulting action;
- preventing breaches of environmental law;
- assessing customer service satisfaction and improving our service; and
- responding to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, where the Data Protection Act allows.

We may pass it on to our agents/representatives to do these things on our behalf.



**Supplementary Information in  
Support of Deployment Form**

**WH Keys, Church Lane,  
West Bromwich, B71 1BN**

**July 2006**





## INDEX

1.	Conceptual Site Model.....	3
2.	Risk Screening .....	6
3.	Risk Assessment .....	6
4.	Proposed Additional Control Measures .....	6
5.	Monitoring Plan .....	6
	Noise .....	6
	Air Emissions from the Oxidising Unit .....	7
	Runoff from the stockpile of treated material.....	7
	Dust.....	7
	Odour .....	8
	Emissions Action Plan .....	8
6.	Indicator parameters.....	8
7.	Reporting of Monitoring Results .....	8
8.	Pollution Control.....	8
9.	Acceptance Procedure.....	9
10.	Quarantine area .....	9
11.	Commissioning, Operating and Maintenance.....	9
12.	Quantity Measurement System .....	13
13.	Control of Noise.....	13
14.	Control of Odours and VOCs .....	13
15.	Monitoring and control of pest infestations, scavengers and litter .....	14
16.	Minimum staffing and supervision .....	14

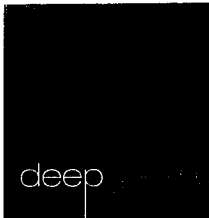


## **1. Conceptual Site Model**

The plausible pollution linkages that may exist at the site are identified below in tabular form. The CSM has been developed to inform the scope of the risk assessment for the site, which in turn has been used to identify if any additional control measures, which are not already detailed in the licence, are needed or not.

The proposed controls are listed in order of application. Subsequent control measures will be used if the first level of control is not adequate given the site conditions at the time e.g. increasing wind speed and strength.

Note: The plant will be located on impermeable hard standing which will be inspected, and repaired if necessary. Contaminated runoff will be directed to a storage facility and subsequently treated in the plant.



Source	Pathway	Receptor	Proposed control	Is this covered by the MTL
Excavation of contaminated soils	Not Applicable (NA)	Not Applicable	Outside of DGUK area of control	NA
Stockpile of excavated contaminated soil	NA	NA	Outside of DGUK area of control	NA
Pre-treatment operations: Dust	Wind	Humans Residential Industrial Units Road traffic	– 1. Damping down 2. Covering 3. Limiting work during extreme weather conditions	Yes
Pre-treatment: Noise	Air	Humans Residential Industrial Units	– 1. Location of unit on site. 2. Screening 3. Acoustic housing	Yes
Loading shovel	Air	Humans Residential	– Noise abatement measures could be adopted at certain hours, using safe systems of work with appropriate Health and Safety approval.	Additional control measure
Thermal Desorption Unit (TDU): Dust and noise	Wind	Humans Residential Industrial Units Road traffic	– 1. Damping down 2. Covering 3. Limiting work during extreme weather conditions	Yes
TDU: Off gases	Air	Humans Residential Industrial Units	– Oxidising Unit	See risk assessment
TDU: Quench waters	Run off	Groundwaters	Impermeable pavement drained to collection point and such waters re-introduced to plant.	Yes



Treated material: Dusts	Wind	Humans Residential Industrial Units	-	1. Damping down 2. Covering 3. Limiting work during extreme weather conditions 4. The material is re-engineered once treated under Main Contractors control	Yes
Un-suitable materials: Dusts	Wind	Humans Residential Industrial Units	-	1. Damping down 2. Covering 3. Immediate removal from site	Yes
Un-suitable materials: Leachate	Runoff	Groundwater		1. Impermeable pavement drained to storage area. 2. Immediate removal from site	Yes
Soluble contaminants: Pre-treatment / treatment / storage of treated material	Made ground / permeable strata	Groundwater		Impermeable pavement drained to storage area.	Yes
Fuel Oil	Made ground / permeable strata / runoff	Groundwater		Stored in impermeable tanks within bunded area	Yes
Maintenance: Lubricating oil	Made ground / permeable strata / runoff	Groundwater		Only quantities suitable for the intended job are used at any one time. If spilt the spilled oil will be cleared up immediately.	Yes
Odour	Air	Humans Residential Industrial Units	-	Odorous material will be: 1. Covered 2. Blend with other material 3. Odour mask / neutraliser employed.	Yes



