Appeal Application Form

The Planning Inspectorate

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Date Received
Appeal Ref

The Environmental Permitting (England and Wales) Regulations 2016

Environmental Permitting Appeal Form

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WARNING: **The appeal must reach the Inspectorate with the statutory appeal deadlines as laid out in Schedule 6 of the above mentioned regulations.**

PLEASE PRINT CLEARLY IN CAPITALS USING BLACK INK

A. APPELLANT DETAILS

Name F C C R E C Y C L I N G (U K) L I M I T E D

Organisation Name (if applicable)

Contact reference Number S K 3 7 . 0 4 6

Address 3 S I D I N G S C C U R T W H I T E R C S E W A Y D C N C A S T E R

Postcode D N 4 5 N U

Daytime Tel 0 7 5 9 7 5 2 1 9 9 0 Fax

Email C L A I R E . N C B E S @ F C C E N V I R C N M E N T . C C . U K

I prefer to be contacted by: Email ☒ Post ☐

B. AGENT DETAILS (if applicable)

Name N E M M A C C N W E L L

Organisation Name (if applicable) F R E E T H S L L P

Contact reference Number 8 8 1 0 5 4 7 . 4

Address 1 0 0 W E L L I N G T O N S T R E E T L E E D S

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I prefer to be contacted by: Email ☒ Post ☐

C. REGULATOR DETAILS – ENVIRONMENT AGENCY/LOCAL AUTHORITY

Name E N V I R C N M E N T A G E N C Y

Contact reference Number E P R / N P 3 5 3 8 M F / V 0 0 9

Date of Application (DDMMYY)

Date of Decision (DDMMYY)

D. APPEAL SITE ADDRESS

Site Address OR D A N E S H I L L L A N D F I L L D A N E S H I L L R O A D R E T F

Postcode (if known)

E. GROUNDS OF APPEAL

Please indicate the grounds for appeal by ticking whichever box applies and then set out your reasons in section F of this form.

1.	Refusal to grant a Permit;	**1.**	☐
2.	Refusal to grant a variation of the conditions of an existing Permit;	**2.**	☒
3.	Conditions attached to a Permit following an application for a Permit or variation;	**3.**	☐
4.	Refusal of application to transfer or conditions attached to Permit to take account of transfer;	**4.**	☐
5.	Refusal of application to surrender the Permit or conditions attached to Permit to take account of surrender;	**5.**	☐
6.	Variation, Enforcement, Revocation, Prohibition or Suspension Notice;	**6.**	☐
7.	Refusal of approval to initiate closure procedures or is served with closure notice;	**7.**	☐
8.	Failure by regulator to give notice of determination of application for Permit, variation, transfer or surrender within statutory time-period - 'deemed refusal';	**8.**	☐
9.	Deemed withdrawal of application following failure to provide required information.	**9.**	☐

F. REASONS FOR APPEAL

SEE ATTACHED GROUNDS OF APPEAL

F. REASONS FOR APPEAL (continued)

G. CHOICE OF PROCEDURE

Please choose option 1 , 2 or 3 by *ticking one box only*

Please note that we must also take the Environment Agency's/Local Authority's preference into account when we decide how the appeal will proceed.

√

1. Written Representations
This procedure involves an exchange of the parties' written statements, followed by a visit to the appeal site by the Inspector who is responsible for determining the appeal.

W ☐

You and a representative of the Environment Agency/Local Authority will be given an opportunity to accompany the Inspector during the site visit.

2. Hearing
A hearing is a discussion, held under the direction of the Inspector. It lets parties exchange their views in a less formal atmosphere than at a public inquiry. Hearings are open to the public, and third parties may be heard at the discretion of the Inspector.

Hearings are not usually suitable for appeals that:

- are complicated or controversial and have created a lot of local interest
- require cross-examination of witnesses.

H ☐

Although you may prefer a hearing, the Inspectorate will also consider whether your appeal would be best dealt with at a more formal inquiry or on the basis of written representations.

3. Inquiry
This is the most formal procedure and is usually the best way to deal with a case that involves complex legal issues and or where many third parties have expressed an interest in the case. Expert evidence is often presented at an inquiry and witnesses may be cross-examined. An inquiry will normally take longer than a hearing, and in some cases could continue for several days. It is not a court of law but proceedings may appear to be quite similar. Inquiries are open to the public and third parties may be heard at the discretion of the Inspector.

I ☒

An inquiry will be held if you or the regulator decide that you do not want to use the written representations procedure and we decide that a hearing is unsuitable.

Sometimes even if both parties have opted for the written representations procedure or an informal hearing we may decide to hold an inquiry. If we do, we will tell you why.

If you want us to hold an inquiry please set out you reasons.

"I wish to be heard by an Inspector at an inquiry because...

SEE ATTACHED REQUEST FOR AN INQUIRY STATEMENT

H. ESSENTIAL SUPPORTING DOCUMENTS

The documents listed below, must be sent with your appeal form. If we do not receive all your appeal documents within the statutory appeal period we may not be able to accept it.

Please tick the boxes to show the documents you are enclosing.

		√
1.	Copy of relevant application (if applicable);	**1.** ☒
2.	Copy of relevant Environmental Permit (if applicable);	**2.** ☒
3.	Copy of the Decision or Notice (the subject of the appeal);	**3.** ☒
4.	Copies of any relevant correspondence, plans etc between you and the regulator.	**4.** ☒

I. CONFIRMATION

DECLARATION

I understand that:

a) The Planning Inspectorate may use the information I have given for official purposes in connection with the processing of my appeal;

b) Details from this form, including my name, the site description and my grounds of appeal may appear on the Planning Portal.

By signing this form I am agreeing to the above use of the information I have provided.

I have completed all sections of the appeal form and confirm that the details are correct to the best of my knowledge. (Please Note: signature is not necessary for electronic submissions)

Signature Date (DDMMYY)

Name (in capitals) E M M A C C N W E L L

On behalf of (if applicable) F R E E T H S L L P

For more information about how we process your personal information please see "Environmental Permitting (England and Wales) Regulations 2016 – The appeal procedure guidance."

Please now send this form and all the necessary supporting documents to:

Environment Team, The Planning Inspectorate, 3A Eagle Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN

Or e-mail it to: ETC@planninginspectorate.gov.uk

You also need to send a copy of it to the regulator that issued the Notice.

When we receive your appeal form, we will:

1. Check that the appeal is valid and everything is in order;
2. If everything is in order, we will give you an appeal timetable and **start date**;
3. Inform the regulator of the start date of the appeal (if applicable).

If you submit information or representations late we may be unable to consider them, the Inspector may not see them, and they may be returned to you.

At the end of the appeal process you will receive the Inspector's decision, in writing (including details of the Inspector's reasoning).

J. SUPPLEMENTARY SHEET

Grounds of Appeal

FREETHS

Daneshill Landfill Site

APPEAL PURSUANT TO REGULATION 31 OF THE ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016

REGARDING DANESHILL SOIL TREATMENT FACILITY AT DANEHSILL LANDFILL SITE

GROUNDS OF APPEAL

ON BEHALF OF FCC RECYCLING (UK) LIMITED

Grounds of Appeal

1. INTRODUCTION

1.1. Freeths LLP is instructed to act on behalf of FCC Recycling (UK) Limited ("the Appellant"), in relation to an appeal pursuant to Regulation 31 of The Environmental Permitting (England and Wales) Regulations 2016 ("the Regulations").

1.2. The Appellant is appealing the Environment Agency's ("the EA") refusal of an application to vary environment permit reference EPR/NP3538MF ("the EP") to allow for the treatment of asbestos contaminated soils at Daneshill Landfill Site ("the Site").

2. PROCEDURAL BACKGROUND

2.1. The variation application for the EP was made on behalf of the Appellant, by Caulmert (the Appellant's consultant) on January 2021 ("the Application") and included the proposal to establish a soil treatment facility for the recovery of asbestos contaminated soils at the Site[1] ("the STF"). It should be noted that the STF falls within the Site, but is contained to a smaller area within the same.

2.2. The Application was confirmed to be 'duly made' on 16 July 2021.

2.3. A Schedule 5 Notice was issued by the EA on 6 August 2021 requesting the submission of further information, including extensive information regarding the details proposed for the handling of asbestos contaminated soils.

2.4. A response to a Schedule 5 Notice, served by the EA, was submitted by Caulmert on 1 October 2021 ("the Response").

2.5. In addition to the Response, an amended Environment Management Plan ("the October EMP") was also submitted (updating the first version of the EMP submitted in January 2021). The October EMP made clear that 'reference background levels'[2] of respirable asbestos fibres in air would be ascertained by pre-operational baseline monitoring prior to any works being undertaken, with the operational techniques (in

[1] The Application also proposed the STF would treat other hazardous waste streams and this aspect of the Application was approved by the EA.
[2] As defined in the October EMP

compliance with BAT) ensuring (via the proposed rigorous monitoring strategy) that no increase of asbestos would occur over and above 'reference background levels'.[3]

2.6. Following submission of the Response, the EA's officer, Katie Dunmore, informed Caulmert via email dated 25 November 2021 ("the Email") that the Response did not adequately address the Schedule 5 Notice in so far as it related to asbestos management.

2.7. The Email effectively refuses a request from Caulmert for a meeting with Katie Dunmore and Chris Hall (EA Officer) instead directing that: "the operator must reconsider the relevant sections of the Schedule 5 notice highlighted above explaining how BAT will be achieved for the asbestos activity at this location." Reference is also made in the Email to a meeting, "to be held between the operator and their account manager Claire Roberts" and Ms Dunmore goes on to state, "I have flagged our concerns for this application with Claire and I believe this will be raised at the meeting".