## **2. Risk Screening**

The control measures contained within the licence and this SSWP are sufficient to ensure that the operations will not cause pollution of the environment, harm to human health or serious detriment to the locality.

## **3. Risk Assessment**

See attached risk assessment in Appendix A.

## **4. Proposed Additional Control Measures**

The control measures contained within the licence and this SSWP are sufficient to ensure that the operations will not cause pollution of the environment, harm to human health or serious detriment to the locality.

## **5. Monitoring Plan**

Having considered the site specific risks associated with the proposed operation the scope of the monitoring plan for the site relates to:

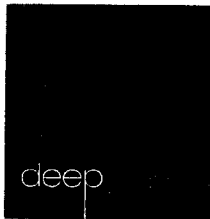
- Noise
- Air emissions from the oxidising unit
- Runoff from the treated stockpile
- Dusts
- Odours

Surface and groundwater and soil gases monitoring are not required given that the operation is ex-situ and located on low permeable surface with runoff collected, stored and treated.

### **Noise**

A noise survey of background levels has been undertaken by specialists on behalf of the Client and DGUK. This indicates noise levels from the operation will be acceptable.

Noise will be routinely monitored at all site boundaries. Initially this will be undertaken by the project manager (WAMITAB certificated) to ascertain if noise levels from the plant are excessively high or likely to cause a nuisance. Depending upon the results, appropriate action to undertake an additional noise survey by a qualified technician to monitor actual levels will be considered. Subject to results mitigating measures such as reconfiguring the plant layout, employing a screen, or housing certain equipment in containers with



better acoustic properties will be undertaken. Subsequent monitoring will be by a specified technician.

The frequency of monitoring will be daily for the first two weeks of operation and thereafter weekly.

Once one-off operations such as plant erection and set up have been completed and routine operations commence a further noise survey will be undertaken to measure actual noise against the pre-operation assessment and appropriate actions taken as a consequence.

Note: The noise generated by thermal desorption plant is not significant and in particular in this case mains electricity will be used.

### **Air Emissions from the Oxidising Unit**

Continuous monitoring will be undertaken for the following parameters:

- SO<sub>x</sub> – to ensure sufficient lime is being used
- NO<sub>x</sub> – ensure adequate combustion of the fuel being used
- CO – to ensure that complete combustion is being achieved
- CO<sub>2</sub>/Oxygen – to ensure there is sufficient oxygen for combustion

The sensors used are attached to the oxidising unit. A fully automated system including data logging is used.

Gas samples are taken during the commissioning phase and at approximately every 10,000 tonnes of material treated. These are sent to an independent laboratory for chromatograph analysis. These gas samples are used to determine the levels of marker emissions (as listed above) that signify complete treatment is being achieved and emissions are acceptable.

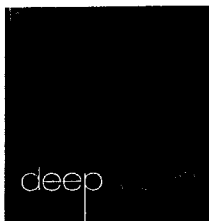
Reprocessed fuel oil will be used and therefore WID limits will be maintained.

### **Runoff from the stockpile of treated material**

Only visual monitoring will be undertaken to ensure the run off drains to a storage location. This will be checked during excessive periods of rain by a specified technician. If necessary, samples will be taken to determine the appropriate management route for this material.

### **Dust**

As part of the daily tasks, visual monitoring will be employed to determine that fugitive dusts are not released from the operating plant or the treated soils that are stockpiled.