2.8. In February 2022, Caulmert provided further information to the EA regarding BAT14 for the proposed treatment and recovery of asbestos contaminated soils ("the BAT14 Document"[4]). Following the submission of the BAT14 Document, Caulmert chased the EA for a response by email dated 27 April 2022 (from Andy Stocks to Katie Dunmore). A response was received from Katie Dunmore, dated 5 May 2022, which stated: "Given we need a wider EA approach to the asbestos screening activity I have referred it to our technical leads. It is in hand, I'll be in touch when a decision is confirmed".

2.9. The next communication from the EA is the email from Katie Dunmore, dated 21 October 2022 ("the October 2022 Email"), and informs Caulmert that draft decisions for the Application have been placed on 'Citizenspace' for consultation until 17 November 2022. The draft decision notice (which is similar in its terms to the final version) indicated that the EA intended to refuse permission for the Appellant to undertake the proposed recovery activity of treating asbestos contaminated soils. In the October 2022 Email, Ms Dunmore goes on to state, "After reviewing the decision and given the level of interest it was considered advertising was the most appropriate course of action. I'll be in touch after the process closes".

[3] See, for example, paragraph 9.1.2, page 26 of the EMP.
[4] See undated document titled, "BAT14".

2.10. The variation for the STF was granted on 2 December 2022 resulting in the amendment of the EP (variation application no: EPR/NP3538MF/V009) ("the Amended EP"). However, the processing of asbestos contaminated soils was specifically excluded from the permitted activities for the STF.

2.11. During the determination process, the EA did not provide any direct feedback or consultation response to the Appellant (or its consultant) from its internal "technical lead". The Appellant's request for a meeting to discuss the technical aspects of the proposed activity was refused. Accordingly, to date, the EA has not disclosed to the Appellant the advice it received from its internal "technical lead". The Appellant has had no opportunity to review, consider, analyse or respond to the consultation response from the EA's internal "technical lead"[5].

2.12. Issued alongside the Amended EP, the Decision Notice sets out the EA's reasons for refusing the proposed treatment of asbestos contaminated soils as part of the STF.

3. REASONS FOR REFUSAL

3.1. The Decision Notice ("the DN") states:

"We have refused the proposal outlined in the application to accept and treat soils containing asbestos under EWC 17 06 05. As the facility is an installation under the Environmental Permitting (England and Wales) Regulations 2010 we must exercise our functions to achieve a high level of protection for the environment taken as a whole, by in particular preventing or where that is not practicable reducing emissions into air, water and land. We also need to ensure compliance with Article 11 of the Industrial Emissions Directive 2010/75/EU (IED) which requires the use of Best Available Techniques to reduce emissions and the impact on the environment as a whole.*

The operator proposed that only soils containing bound asbestos would be accepted for treatment. They state that bound material is considered in a cement matrix consisting of visible fragments. The operator also proposed the following operating techniques for the waste stream:

- *Segregated storage and processing area for asbestos contaminated soils.*
- *Stockpiles covered with tarpaulins.*

[5] Indeed, the Appellant has not even been informed who this is within the EA.

• Asbestos contaminated soils to be screened using a three-way screener. The screener and conveyers of the screener will be covered and linked to a HEPA filter. Monitoring to be undertaken at the filter.

• Post screening soils to travel along an input conveyer with spray rail to a covered picking station, visible fragments of asbestos to be hand-picked and placed in polythene bags prior to deposit within locked skips.

• Dust suppression to be in place to dampen stockpiles and during loading and unloading activities.

The purpose of soil treatment is to enable reuse of soil for the restoration of the wider landfill site. The picked asbestos pieces would be sent to hazardous landfill for disposal.

Annex II of IED lists asbestos (suspended particulate, fibres) as a polluting substance to air. We consider that the proposed operation poses a risk of generating airborne fibrous asbestos fibres**. Asbestos from fibrous or damaged/broken bonded asbestos can easily become airborne during handling and treatment. The inhalation of asbestos fibres can cause serious illness and significant harm to human health including malignant lung cancer.* Any release of fibres would create a risk to human health as there is no safe lower limit. Therefore, *having regard to the nature of the potential emissions and the need to prevent them to ensure the waste management of asbestos is carried out without endangering human health or without harming the environment, **it is essential that the handling of waste containing asbestos is kept to a minimum to avoid the risk of release of asbestos.

***Where waste soil is treated in fixed plant, Best Available Techniques (BAT) applies as described in the Waste Treatment BATC 2018**. Relevant appropriate measures should be used as identified in Sector Guidance EPR S5.06 "Guidance for the Recovery of Hazardous and Non-Hazardous Waste S5.06 and supplemented by document "Hazardous Waste Soil Treatment".*

*In accordance with the Industrial Emissions Directive, **BAT is to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it**. **We do not consider that the proposed operating techniques for the storage, handling and treatment of asbestos waste represent BAT.** We consider that **the storage, handling and treatment of asbestos wastes in the manner proposed increase the risk of airborne fibres being released into the***

environment. The proposed method of treatment is not considered to be acceptable and the operator has not provided justification that there are benefits from the proposed treatment which would outweigh the risks.

We consider that ***the screening process proposed by the operator is likely to agitate the waste and result in the generation of asbestos fibres****. The operator has provided details of a covered three-way screen linked to HEPA filter in which treatment will be undertaken. This however will* ***eject soils potentially with a higher fibre content than when they were received on site****.*

The soils would then be subject to hand picking for asbestos fragments within a mobile picking station. Spray rails for damping down would be used on the input conveyers for dust suppression.

Annex II of IED lists asbestos (suspended particles, fibres) as a polluting substance to air. ***We consider that the proposed operation poses a risk of generating airborne asbestos fibres. Degraded and damaged waste will be friable and will pose a risk of releasing asbestos fibres. This will be further compounded by handling and treatment.***

We consider the mechanical screening process proposed by the operator is likely to agitate the waste and result in the generation of asbestos fibres*.* ***Such fibres from damaged/broken bonded asbestos can easily become airborne during treatment****.* ***The screening of such waste will break the asbestos pieces and release fibres.*** *The inhalation of asbestos fibres can cause serious illness and significant harm to human health including malignant lung cancer.* ***Any increase and/or agitation of fibres would create a risk to human health as there is no safe lower limit.*** *Therefore, having regard to the nature of the potential emissions and the need to prevent them to ensure the waste management of asbestos is carried out without endangering human health of [sic] without harming the environment,* ***it is essential the handling of waste containing asbestos is kept to a minimum to avoid the risk of any release of asbestos****."* (emphasis added)

4. BACKGROUND AND SUMMARY OF PROPOSED ACTIVITY

4.1. The Site is an existing non-hazardous waste landfill which is undergoing restoration. The landfill operates pursuant to a ROMP[6], which will expire in 2048. The Appellant's

[6] Review of Old Minerals Permission

restoration scheme for the landfill anticipates that restoration of the landfill void will be complete within 10 years (subject to sufficient waste arisings, including hazardous waste to be pre-treated at the Site prior to use in the restoration of the landfill).

4.2. Details of potentially sensitive receptors near to the Site (within 500m) are included within the Amenity and Accidents Risk Assessment[7] and include a nearby travellers site, residential properties off Daneshill Road and recreational sailing club.

4.3. As granted by the EA, the Amended EP permits the STF (excluding asbestos contaminated wastes) to treat up to 29,999 tonnes of hazardous waste for use in the wider landfill restoration at the Site. Accordingly, the EA is satisfied that the Appellant has complied with BAT in respect of all activities for which the Amended EP has been granted, including the appropriate management of deposited (i.e. disamenity) dust and smaller particular emissions (for example PM_{10}, $PM_{2.5}$) from the treatment of hazardous waste for use in the restoration scheme.

4.4. If this appeal is allowed, the STF would also receive asbestos contaminated soils which are classified as hazardous waste (in addition to the hazardous waste streams already authorised by the Amended EP) which can be treated effectively to ultimately recover soil with a non-hazardous waste classification. A maximum of 29,999 tonnes per annum of hazardous waste would be brought into the Site. Additionally, 20,001 tonnes of non-hazardous waste will be imported to the Site annually equating to a total annual importation of 50,000 tonnes. These waste volumes have been assessed based upon the requirements of the local industries from which the waste arisings result, with the objective that the Site can be restored in a proposed 10-year time period.

4.5. In the event that treatment of soils contaminated with bonded asbestos cannot be treated at the STF, for re-use in the restoration of the landfill at the Site, it is highly likely that this waste stream will have to be sent to hazardous waste landfill. The opportunity to efficiently recover and recycle the soil, in accordance with the waste hierarchy, to enable the restoration of the landfill at Site, would be lost. There is a defined need in the local construction industry for a compliant and cost-effective treatment solution for soils contaminated with bonded asbestos.

[7] See Table 1, page 2 of the Amenity and Accidents Risk Assessment, dated January 2021, submitted in support of the Application.

4.6. The importation of asbestos contaminated soils and their remediation via the STF for re-use in restoring the landfill at the Site ("the Proposed Activity"), is a key aspect of securing the 10 year timescale for completion of the landfill. If achieved this would likely bring forward the cessation of landfilling activities by over 10 years compared to the 'end date' of the ROMP and the environmental benefits which would flow from: i) the early cessation of landfilling activities and ii) the creation of the final restoration scheme.

4.7. The Proposed Activity would be undertaken on behalf of the Appellant by Provectus Soil Management Ltd ("Provectus"). Provectus specialise in the remediation of asbestos contaminated soils and (amongst other sites) currently operate a soil treatment facility with a treatment licence deployed for the treatment of asbestos contaminated soils at the Appellant's site at Maw Green. The Maw Green soil treatment operation uses precisely the same methodology as proposed for the STF at the Site.

4.8. Clear acceptance protocols are proposed for the Proposed Activity as set out in the proposed Soil Reception Procedure[8] ("the SRP"). The SRP prescribes measures to ensure that any asbestos contaminated soils accepted for treatment at the STF are limited to bonded asbestos only, such as asbestos cement, and states that in the event any load containing, "any form of asbestos insulation/unbound asbestos types the load will then be immediately rejected".

4.9. Following preliminary acceptance, against the producer's waste description, asbestos contaminated soils will not be formally accepted for treatment at the STF until further analysis has been undertaken and approved in accordance with the Soil Characterisation Procedure[9] ("the SCP"). The SCP provides for sampling to be undertaken to quantify asbestos fibres in soil from each individual job (utilising the unique authorisation code for the same) at a prescribed minimum frequency: one sample for less than 100 tonnes; 2 samples for 100-500 tonnes; 2 samples for over 500 tonnes, plus 1 further sample for every additional 500 tonnes. Chemical testing is then undertaken to confirm maximum concentrations of i) free dispersed chrysotile asbestos fibres at less than 0.1% w/w, and ii) free dispersed amphibole asbestos fibres at less than 0.01% w/w. In addition, visual inspection of soils also confirms that

[8] Ref: STC – W1 002 – Rev 6, dated 1 September 2021
[9] Ref: STC – W1 003 – Rev 7, dated 1 September 2021

asbestos insulation/unbound asbestos is entirely absent from any soils which are accepted for treatment at the STF.

4.10. Any loads which do not prescribe to the specified threshold levels set out in the SCP will be rejected. Whilst testing is awaited, the asbestos contaminated soils are to be stored in a segregated area on the Site and will remain covered to further prevent and minimise any escape of emissions.

4.11. Once the full acceptance protocol has been completed, the soils containing incidental levels of bonded asbestos are subjected to mechanical screening which takes place outdoors (as opposed to within the confines of a building). Monitoring for airborne asbestos fibres at the location of the mechanical screener, to ensure the efficacy of BAT, is proposed.

4.12. Thereafter, the soils are transferred to a covered conveyor picking line to facilitate the final handpicking of any visible bonded asbestos fragments. Once picking has been completed, the recovered soils are inspected and subjected to further testing for asbestos levels prior to being used as part of the wider landfill restoration scheme at the Site.

4.13. Alongside extensive operational controls through the treatment process, a robust monitoring regime is proposed to ensure that fugitive airborne asbestos fibres are not emitted from the treatment of asbestos contaminated soils. The October EMP sets out the proposed monitoring frequency (Table 5)[10]. The details are further encapsulated in the draft 'Outline Asbestos in Air Monitoring Strategy and Methodology'[11] ("the Methodology") and proposed routine monitoring 'at source' (i.e. where the asbestos contaminated soil is being treated) and at specified boundary locations. The proposed Limit of Quantification ("LOQ") for 'routine activity monitoring' is 0.002 fibres/ml and for 'routine boundary monitoring' is 0.0005 fibres/ml (assessed using phase contrast optical microscopy). Where monitoring indicates that the proposed monitoring thresholds are being approached or exceeded, Alert Levels have been set and clear actions are prescribed including a review of operational and environmental parameters and, in the case of an exceedance of 0.002 fibres/ml, the immediate cessation of all asbestos related activities until the cause of the exceedance has been identified and repeat monitoring indicates that operations may resume.

[10] See Table 5, page 26 of the October EMP.
[11] Appendix A of the Remedia Report dated March 2021

4.14. In support of this appeal, the Appellant's expert evidence will provide full and comprehensive details of the Proposed Activity, drawing upon and referring to the details submitted with the Application. This evidence will further elucidate and support the Appellant's case that the Proposed Activity will, if granted on appeal, be fully compliant with the relevant requirements of BAT.

4.15. Furthermore, the Appellant will adduce expert evidence to provide an overview of the need for the remediation of asbestos contaminated soils in the UK, so as to preserve scarce hazardous waste landfill capacity in the UK and ensure the wider objectives of the waste hierarchy are secured. The Appellant's expert evidence will provide a review of current working practices which are frequently deployed in England and Wales, to recover asbestos contaminated soils, to demonstrate that the Proposed Activity is in full accordance with best practice and industry standards.

5. RELEVANT LEGAL PRINCIPLES

5.1. An overview of the relevant legal principles and guidance, so far as is relevant to the Appeal, is set out below.

5.2. The Appellant reserves the right to add or amend to its case by way of legal submissions and refer to any other statutory provisions, case law, and regulatory guidance as may be relevant to the Appeal.

5.3. The Appellant further reserves the right to respond to any matters of law and/or guidance raised by the EA, once the Appellant has had sight of the EA's case.

5.4. It is noted that, in the DN, the EA refers to a document titled, "Hazardous Waste Soil Treatment". This document does not appear to be publicly available. Should the EA continue to rely on this document, the Appellant respectfully requests that a full copy be made available to it.

Legislation

5.5. EU Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) ("the IED"): "lays down rules on integrated prevention and control of pollution arising from industrial emissions"..."It also lays down rules designed to prevent or, where that is not practicable, to reduce emissions into air, water and land and to

prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole."[12]

5.6. The effect of Articles 10 and 11 of the IED is that "installations"[13] which involve the recovery of hazardous waste by physico-chemical treatment and have a capacity exceeding 10 tonnes per day are required to apply "the best available techniques" hereinafter referred to as "BAT".

5.7. In addition to the application of BAT, Article 11 further requires that installations must be operated (so far as is relevant) "in accordance with the following principles":

5.7.1. All appropriate preventative measures are taken against pollution;

5.7.2. No significant pollution is caused;

5.7.3. The generation of waste is prevented in accordance with Directive 2008/98/EC[14];

5.7.4. Where waste is generated it is in order of priority and in accordance with Directive 2008/98/EC[15], prepared for re-use, recycled, recovered or, where that is technically and economically impossible, it is disposed of while avoiding or reducing any impact on the environment;

5.7.5. The necessary measures are taken to prevents accidents and limit their consequences.

5.8. BAT is defined in the IED and means:

[12] Article 1 of the WID.
[13] Defined as a "stationary technical unit".
[14] As amended
[15] As amended

"the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole:

(a) 'techniques' includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;

(b) 'available techniques' means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

(c) 'best' means most effective in achieving a high general level of protection of the environment as a whole;"

5.9. In granting a permit for an installation to which the IED applies, Article 14 requires:

"...that the permit includes all measures necessary for compliance with the requirements of Articles 11 and 18.

Those measures shall include at least the following:

(a) emission limit values for polluting substances listed in Annex II, and for other polluting substances, which are likely to be emitted from the installation concerned in significant quantities, having regard to their nature and their potential to transfer pollution from one medium to another;"

5.10. Annex II of the IED includes asbestos (suspended particles, fibres) within the 'list' of polluting substances.

5.11. Annex III of the IED sets out criteria for use by Members States for determining BAT and specifically includes:

5.11.1. "the furthering of recovering and recycling of substances generated and used in the process and of waste, where appropriate";

5.11.2. "the nature, effects and volume of the emissions concerned";

5.11.3. "the need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it".

5.12. Article 13 of the IED makes provision for harmonised decisions on BAT for certain activities by way of BAT reference documents and for Decisions on BAT conclusions to be issued.

5.13. The BREF for Waste Treatment[16] ("the BREF") does not specifically deal with BAT for the removal of asbestos from contaminated soils for the purpose of recovering those soils for further use. Alongside, the BAT conclusion for waste treatment[17] ("the BAT Conclusion"), the BREF sets out 20 'General BAT Conclusions' including techniques to be adopted for ensuring 'overall environmental performance' and managing 'diffuse emissions to air'.

5.14. In particular, it should be noted that the BREF and the BAT Conclusion prescribe requirements for management and operational procedures as part of BAT, such as waste acceptance protocols, implementation of Environmental Management Systems, waste stream management and accident management plans.

5.15. BAT 14 (of the BREF and the BAT Conclusion) relates specifically to diffuse emissions to air and states that:

"In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of techniques given below. Depending on the risk posed by the waste in terms of diffuse emissions to air, BAT 14d is especially relevant".

5.16. In so far as is relevant, BAT 14 "includes" the following techniques:

[16] Best Available Techniques (BAT) Reference Document for Waste Treatment 2018
[17] Commission Implementing Decision (EU) 2018/1147 dated 10 August 2018

5.16.1. BAT14 (a) – minimising the number of potential diffuse emission sources; "this *includes* techniques such as: limiting the drop height of material; limiting traffic speed; using wind barriers;

5.16.2. BAT 14 (d) – containment, collection and treatment of diffuse emissions; "this *includes* techniques *such as*: storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings *and/or enclosed equipment e.g. conveyor belts"*; collecting and directing the emissions to an appropriate abatement system via an air extraction system;

5.16.3. BAT 14 (e) – "*dampening potential sources of diffuse dust emissions* (e.g. waste storage, traffic areas, *and open handling processes*) with water or fog".[18]

The Environmental Permitting (England and Wales) Regulations 2016 ("the EP Regs")

5.17. The EP Regs implement the IED into English law and have the effect, through the operation of Part 1 of Schedule 1 and Schedule 7 of requiring BAT to be applied for the grant of any environmental permit for an installation undertaking physico-chemical treatment of hazardous waste exceeding 10 tonnes per day (a Part A(1) activity).

5.18. Schedule 7 (5) in particular requires the regulator to exercise its relevant functions so as to ensure compliance with the key provisions of the IED, including Article 11.

The Environment Act 1995

5.19. The Environment Act 1995 ("the EA 1995") established and sets out the duties of the EA; the following provisions are particularly relevant:

"Chapter 1 Section 4.— Principal aim and objectives of the Agency.
(1) It shall be the principal aim of the Agency (subject to and in accordance with the provisions of this Act or any other enactment and taking into account any likely costs) in discharging its functions so to protect or enhance the environment, taken as a whole, as to make the contribution towards attaining the objective of achieving sustainable development mentioned in subsection (3) below;

Chapter 1A Section 5.— General functions with respect to pollution control.