This will be done by a specified technician and the results of the monitoring recorded. If such emissions are apparent, the Chief Engineer will determine whether immediate remedial measures are necessary (i.e. the dust may present a hazard or nuisance) or whether the plant can be repaired at the next scheduled maintenance period.

## **Odour**

Olfactory monitoring will be conducted on a daily basis by a specified technician.

Personnel carrying out the monitoring will be suitably qualified and experienced in the monitoring required, the interpretation of the results and necessary action to be taken.

## **Emissions Action Plan**

The following actions may be undertaken, following an investigation of the root cause and that cause being attributable to DGUK activities:

Noise	Screen equipment, relocate equipment, acoustic housing, assessing plant reversing beepers
Emissions	SOx – alter lime feed NOx – alter fuel feed CO – alter combustion process CO <sub>2</sub> /Oxygen – increase oxygen supply to oxidising unit Dust – change filter
Runoff	Cover stockpiles
Dust	Damp down, cover, reuse material
Odour	Cover, blend with other material, remove material, neutraliser / odour masks

## **6. Indicator parameters**

The indicator parameters are those detailed above.

## **7. Reporting of Monitoring Results**

The results of the monitoring plan detailed above will be submitted to the EA every 2 months.

## **8. Pollution Control**

The monitoring, containment, collection and treatment of dusts, fibres, particulate, vapours, gases, aerosols, and odours are covered in the above sections, in that the controls to be



employed in relation to dusts from the plant equally applies to “particulates and fibres” e.g. cyclones and baghouse. The oxidation unit controls off-gases including “vapours, gases and aerosols”. Odours are dealt with as above.

## **9. Acceptance Procedure**

The site to be remediated is a former chemical and bitumen. Thermal desorption has been used successfully to remediate bitumen wastes with associated contaminant types in the United States and Europe since the 1980's.

DGUK has had sight of site investigation data detailing the degree of contamination and contaminants present. The contaminants and soil structure are suitable for thermal treatment using DGUK plant.

The Client will excavate and screen the material, removing oversize inclusions that are too large for treatment in the plant. The stockpile will therefore be homogenized to a large extent by this process.

Mar City will deliver material to the TDU during daylight hours and DGUK outside of these times. DGUK does not take ownership of the material it accepts for treatment. Any unsuitable material that is outside of the agreed specification will be returned to the Client.

In the event of material arising, within DGUK's area of responsibility, that is considered particularly hazardous, EA will be notified and an appropriate procedure to deal with it agreed. The material will be stored appropriately pending a decision.

## **10. Quarantine area**

A designated quarantine area is identified in the attached map where un-suitable material, if any, may be stored pending a decision on what to do with it.

## **11. Commissioning, Operating and Maintenance**

### **Commissioning Plan**

Commissioning comprises of a series of checkups and tests of equipment:

1. Completion check up – the responsible technician will inspect the plant for:
  - Completion of the plant construction – all parts are installed
  - Finishing of the work – all installation works has been finished
  - Safety aspects – all protection equipment has been installed
  - Site preparedness – the site is clean of debris and safe for work
2. Mechanical test – all mechanical parts of the plant will be started and the responsible technician will inspect the plant for:





- Smooth operation of each equipment
- Function of the logical circuits
- Function of safety circuits

3. Test Burn — the plant will be started and the responsible technician will inspect the plant for:

- Proper function of the plant
- Smooth throughput of material through the plant
- Proper function of the gas cleaning system

A protocol summarising the commissioning process will be prepared by the responsible technician of the company.

### **Operational Plan**

The modular nature of the thermal desorption process means that parts can differ from project to project. Typically they consist of the following:

- Feeding system
- Rotary desorber (kiln)
- Soil cooler and
- Gas cleaning system.

Contaminated material is excavated from its original site and pre-treated. Pre-treatment normally consists of screening material on a sieve up to 40mm. Within pre-treatment undesired material such as wood, plastic, steel and others that may cause operational problems in the plant are removed.