[18] All emphasis added.

(1) [An appropriate agency's] pollution control powers shall be exercisable for the purpose of preventing or minimising, or remedying or mitigating the effects of, pollution of the environment.

(4) [An appropriate agency] shall follow developments in technology and techniques for preventing or minimising, or remedying or mitigating the effects or, pollution of the environment."

The Control of Asbestos Regulations 2012 ("the Asbestos Regulations")[19]

5.20. Regulation 11(1) of the Asbestos Regulations provides that:

"(a) Every employer must prevent the exposure to asbestos of any employee employed by that employer so far as is reasonably practicable; (b) where it is not reasonably practicable to prevent such exposure: (i) take the measures necessary to reduce exposure to asbestos of any such employee to the lowest level reasonably practicable by measures other than the use of respiratory protective equipment..."

5.21. Regulation 16 of the Asbestos Regulations provides that:

"Every employer must prevent or, where this is not reasonably practicable, reduce to the lowest level reasonably practicable the spread of asbestos from any place where work under the employer's control is carried out."

Relevant Guidance

Guidance for Regulated Facilities with and Environmental Permit to Treat or Transfer Chemical Waste ("the Appropriate Measures Guidance")[20]

5.22. Reference will be made to the Appropriate Measures Guidance and the Appellant's expert evidence will demonstrate that the Proposed Activity is compliant with the same.

5.23. The Appellant will make reference to and rely upon the absence of any reference to the Appropriate Measures Guidance by the EA in the determination process of the Application and/or in the DN.

[19] SI 2012/632

[20] Published by the EA on 18 November 2020: Chemical waste: appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)

Sector Guidance EPR S5.06 – Guidance for the recovery and disposal of hazardous and non-hazardous waste ("the Guidance")

5.24. The EA has not issued specific guidance regarding BAT for the treatment of asbestos contaminated soils.

5.25. Reference is made by the EA[21] to the Guidance notwithstanding that it has been superseded by the BREF and BAT Conclusion.

5.26. Section 2 of the Guidance sets out 'Techniques for Pollution Control including 'summarised' indicative BAT requirements. It highlights that:

"*The indicative BAT requirements may not always be absolutely relevant or applicable to an individual installation, when taking into account site-specific factors, but will always provide a benchmark against which individual Applications can be assessed*"[22].

5.27. The Guidance confirms that for all operations, ensuring pre-acceptance controls in accordance with BAT is critical, emphasising that emissions should be prevented through operational controls where at all possible.

5.28. Section 2.2.4 of the Guidance deals specifically with fugitive emissions to air. It notes that 'conveyors' are a common source of fugitive emissions to air, although the list provided is indicative only.

5.29. Asbestos is not specifically referred to within the Guidance, however, the indicative BAT requirements for dust are stated as:

"*Dust - The following general techniques should be employed where appropriate:*
- *Covering of skips and vessels*
- *Avoidance of outdoor or uncovered stockpiles (where possible)*
- *Where dust creation is unavoidable, use of sprays, binders, stockpile management techniques, windbreaks and so on*
- *Regular wheel and road cleaning (avoiding transfer of pollution to water and wind blow)*

[21] See reference to the Guidance by the EA in the DN (set out for ease of reference at paragraph 3.1 of these Grounds, above).
[22] See page 19 of the Guidance

• Closed conveyors, pneumatic or screw conveying (noting the higher energy needs), minimising drops. Filters on the conveyors to clean the transport air prior to release

• Regular housekeeping

• Enclosed silos (for storage of bulk powder materials) vented to fabric filters. The recycling of collected material should be considered under Section 2.6.

• Enclosed containers or sealed bags used for smaller quantities of fine materials."

WHO Air Quality Guidelines for Europe (dated 2000) ("the WHO Guidelines")

5.30. The WHO Guidelines, which are now over 20 years old, provide the following guidance on asbestos levels stating:

"Guidelines Asbestos is a proven human carcinogen (IARC Group 1). No safe level can be proposed for asbestos because a threshold is not known to exist. Exposure should therefore be kept as low as possible.

Several authors and working groups have produced estimates indicating that, with a lifetime exposure to 1000 F/m3 (0.0005 F/ml[23] or 500 F*/m3, optically measured) in a population of whom 30% are smokers, the excess risk due to lung cancer would be in the order of 10^{-6}–10^{-5}. For the same lifetime exposure, the mesothelioma risk for the general population would be in the range 10–5–10–4. These ranges are proposed with a view to providing adequate health protection, but their validity is difficult to judge. An attempt to calculate a "best" estimate for the lung cancer and mesothelioma risk is described above."*[24]

SoBRA Asbestos in Soil Human Health Risk Assessment (AiSHHRA) Toolbox, December 2021 ("the SoBRA Toolbox")

5.31. The SoBRA Toolbox was developed to aid the consistency and robustness of asbestos in soil risk assessments. It sets out a number of potential assessment tools which can be utilised to determine the level of risk exposure caused by a particular activity.

SoBRA Discussion Paper

[23] fibre concentrations based on optical microscopy are marked F*/m³. If concentrations measured by Phase Contrast Optical Microscopy (PCM) are to be compared with environmental fibre concentrations measured by a scanning electron microscope (SEM), a conversion factor has to be used: 2 F/m³ = 1 F*/m³.

[24] See page 133 of the Guidance

5.32. SoBRA also published a Discussion Paper on Guidelines for Airborne Concentrations of Asbestos Fibres in Ambient Air: Implications for Quantitative Risk Assessment, dated January 2021 ("the Discussion Paper"), with the aim of documenting, "the results of research and evaluation undertaken over the past year on air quality thresholds for asbestos in ambient air". The Discussion Paper identifies an absence of clear regulatory policy and technical guidance in the UK with regard to environmental thresholds for airborne asbestos fibres, unlike in some other countries, and it presents evidence for differentiating between chrysotile and amphiboles when considering the risk from exposure to asbestos fibres. It is evident from the Discussion Paper that the risk from chrysotile fibres is likely to be over-estimated by some published thresholds that do not distinguish between asbestos type. Related SoBRA guidance, and the Joint Industry Working Group's Decision Support Tools that were published to support the CL:AIRE Guidance, also point to a lower risk of airborne respirable fibres from bound cement asbestos products compared to more friable products.

5.33. The Discussion Paper concludes that:

"It is recommended that the linear version of the H&D model for pleural mesothelioma is used to estimate risk and calculate air guideline values in conjunction with the non-linear variants for peritoneal mesothelioma and lung cancer. SoBRA has developed an excel-based tool to implement both the non-linear and linear versions of the H&D model. This model is provided free to use via the SoBRA website.

It is evident from the assessment presented in this paper that there is a clear requirement for further research into background air concentrations in the UK. This is needed to be able to benchmark the practicability of proposed air guidelines. It is also evident that a step change in air monitoring practice is required; with a move away from the use of occupational monitoring techniques that typically report to 10000f/m3 (0.01f/ml) and use non-fibre-discriminatory PCM analysis to methods capable of measuring down to at least 10f/m3 using fibre-discriminatory SEM or Transmission Electron Microscopy (TEM) analysis (as advocated by the authors of CIRIA C733)."

<u>Asbestos in Soil – A Pan European Perspective; NICOLE 2021 ("the NICOLE Report")</u>

5.34. The purpose of the NICOLE Report is to provide an overview of best practice in the industry and examine some of existing clear standards and detailed guidance that exist in European countries regarding risks arising from asbestos in soil.

5.35. Case studies are provided within the NICOLE Report, in particular, it is noted that one such case study dealt with the demolition of remediation of a 44 acre foundry/iron works site in Ipswich[25]. Asbestos contaminated soil was fed into a three-way screener. The oversize material was proven to be suitable for reuse on site. The mid-size fraction was further processed via a handpicking station. Throughout the works, air was monitored to demonstrate control measures were suitable, allowing 65,000 tonnes of asbestos contaminated soil to be reclaimed, as opposed to disposed of in a hazardous landfill.

Control of Asbestos Regulations 2012 - Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance ("the CL:AIRE Guidance")[26]

5.36. The CL:AIRE Guidance was prepared by the Joint Industry Working Group ("JIWG") on Asbestos in Soil and Construction & Demolition (C&D) Materials, supported by the Health and Safety Executive ("HSE"). The CL:AIRE Guidance is aimed at securing improvements within the brownfield and contaminated land industry.

5.37. The CL:AIRE Guidance, "contains industry-produced practitioners guidance"[27] to help employers comply with the Asbestos Regulations when undertaking work on soil and C&D materials that may be or are contaminated with asbestos. The CL:AIRE Guidance states that, "The primary aim of this guidance is to provide clarity about working with asbestos-contaminated soil and C&D materials. It outlines the steps that should be taken by clients, employers and others in the geoenvironmental management and construction sectors that have a duty to ensure that workers and others are not exposed to asbestos as a result of work in, on or with such materials".

5.38. The CL:AIRE Guidance is supported by JIWG decision tools[28], to which reference will be made by the Appellant in support of its case as required.

6. GROUNDS OF APPEAL

6.1. The Appellant's Grounds of Appeal are:

6.1.1. Ground One - the Proposed Activity complies with the requirements of BAT;

[25] See pages 39-41 of the NICOLE Report.
[26] CL:AIRE, 2016.
[27] See paragraph 2 of the CL:AIRE Guidance
[28] Asbestos in Soil (claire.co.uk)

6.1.2. Ground Two - the EA has misdirected itself in its interpretation and application of BAT, in particular BAT14 and BAT 14d;

6.1.3. Ground Three - Article 11 of the IED is complied with.

Ground One – the Proposed Activity complies with the requirements of BAT

6.2. The Appellant will demonstrate that the Proposed Activity is fully compliant with BAT.

6.3. As set out in detail at the application stage, the Proposed Activity will be operated in accordance with stringent management and operational procedures to ensure that emissions are minimised, where possible, using appropriate techniques.

6.4. The Proposed Activity will be undertaken in accordance with industry best practice. Provectus is an industry leader in the field of the treatment and remediation of asbestos contaminated soils and operate facilities to strict internal controls so as to avoid, where at all possible, any asbestos related emissions.

6.5. The EA has not particularised why it considers that "the proposed operating techniques for the storage, handling and treatment of asbestos waste" do not represent BAT. The Appellant reserves the right to respond in full to any further particularisation of the EA's case in this respect.

6.6. The EA has failed to provide any evidence (technical or otherwise) to support its assertions in the Decision Notice that the Proposed Activity will result in increased amounts of asbestos fibres being released, as a result of the treatment process, or indeed to support any of the assertions made by the EA in the DN. The Appellant will demonstrate, via the analysis of robust monitoring data, that the EA's assertion is incorrect.

6.7. The Appellant will adduce expert evidence in support of its Appeal to fully assess all potential emission sources which arise from the Proposed Activity and demonstrate that BAT will be complied with throughout the 'life cycle' of the operation.

6.8. The EA has not published any guidance which addresses the requirements of BAT specifically in the context of the remediation of asbestos contaminated soils. The DN does not disclose any technical basis on which the EA relies to assert that BAT is not complied with and it has been unable, throughout the determination of the Application,

to identify what additional techniques would be appropriate for the Proposed Activity. The EA provides no justification whatsoever for its refusal in the DN, but simply makes a number of bold assertions which are unsupported by any evidence, technical or otherwise. The Appellant's expert evidence will address each of the EA's assertions in the DN in turn and demonstrate that the Proposed Activity complies with BAT.

6.9. The Appellant will contend that the EA has failed to have proper regard to the need to prevent or reduce to a minimum the *overall impact* of any emissions on the environment and the risks to it.

6.10. The Appellant will further rely upon the EA's acceptance that the Appellant has demonstrated BAT is complied with in respect of any dust emissions arising from the activities which have been included within the Amended EP[29].

6.11. The Appellant reserves the right to respond to any new technical evidence which the EA seeks to submit through the Appeal process.

Ground Two – EA has mis-interpreted (a) BAT14 and (b) BAT14(d)

(a) BAT14

6.12. The EA has adopted an erroneous interpretation of BAT14 which places undue reliance on selective parts of BAT14d.

6.13. Although not expressly stated in the DN, when considered as a whole, the EA's position appears to be that any proposal which falls short of all asbestos related activities being 'fully enclosed', with all asbestos emissions being 'collected and directed to an abatement system', is not compliant with BAT14.

6.14. It should be noted that the EA has not adopted any guidance nor adduced any evidence which would support any such assertion. Neither has the EA carried out any assessment which considers the practicability of any such policy approach being imposed on industry, having regard to the wider objectives of the IED and the need to ensure waste is managed in accordance with the waste hierarchy.

[29] As referred to at paragraph 4.3 of these Grounds.

6.15. The Appellant will contend that, in order to comply with BAT, it is not necessary for the Proposed Activity to be 'fully enclosed' (in the manner which the EA appears to allege) and that such an interpretation would fail to ensure waste is managed in accordance with the waste hierarchy.

6.16. As a starting point, the Appellant will contend that it is important to carefully consider the wording of BAT14. It states: "In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust...BAT is to use an appropriate combination of the techniques given below".

6.17. 8 separate techniques (a. to h.) are then set out within the BAT Conclusion as forming part of BAT14.

6.18. As a matter of literal interpretation, it is self-evident that BAT14 does not require all of the techniques referred to in a. to h. to be deployed in order to establish compliance with BAT14. The key question to be determined is whether the proposal will use "an appropriate combination" of the techniques available.

6.19. Determining whether a particular combination is "appropriate" must be carried out in the context of the overall objective which BAT14 is seeking to achieve, namely the prevention or "where that is not practicable" the *reduction* of diffuse emissions to air.

6.20. The Appellant's expert evidence will demonstrate that the Proposed Activity proposes to use a range of appropriate techniques which are specifically referenced within BAT14 including, for example[30]:

6.20.1. BAT14a – the Application proposes limiting the drop height of asbestos contaminated soils at all stages from initial acceptance onwards (as set out in the BAT14 Document);

6.20.2. BAT14d – the Application proposes a number of containment measures will in fact be used including the storage of waste in partially enclosed bays, sheeting of waste awaiting treatment, the partial containment of the screener with abatement via HEPA filter, the containment of conveyor belts (in accordance with the manufacturers safety guidance for the

[30] N.B. BAT14 b, c and h are not relevant to the Appeal.

equipment) with abatement via HEPA filter, and the containment of the picking station with abatement via HEPA filter;

6.20.3. BAT14e – the Application proposes that the waste will be dampened throughout all stages of the waste being handled at the Site.

6.21. The Appellant's evidence will demonstrate that a combination of techniques specified in BAT14 are in fact proposed for use, that they are 'appropriate' and that no other 'available techniques' are reasonably available. The Appellant's evidence will assess the requirements of BAT14 and demonstrate that the Proposed Activity is compliant with the same.

6.22. The Appellant will content that the EA has failed entirely to explain (and support any such explanation with objective technical evidence) why it considers that the combination of measures proposed by the Appellant is not 'appropriate', within the meaning of BAT14.

6.23. The Appellant will demonstrate that it has investigated the availability of equipment specifically designed for the treatment of asbestos contaminated soils. The Appellant will demonstrate that the EA has approved for use, in comparable circumstances, identical equipment as that which will be used by the Proposed Activity; reference will be made to case studies (including but not limited to those within the NICOLE Report) in support of the Appeal.

6.24. The Appellant will contend that the EA's refusal to include the Proposed Activity within the Amended EP is seriously undermined by the absence of any specification as to why it considers the combination of techniques falling within BAT14 are not 'appropriate' having regarding the relevant facts.

(b) BAT14d

6.25. BAT14 states that, "***Depending on the risk posed by the waste*** *in terms of diffuse emissions to air, BAT14d is especially relevant*" (emphasis added). The level of risk which triggers the 'especial relevance' of BAT14d is not prescribed in BAT14. The Appellant will contend that the EA has failed to properly understand and apply this aspect of BAT14 and BAT14d, in the context of the risks posed by the waste which will be recovered by the Proposed Activity.

6.26. BAT14d relates to the 'containment, collection and treatment of diffuse emissions' and "includes techniques such as: - storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts); - maintaining the enclosed equipment or buildings under adequate pressure; -collecting and directing the emissions to an appropriate abatement system...".

6.27. Even where BAT14d is 'especially relevant', it does not require that all of the techniques described *must* be utilised in every case. The language suggests that the techniques which are listed as forming part of BAT14d are 'indicative' in nature, it is not a closed list and the application of any, or indeed all, of the techniques is not prescribed in every case.

6.28. BAT14 directs both operators and regulators to carefully consider the relevance of BAT14d, in certain circumstances and does not prescribe the of BAT14d in every case. To take such an approach would be to divorce the application BAT from a proper understanding of the facts relating to a specific proposal, in direct contradiction to its meaning and purpose.

6.29. The 'especial relevance' of BAT14d is directly linked to the risk posed by the waste which is being assessed. This is an issue which must therefore be determined on the facts and applied on a 'case by case' basis, with particular regard to the characteristics of the specific waste stream which is being assessed.

6.30. The wording of BAT14d explicitly provides not only for containment of activities within buildings, but also for particular aspects of activities to be enclosed, with the specific example of conveyors being provided. Accordingly the BAT Conclusion plainly envisages 'partial' enclosure of certain parts of equipment and processes as being in compliant with BAT14d. This is further reflected in the Guidance, which specifically references enclosure of conveyors as forming part of BAT in respect of dust emissions.

6.31. It is therefore erroneous to interpret BAT14d as requiring enclosure of activities within a building in every case. Such a conclusion is not supported by the wording of BAT14d itself.

6.32. As mentioned above, there is an inextricable link between the relevance of BAT14d, and the need of any specific proposals to comply with its terms, and the level of risk

to the environment and/or human health posed by the particular waste stream under consideration. The greater the risk, the higher the level of containment will likely be required to comply with BAT14d.

6.33. The DN does not provide any evidence which indicates that the EA has assessed or determined the degree of risk posed by the waste stream which the Application specifically proposes to store and handle. A zero-tolerance approach to the processing of asbestos related wastes is specifically cautioned against in the NICOLE Report and is not justified by reference to either BAT14d or Article 11 of the IED.

6.34. Having regard to paragraphs 6.25 to 6.33 of these Grounds, the Appellant will contend that the EA has incorrectly interpreted and applied BAT14d. Construed properly, the Appellant will demonstrate that the Proposed Activity is compliant with BAT14d and this will be dealt with in full by the Appellant's expert evidence on BAT (which will be submitted as part of this appeal). Furthermore, the Appellant will contend that in reaching its decision, the EA failed entirely to undertake any, or any proper, assessment of the risk posed by the relevant waste stream in this case. This is a fundamental pre-requisite of BAT14. The Appellant will contend that the EA's failure in this regard has led to the unjustified decision to refuse permission for the Proposed Activity.

Ground 3 – the Proposed Activity complies with Article 11 of the IED

6.35. As set out above, the Appellant will demonstrate that the Proposed Activity fully complies with BAT and that the EA's refusal in this case is predicated on an erroneous and unjustified interpretation of BAT.

6.36. The Appellant will adduce expert evidence to demonstrate that Article 11 of the IED is fully complied with by the Proposed Activity as:

6.36.1. All appropriate preventative measures are taken against pollution;

6.36.2. No significant pollution will be caused;

6.36.3. In accordance with Directive 2008/98/EC[31], the asbestos contaminated soils will be recovered for re-use;

6.36.4. Necessary measures are taken to prevents accidents and limit their consequences.

[31] As amended

6.37. The Appellant will adduce technical data to demonstrate, by way of expert evidence, that the Proposed Activity will not result in significant pollution.