After pre-treatment the material can be fed in to the plant. This is done by means of a loading shovel or other plant. Material is loaded in to the feeding hopper. From there it is transported in a continuous flow and at a pre-selected rate into the rotary desorber. The feeding system consists mainly of conveyor belts, hoppers, scalping screen and a magnetic separator.

The Rotary Desorber is a horizontal cylindrical revolving drum with a length ranging between 5 to 15 m and a diameter up to 3m. It is inclined at an angle of some 5° to encourage the material to progress through the desorber as it rotates. An internal heat source is provided by burners (using reprocessed fuel oil or gas) to raise the temperature of the soil. As the soil reaches the designated temperature (dependant on the boiling point of the predominant contaminants, but temperatures up to 550°C are achievable), the contaminants volatilise and are transported in to the gas cleaning system for further treatment. As the soil exits the kiln at up to 500°C it is free of any organic pollution.

The cleaned soil then passes into the soil cooler. Its purpose is to mix clean hot soil with water to reduce the temperature of the soil prior to leaving the plant. Normally, the soil is cooled down to less than 100°C.



The plant is maintained at a pressure slightly less than atmospheric to minimise the possibility of fugitive emissions. All gases originating from the desorbing process in the rotary desorber are transported to the gas cleaning system by suction generated by the main fan. The gas cleaning system design has three parts: oxidising chamber, baghouse and main fan.

The oxidising chamber is a cylindrical steel drum equipped with internal insulation and burner able to maintain a temperature in excess of 1100 °C. The exact temperature required will again depend on the range of contaminants in the gas stream. Gases pass through the chamber and remain there for at least 1 second. The combination of temperature and residence time provides for complete oxidation of all organics components.

As the gases exit the rotary desorber they can carry considerable amounts of dust. This dust has to be removed from the gas stream before it can be released to atmosphere. This is achieved using a fabric filter (baghouse) which is similar in principle to a bagged vacuum cleaner. The baghouse is normally a mild steel box with an inlet and outlet. Gas enters the baghouse, is reduced in velocity through expansion and passes through the fabric of filter bags. This fabric stops the particulates from moving on to the clean side of the baghouse. From there the dust free gas stream is taken to the oxidising unit for release to atmosphere.

The last part of the equipment is the main fan. Its purpose is to keep all the technology at a slight negative pressure compared to atmosphere and provide a draft for the process gases to travel through the gas cleaning system. An axial fan is usually employed with a displacement of at least 70 000 m<sup>3</sup> per hour.

Constant monitoring of the gases prior to release is undertaken by in-line sensors. The parameters monitored are SO<sub>x</sub>, NO<sub>x</sub>, CO and O<sub>2</sub>. The sensor readings are automatically recorded on a data logger.

As the desorption unit works at high temperature, it is necessary to bring it from cool status to operational conditions gradually to avoid any undesired material heat stress. Treatment cannot begin until operating temperatures are achieved. This is costly in fuel and is the primary reason why thermal desorption operations are always undertaken on a 24-hour basis.

Before the start sequence is launched, the Project Manager or control room operator confirms that the plant is ready and safe to be operated. The start sequence protocol is a complex set of procedures that need to be undertaken in turn to ensure the plant is brought up to temperature without damage.

The control room operator maintains a record of all activity in the site diary.

The control room operator is responsible for maintaining operational parameters within specification. Some of the parameters are controlled and maintained by automatic feedback systems e.g. the oxidising chamber temperature, and baghouse inlet temperature. Others are maintained manually by the control room operator who is able to make adjustments in light of the soil parameters (e.g. feed rate, main fan throughput, soil outlet temperature.)



The plant also has safety circuits that will automatically shut the plant down in the event that certain parameters exceed control limits. These safety controls exist to prevent harm to humans, the environment and the plant itself.