6.38. The Appellant's expert evidence will address and explain the definition of hazardous waste in the context of asbestos contaminated soils and will provide quantitative data to demonstrate the magnitude and/or quantum of bonded asbestos which is expected to be processed by Provectus at the STF, based on the operation of existing facilities.

6.39. The Appellant will emphasise the EA's failure to have regard to the results of monitoring (undertaken at other sites operated by Provectus) during the application process and that this failure to engage with technical information underpins (at least in part) the erroneous conclusion of the EA that the Proposed Activity will result in significant pollution. The Appellant will rely upon monitoring data obtained at other sites operated by Provectus in support of its case.

6.40. The Appellant's expert evidence in support of the Appeal will provide a full review of the location of all relevant sensitive receptors and their location to the STF and to the Site. The Appellant's expert evidence will demonstrate that the Proposed Activity results in a negligible risk, assessed over its full life cycle, to the environment and human health, as a result of the effective deployment of BAT and compliance with the requirements of the Asbestos Regulations. Rigorous and extensive monitoring data will be adduced in support of the Appellant's case to demonstrate that the Proposed Activity will not result in significant pollution.

6.41. The Appellant will contend that the dispersion of emissions would further lower the potential risks of exposure (which are negligible in any event) even in the highly unlikely event of a release of asbestos fibres from the Proposed Activity.

6.42. The Appellant will contend that the EA has failed to have proper regard to the controls which are in force pursuant to the Asbestos Regulations and the consultation response from the HSE. The Asbestos Regulations (which are not a substitute for BAT) are a further legislative control which ensures that the Proposed Activity cannot be undertaken if it would result in significant pollution. The Asbestos Regulations would be fully complied with by the Proposed Activity, as confirmed by the consultation response from the HSE.

6.43. The Appellant will demonstrate that the EA's decision to refuse to grant an Environmental Permit for the Proposed Activity is fundamentally in conflict with its

decisions on other sites and is entirely unjustified. It is simply wrong for the EA to contend that it is lawful and appropriate for exactly the same activities to be undertaken at sites where a mobile treatment licence has been issued, whilst alleging they would result in significant pollution risks when proposed at a stationary installation. The apparent distinction relied upon by the EA (in so far as it is possible to currently understand their case) that BAT does not apply to a mobile installation flies in the face of the EA's statutory obligations pursuant to the Environment Act 1996.

6.44. In accordance with the proposed operational controls, the provisions of the October EMP and the Methodology[32] the Appellant will demonstrate by way of expert evidence, that all necessary measures will be taken to prevent accidents and limit their consequences.

6.45. The Appellant will demonstrate that there is strong policy and regulatory support for the Proposed Activity, which will result in the recovery and appropriate re-use of the soil and reduction of hazardous waste volumes to landfill. The Appellant will adduce expert evidence to demonstrate the pressing need for treatment of soils contaminated with asbestos, arising from the Construction and Demolition sector. Disposing of the asbestos contaminated soils in hazardous landfill will result in wider environmental disbenefits overall and is contrary to the furtherance of the waste hierarchy.

7. CONCLUSION

7.1. As already granted by the EA, the Amended EP permits the STF (excluding asbestos contaminated wastes) to treat up to 29,999 tonnes of hazardous waste for use in the wider landfill restoration. Accordingly, the EA is satisfied that the Appellant has complied with BAT in respect of all activities for which the Amended EP has been granted, including the appropriate management of deposited (i.e. disamenity) dust and smaller particular emissions (for example PM_{10}, $PM_{2.5}$) from the treatment of hazardous waste for use in the restoration scheme.

7.2. The Appellant will demonstrate that granting permission for the Proposed Activity would be in full accordance with the principles of BAT and the objectives of the IED, including the furtherance of the waste hierarchy. The Appellant will contend that the Proposed Activity will prevent or reduce to a minimum the overall impact of any

[32] See reference in paragraph 4.13 of these Grounds.

emissions on the environment and the risks to it and will adduce expert evidence to demonstrate it will not result in significant pollution.

7.3. The Appellant will therefore respectfully request that its appeal be upheld and that the Amended EP is varied so as to include the Proposed Activity within its scope as applied for in accordance with the documents submitted in support of the Application (in so far as they apply to the Proposed Activity) including:

7.3.1. The October EMP; and

7.3.2. The following drawings:

7.3.2.1. 3982-CAU-XX-XX-DR-V-1803_S2_P07;

7.3.2.2. 3982-CAU-XX-XX-DR-V-1807_S2_P02;

7.3.2.3. 3982-CAU-XX-XX-DR-V-1810_S2_P01;

7.3.2.4. 3982-CAU-XX-XX-DR-V-1811_S2_P01;

7.3.2.5. 3982-CAU-XX-XX-DR-V-1812_S2_P01;

7.3.2.6. 3982-CAU-XX-XX-DR-V-1800-P02.

7.4. The Appellant reserves the right to call additional expert evidence (in addition to that particularised in these Grounds) in support of its appeal by way of rebuttal to the EA's case, once the EA has particularised the same.

FREETHS LLP

1 June 2023

Request for an Inquiry

Environmental Permit Appeal

Pursuant to Regulation 31 of the Environmental Permitting (England and Wales) Regulations 2016

Regarding Daneshill Soil Treatment Facility at Daneshill Landfill Site
Environmental Permit Variation Reference: EPR/NP3538MF/V009

On behalf of FCC Recycling (UK) Limited ("the Appellant")

Appellant's Request for Environmental Permit Appeal to be determined by way of Public Inquiry.

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1. We refer to the above appeal submitted to the Planning Inspectorate ("PINS") on 1 June 2023. This submission should be read alongside the Appellant's Grounds of Appeal ("the Grounds"), which provide full details of the Appellant's case in support of its appeal.

2. The Appellant respectfully requests that its appeal be dealt with by way of Public Inquiry, given: i) the complexity of the appeal; ii) the technical nature of the evidence which will be adduced; iii) the anticipated level of public interest; iv) the need for evidence to be tested though formal questioning by an advocate; and v) the need to address complex issues of law through legal submission. Each of these points are addressed in further detail below.

3. The procedural guidance which relates to Environmental Permit appeals[1] does not provide specific advice regarding the appropriate criteria for PINs to apply when determining the appropriate mode of appeal.

4. Accordingly, we refer below to the guidance used by PINs to determine the mode of appeal for planning appeals[2] ("the Guidance"), the substance of which is equally applicable to Environmental Permit appeals (albeit many planning appeals will be of a less technical nature that those which concern environmental permits).

[1] Environmental permit - Guidance on the Appeal procedure - GOV.UK (www.gov.uk)

[2] Criteria for determining the procedure for planning, enforcement, advertisement and discontinuance notice appeals, published 21 April 2022 accessed at: Criteria for determining the procedure for planning, enforcement, advertisement and discontinuance notice appeals - GOV.UK (www.gov.uk)

5. Having regard to the relevant criteria we set out below a detailed justification for the appeal to be allocated to the Public Inquiry mode:

5.1. **Need for evidence to be tested by an advocate** – the Appellant will adduce technical evidence in support of its case. This evidence will include technical expert evidence relating (but not limited) to: Best Available Techniques ("BAT"), asbestos monitoring, existing facilities and environmental permits which are relevant to the appeal, best practice regarding the management of soil contaminated with asbestos and the quantification of the impact of emissions (if any) on the environment and/or any risks which may arise to human health. These matters will be addressed by relevant expert witnesses who specialise in their respective fields. Large amounts of highly technical data will therefore be provided in evidence in support of the appeal.

5.2. It is anticipated that the Environment Agency will adduce its own technical evidence in defence of the appeal, addressing the same issues as those raised by the Appellant.

5.3. All technical evidence, submitted by any party who participates in the appeal, will need to be tested through formal questioning by an advocate due to its complex nature and highly technical content.

5.4. The Appellant considers that it is imperative to the fair and effective determination of the case that it is permitted to robustly test the technical evidence of any other party (submitted for consideration in the appeal) by way of formal cross-examination.

5.5. It is also highly likely that the main parties (as a minimum) will require an opportunity for rebuttal evidence, once main proofs of evidence have been exchanged, which again will be highly technical in its nature. The formality of the Public Inquiry process will ensure that these issues can be dealt with in an efficient and procedurally fair manner.

5.6. The Appellant expects to call a minimum of three expert witnesses in support of its case and reserves the right to call additional witnesses (should this be necessary to address the Environment Agency's case). It is anticipated that the Environment Agency will call a similar number of expert witnesses. Accordingly, the estimated length of hearing will likely be in the order of 3-5 days (excluding site visit) which

further indicates that this appeal should be allocated to the Public Inquiry mode of appeal.

5.7. **Complexity** – As is most often the case when dealing with environmental permit appeals, the entirety of the technical evidence in support of the Appeal will be complex.

5.8. Experts in the field of best practice regarding the treatment of asbestos contaminated soils will be called to provide evidence in support of the Appeal and the Inspector will be therefore be assisted by the formal presentation of evidence and the ability of advocates to test the same through formal cross examination.

5.9. The meaning and application of BAT in this case is particularly complex, as there is no bespoke guidance regarding BAT for the proposed activity, which is the subject of the appeal. Accordingly, the Inspector will be assisted by the formal presentation of evidence on behalf of both the parties, prior to reaching a determination as to whether BAT will be complied with by the appeal proposals.

5.10. The interpretation and application of the Industrial Emissions Directive ("the IED"), the BAT Conclusion and the BREF for Waste Treatment is also in dispute between the main parties. As the Grounds demonstrate, there will also be a need to consider and address a wide range of technical guidance and industry best practice.

5.11. It will be necessary for the Inspector to consider highly technical information regarding any emissions which will arise from the proposed activities. This evidence will include large amounts of high technical monitoring data and analysis, which the Inspector will need to consider in order to determine the Appellant's submission that the proposed activities will not result in 'significant pollution' (as prescribed in Article 11 of the IED).

5.12. The Inspector will also have to consider the interface between the IED and the Waste Framework Directive[3] ("the WFD") and address technical evidence regarding the waste arisings (so far as is relevant to the waste stream being considered in the appeal) and alternative disposal routes.

[3] Directive 2008/98/EC (as amended)

5.13. Resolving the main issues in dispute will require the Inspector to make determinations as to whether the Appellant's or the Environment Agency's technical expert evidence is preferred. In these circumstances, the formal Public Inquiry process will allow the evidence to be fully explained and examined and subjected to robust testing by an advocate, with fairness to all parties being ensured.

5.14. **Local interest** – The Appellant notes that the Environment Agency undertook public consultation in respect of its decision in this case and that a number of representations were received from third parties, some of which contain information of a technical nature. It is anticipated therefore that there will be continued local interest in the appeal determination process, with several third parties potentially wishing to take an active role as a formal Rule 6 Party.

5.15. **Legal submissions** – The Appellant notes that the Guidance indicates that the prospect of legal submissions alone is not a reason why an appeal would need to be heard by Public Inquiry. However, the Guidance accepts that this is a relevant and material consideration and, the Appellant submits, it is particularly apposite to this appeal. As the Grounds set out in detail, the determination of this appeal will depend upon the correct legal interpretation of the IED, the BAT Conclusion and the BREF for Waste Treatment, in addition to addressing the interplay between the IED and the WFD. These are particularly technical and complex legal issues and clearly warrant submissions being made orally. Accordingly, the Appellant respectfully submits that determination by way of Public Inquiry is the most appropriate mode of appeal for this case.

6. Given the technical and complex nature of the appeal, it is imperative that the Appellant is provided with notice of any intention of any party to obtain Rule 6 status and is provided with any evidence (being adduced and relied upon by third parties) in accordance with the formal timescales for Public Inquiries. Further the Appellant considers, as a matter of fairness, that it is afforded an opportunity (should it be necessary) to test any evidence called by third parties through the cross-examination process.

7. Proceeding with the Public Inquiry mode of appeal will assist the expeditious and fair management of the case for all parties.

8. In summary, there is demonstrable need to have evidence tested formally by an advocate, on matters that are technically complex and which will require legal submissions to be made orally, on technically complex areas of law. Furthermore, there is expected to be sufficient local interest to warrant a Public Inquiry in this case.

9. The Appellant therefore respectfully requests that the appeal be determined by way of Public Inquiry.

Freeths LLP

1 June 2023

Environmental Permit

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

FCC Recycling (UK) Limited

Daneshill Landfill
Daneshill Road
Lound
Nottinghamshire
DN22 8RB

Variation application number

EPR/NP3538MF/V009

Permit number

EPR/NP3538MF

Daneshill Landfill
Permit number EPR/NP3538MF

Introductory note

This introductory note does not form a part of the notice

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied and are subject to the right of appeal.

The variation adds a Soil Treatment Facility (STF) located within the existing permitted landfill boundary. The STF will accept and treat up to 29,999 tonnes per annum of hazardous waste and 20,001 tonnes of non-hazardous waste by bioremediation. Once treated the wastes will be tested for suitability for use in the wider landfill restoration. Soils that don't meet the reuse criteria will be disposed of in the landfill.

The schedules specify the changes made to the permit.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application received EPR/NP3538MF/A001 (Ref NP3538MF)	Duly made 15/05/2007	Application for non-hazardous landfill.
Permit determined EPR/NP3538MF	13/11/2009	Original permit issued to Waste Recycling Limited.
Application EPR/NP3538MF/V002 (Ref. AP3130CC)	Duly made 22/12/2011	Application to add leachate treatment.
Variation determined EPR/NP3538MF	20/03/2012	Varied permit issued.
Notified of change of company name	23/08/2012	Name changed to FCC Recycling (UK) Limited and update of the wording of the financial provision condition.
Variation issued EPR/NP3538MF/V003	12/09/2012	Varied permit issued to FCC Recycling (UK) Limited.
Agency variation determined EPR/NP3538MF/V004	14/05/2013	Agency variation to implement the changes introduced by IED.
Administrative variation determined EPR/NP3538MF/V005	08/10/2013	
Environment Agency Landfill Sector Review Permit reviewed Variation determined EPR/NP3538MF/V006 Permit EPR/NP3538MF	10/01/2017	Varied and consolidated permit issued in modern condition format.

Status log of the permit		
Description	**Date**	**Comments**
Application EPR/NP3538MF/V007 (variation and consolidation)	Duly made 03/04/2017	Application to vary the permit by changing the operational conditions and monitoring requirements relating to the operation of the Short Rotation Coppice.
Additional information received	13/07/2018	Response to Schedule 5 Notice.
Additional information received	18/09/2019	Assessment of interaction between surface water discharge and groundwater.
Variation determined EPR/NP3538MF	31/10/2019	Varied and consolidated permit issued.
Application EPR/NP3538MF/V009 (variation and consolidation)	Duly made 19/02/2020	Application to vary the permit to reduce the number of leachate monitoring locations and amend groundwater compliance monitoring requirements.
Additional information received	18/09/2020	Response to Schedule 5 Notice.
Additional information received	27/11/2020	Further justifications and revised chromium compliance limit received.
Additional information received	16/12/2020	Updated leachate Management Plan received.
Variation determined EPR/NP3538MF (Billing ref: SP3908BH)	10/02/2021	Varied and consolidated permit issued in modern condition format
Application EPR/NP3538MF/V009 (variation and consolidation)	Duly made 16/07/2021	Application to vary to add a soil treatment facility and update the permit to modern conditions.
Additional information received	01/10/2021	Response to Schedule 5 Notice.
Additional information received	04/10/2021	Further response to Schedule 5 Notice.
Additional information received	05/11/2021	Further clarification on information contained within the Schedule 5.
Additional information received	17/11/2021	Further clarification on the information contained within the Schedule 5.
Additional information received	23/11/2021	Details of other sites using CLO as a filter medium.
Additional information received	07/01/2022	Confirmation bio-remediation treatment is for recovery only.
Additional information received	20/01/2022	Waste code clarification
Additional information received	22/02/2022	Asbestos soil screening and storage information
Variation determined and consolidation issued EPR/NP3538MF (Billing ref: BP3604SD)	02/12/2022	Varied and consolidated permit issued in modern format

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies

Permit number

EPR/NP3538MF

Issued to

FCC Recycling (UK) Limited ("the operator")

whose registered office is

3 Sidings Court
White Rose Way
Doncaster
England
DN4 5NU

company registration number 02674166

to operate a regulated facility at

Daneshill Landfill
Daneshill Road
Lound
Nottinghamshire
DN22 8RB

to the extent set out in the schedules.

The notice shall take effect from 09/12/2022.

Name	Date
M Bischer	09/12/2022

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit as a result of the application made by the operator.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/NP3538MF

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/NP3538MF/V009 authorising,

FCC Recycling (UK) Limited ("the operator"),

whose registered office is

3 Sidings Court
White Rose Way
Doncaster
England
DN4 5NU

company registration number 02674166

to operate an installation at

Daneshill Landfill
Daneshill Road
Lound
Nottinghamshire
DN22 8RB

to the extent authorised by and subject to the conditions of this permit.

Name	Date
M Bischer	**09/12/2022**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall 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; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

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

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

1.2 Finance

1.2.1 The financial provision for meeting the obligations under this permit shall be as set out in the Deed of Performance dated 17 October 2007 between the Waste Recycling Group Limited (now known as FCC Environment (UK) Limited) and the Environment Agency as varied by a Deed of Variation dated 15 October 2010 (as varied by further Deeds of Variation from time to time). The operator shall accordingly ensure that the Permit is and remains throughout its subsistence a Permit to which the Deed relates and the operator shall produce evidence of such provision whenever required by the Environment Agency.

1.2.1 The operator shall ensure that the charges it makes for the disposal of waste in the landfill cover all of the following:

(a) the costs of setting up and operating the landfill;

(b) the costs of the financial provision required by condition 1.2.1; and

(c) the estimated costs for the closure and aftercare of the landfill.

1.3 Energy efficiency

1.3.1 The operator shall:

(a) take appropriate measures to ensure that energy is used efficiently in the activities;

(b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.4 Efficient use of raw materials

1.4.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.5 Avoidance, recovery and disposal of wastes produced by the activities

1.5.1 The operator shall:

(a) take appropriate measures to ensure that waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;

(b) review and record at least every four years whether changes to those measures should be made; and

(c) take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in blue on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.3 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless it is authorised by schedule 1 table S1.1 and appropriate measures are taken.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

2.5.1 The operations specified in schedule 1 table S1.4 shall not commence until the measures specified in that table have been completed.

2.6 Landfill Engineering

2.6.1 No construction of any new cell of the landfill shall commence until the operator has submitted construction proposals and the Environment Agency has confirmed that it is satisfied with the construction proposals.

2.6.2 Where the operator proposes to construct any new cell other than the first cell, but proposes no change from the design of the most recently approved cell which could have any impact on the performance of any element of the design, no construction of the new cell shall commence until the operator has submitted a cell layout drawing and the Environment Agency has confirmed that it is satisfied with the cell layout drawing.

2.6.3 The construction of a new cell shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Environment Agency.

2.6.4 No disposal of waste shall take place in a new cell until the operator has submitted a CQA Validation Report and the Environment Agency has confirmed that it is satisfied with the CQA Validation Report.