Typical operational parameters:

Desorber soil outlet temperature	450°C – 500°C
Desorber negative pressure	Slight negative pressure
Oxidising chamber temperature	Up to 1100°C dependent upon contaminants present and determined via commissioning data
Oxidising chamber negative pressure	Negative pressure
Baghouse inlet temperature	160°C - 180°C

Operational parameter recording is done by completing the DGUK data sheet every 30 minutes or at any time significant adjustment of the plant.

The plant can be shut down by the operator using a standard shut down routine to make the plant safe. Alternatively, a partial shut down can be affected if maintenance or repair of a part of the system is required. Partial shut down allows the temperatures to be maintained whilst work can be undertaken on the feeding system, rotary desorber, cooling system or soil transportation equipment.

Other equipment will be operated on site to service the project. This equipment will include power generator, air compressor and loading shovel. Analysers and testing equipment will also be used. All of this equipment will be delivered to site with appropriate operational and maintenance manuals.

## Maintenance Plan

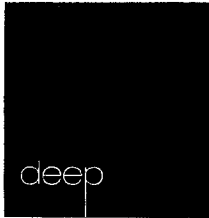
The maintenance of the plant is an important part of the daily duties of the staff. Maintenance is focused on keeping the plant in a safe state for operational personnel and the environment. The project manager is responsible for ensuring the DGUK maintenance standards.

DGUK's maintenance programme consists of the following three levels:

1. Daily maintenance
2. Routine maintenance
3. Corrective maintenance

Daily maintenance is a routine activity carried out during every operational shift. It is focused on maintaining plant performance through mechanical maintenance and lubrication. The philosophy is that critical items of equipment are checked frequently and their performance assessed.

If any observations indicate a possible degradation of the component, corrective action will be taken immediately by the Project Manager or appropriate control room operator.



Routine maintenance is a regular activity carried out on plant that has been shut down and allowed to cool. Such shut-downs are scheduled; however the exact timing can vary according to operational requirements.

The program for routine maintenance is influenced by the requirements of the operational manual and the feedback from daily plant inspection reports.

Corrective maintenance is always concentrated on precise identification of the problem, its assessment and correction or repair. Correcting the issue must be done in such a way, that it provides for safety of the persons undertaking the repair as well as safe operation for plant until the routine maintenance can be effected.

## **12. Quantity Measurement System**

The weight of material fed into the desorption unit will be weighed directly. This may be either in the hopper or the conveyor belt.

## **13. Control of Noise**

The impact of noise will be minimised by locating the plant away from the housing to the western end of the site.

DGUK propose to operate 24 hours per day. This provides the shortest possible operational time on site.

Acoustic housing will be employed where appropriate and necessary and safe to do so, as will screening of operations.

The routine maintenance schedule will ensure that equipment operates efficiently.

If the loading shovel is found to be a cause of noise nuisance because of the reversing beeper DGUK will seek approval to adopt an alternative safe system of work.

The trigger for action will either be complaints from the general public or local authorities, or when noise monitoring indicates noise at domestic dwelling reaches WHO Guidelines for Community Noise standards. Noise will be assessed daily by site staff and by professional companies as regularly as required.

## **14. Control of Odours and VOCs**

The main release of odours and VOCs is expected to be from the excavation of the contaminated soils and its stockpile which is being carried out by the Client. Any odours or VOCs from the DGUK's operation will be controlled as detailed above.



## **15. Monitoring and control of pest infestations, scavengers and litter**

It is not envisaged that the proposed thermal treatment operation will give rise to pests, scavengers or litter. The only source of material that could attract such things are from the on site mess facilities. To this end secure containers shall be used pending collection for off site disposal.

In the extremely unlikely event that such a problem was to occur due to DGUK activities an appropriate pest control contractor, bird scaring devices and litter picking will be employed at the site.

## **16. Minimum staffing and supervision**

During any treatment operations DGUK will have at least two personnel on site.