2.6.5 No construction of landfill infrastructure shall commence until the operator has submitted relevant construction proposals or a written request to use previous construction proposals and the Environment Agency has confirmed that it is satisfied with the construction proposals.

2.6.6 The construction of the landfill infrastructure shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Environment Agency.

2.6.7 The operator shall submit a CQA Validation Report within four weeks of the completion of the construction of the relevant landfill infrastructure, or other time period agreed in writing with the Environment Agency.

2.6.8 Where pollution controls are immediately necessary to prevent an incident or accident, then conditions 2.6.5 and 2.6.6 do not apply and the relevant landfill infrastructure may be constructed, provided that the construction proposals are submitted to the Environment Agency as soon as practicable.

2.6.9 For the purposes of conditions 2.6.1, 2.6.2, 2.6.4 and 2.6.5, the Environment Agency shall be deemed to be satisfied where it has not, within the period of four weeks from the date of receipt of the relevant construction proposals or CQA Validation Report, either:

(a) confirmed whether or not it is satisfied; or

(b) informed the operator that it requires further information.

2.6.10 Where the Environment Agency has required further information under condition 2.6.9(b), the Environment Agency shall be deemed to be satisfied where it has not, within the period of four weeks from the date of receipt of the further information, either:

(a) confirmed whether or not it is satisfied; or

(b) informed the operator that it requires further information.

2.7 Waste acceptance

2.7.1 For the following activities referenced in schedule 1, table S1.1 (AR1 and AR2) wastes shall only be accepted for disposal if:

(a) they are listed in schedule 2, tables S2.1 and S2.2

(b) they are non- hazardous waste and

(c) they are not whole used tyres (other than bicycle tyres and tyres with an outside diameter of more than 1400mm); and

(d) they are not shredded used tyres; and

(e) they are not liquid waste (including waste waters but excluding sludge and excluding liquid waste accepted at a permitted leachate treatment activity); and

(f) they are not chemical substances from research and development or teaching activities, for example laboratory residues, which are unidentified and/or which are new and whose effects on man and/or the environment are unknown; and

(g) all the relevant waste acceptance procedures have been completed; and

(h) they fulfil the relevant waste acceptance criteria; and

(i) they have not been diluted or mixed solely to meet the relevant waste acceptance criteria; and

(j) they are wastes which have been treated, except for: inert wastes for which treatment is not technically feasible; or it is waste other than inert waste and treatment would not reduce its quantity or the hazards which it poses to human health or the environment, or liquid waste accepted for treatment at a permitted leachate treatment activity; and

(k) they are wastes with a code beginning with 07 05 and 16 03, they shall exclude waste medicinal products and pharmaceutically active waste materials arising from their manufacture.

2.7.2 Waste shall only be accepted for treatment if:

(a) it is of a type and quantity listed in schedule 2, table S2.2, S2.4, S2.5, S2.6 and S2.7.

(b) it conforms to the description in the documentation supplied by the producer and holder.

2.7.3 Wastes shall only be accepted for restoration where:

(a) they are listed in schedule 2, table S2.3; and

(b) they are accepted in accordance with a restoration plan approved in writing by the Environment Agency.

2.7.4 For the following activities referenced in schedule 1, table S1.1 (AR1) the operator shall:

(a) visually inspect without unloading it, waste that is not in an enclosed container or enclosed vehicle on arrival at the landfill and waste at the point of deposit; and

(b) be satisfied that the waste conforms to the requirements of condition 2.7.1.

2.7.5 Where the operator has taken samples to establish that the waste is in conformity with the documentation submitted by the holder then the samples taken shall be retained for at least one month and results of any analysis for at least two years.

2.7.6 The operator on accepting each delivery of waste shall provide a receipt to the person delivering it.

2.7.7 The total quantity of waste that shall be deposited in the landfill shall be limited by the pre-settlement levels shown on drawing 348P043.

2.7.8 The quantity of waste that is deposited or recovered in the landfill in any year shall not exceed the limits in schedule 1, table S1.5.

2.7.9 The operator shall maintain and implement a system which ensures that a record is made of the quantity, characteristics, date of delivery and, where practicable, origin of any waste that is received for disposal or recovery and of the identity of the producer, or in the case of municipal waste and multiple collection vehicles, of the collector of such waste. Any information regarded by the operator as commercially confidential shall be clearly identified in the record.

2.8 Leachate levels

2.8.1 limits for the level of leachate listed in schedule 3, table S3.1 shall not be exceeded.

2.9 Closure and aftercare

2.9.1 For the following activities referenced in schedule 1, table S1.1 (AR1) the operator shall maintain a closure and aftercare management plan.

2.10 Landfill gas management

2.10.1 The operator shall take appropriate measures, including, but not limited to, those specified in any approved landfill gas management plan, to:

(a) collect landfill gas; and

(b) control the migration of landfill gas.

2.10.2 The operator shall use the collected landfill gas to produce energy. If the collected landfill gas cannot be used to produce energy, the operator shall use appropriate measures to flare or treat the gas in accordance with an approved landfill gas management plan.

2.10.3 The operator shall:

(a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a revised landfill gas management plan;

(b) implement the revised landfill gas management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 The limits in schedule 3 shall not be exceeded.

3.1.2 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3, tables S3.2 and S3.3.

3.1.3 The limits given in schedule 3, table S3.2 shall not be exceeded, save that for activity AR8 compliance with an emission limit in that table shall include incorporation of the uncertainty allowance stated in Environment Agency guidance LFTGN 05 and LFTGN 08.

3.1.4 The operator shall prevent the input of any hazardous substances from the activities into groundwater.

3.1.5 The operator shall submit to the Environment Agency a review of the Hydrogeological Risk Assessment:

(a) between nine and six months prior to the fourth anniversary of the granting of the permit; and

(b) between nine and six months prior to every subsequent six years after the fourth anniversary of the granting of the permit.

3.1.6 For the following activities referenced in schedule 1, table S1.1; (A2, AR3, AR4, AR5) periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) Leachate specified in tables S3.1 and S3.9;

(b) Point source emissions specified in tables S3.2 and S3.3;

(c) Groundwater specified in tables S3.4 and S3.7;

(d) Landfill gas specified in tables S3.5, S3.6 and S3.8;

(e) Surface water specified in table S3.10;

(f) Ambient air specified in table S3.11;

(g) Soil quality specified in table S3.12A and

(h) Process monitoring as specified in tables S3.12B and 3.13.

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 For the following activities referenced in schedule 1, table S1.1 (AR1) a topographical survey of the site referenced to ordnance datum shall be carried out and shall be used to produce a plan of a scale adequate to show the surveyed features of the site:

(a) annually; and

(b) prior to the disposal of waste in any new cell or new development area of the landfill; and

(c) following closure of the landfill or part of the landfill.

3.6 Pests

3.6.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.

3.6.2 The operator shall:

(a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution from pests;

(b) implement the pests management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.7 Fire prevention

3.7.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.

3.7.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;

(b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) the results of groundwater monitoring;

(ii) sub-surface landfill gas monitoring;

(iii) leachate levels, quality and quantities;

(iv) landfill gas generation and collection;

(v) waste types and quantities;

(vi) the specification and as built drawings of the basal, sidewall and capping engineering systems.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year ('the annual report') shall be submitted to the Environment Agency by 31st January each year or such other date as may be agreed in writing by the Agency, with the exception of 4.2.2(c) that must be provided by the end of February each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the risk assessments submitted in relation to this installation and any agreed amendments thereto. The review will include written descriptions of the improvements made to operational performance during the year, action plans developed and planned improvements for the coming year;

(b) the energy consumed at the site, reported in the format set out in schedule 4 table S4.3;

(c) the annual production/treatment set out in schedule 4, table S4.2;

(d) the topographical surveys required by condition 3.5.3 other than those submitted as part of a CQA validation report;

(e) the volumetric difference (reported in cubic metres) between the most recent topographical survey and the previous annual topographical survey i.e. the additional volume of the landfill void that is occupied by waste;

(f) an assessment of the settlement behaviour of the landfill body based on the difference between the most recent topographical survey and previous annual topographical survey for the areas of the landfill which did not receive waste between the surveys;

(g) a calculation of the remaining capacity (reported in cubic metres) derived from the pre-settlement contours and the most recent topographical survey;

(h) a plan(s) ('the monitoring and extraction point plan – MEPP') showing the locations of existing and any new leachate and landfill gas extraction and monitoring points;

(i) a review of the annual soil and leachate quality data obtained in accordance with conditions 3.5.1(g) and (h).

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4, table S4.1;

(b) using the forms specified in schedule 4, table S4.4 or other reporting format as agreed in writing with the Environment Agency; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.2.5 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.6 The operator shall submit to the Environment Agency a Short Rotation Coppice review report every 3 years by the 31 January. The report shall include for each plot:

(a) a summary of the following:

(i) all previous soil quality data;

(ii) leachate quality data for the 3 year period; and

(iii) total leachate volume applied during the 3 year period.

(b) total quantity of substances listed in table S3.12B applied over the 3 year period calculated from 4.2.6 (a)(ii) and (iii).

4.2.7 Where notified by the Environment Agency that the data submitted in accordance with condition 4.2.6 identify that activity AR2 of Table S1.1 is giving rise to pollution in the soil, the operator shall:

(a) submit for approval an action plan to reduce the concentration of those substances that are giving rise to pollution; and

(b) implement the approved action plan in accordance, from the date of approval, unless otherwise agree in writing by the Environment Agency.

4.3 Notifications

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(c) any change in the operator's name or address; and

(d) any steps taken with a view to the dissolution of the operator.

4.3.4 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities				
Activity reference	**WFD Annex I and II operations (where applicable)**	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
AR1	D5 –Specially engineered landfill; R5 - the recycling or reclamation of inorganic material and R10 – Land treatment resulting in benefit to agriculture or ecology	Section 5.2 Part A(1) (a), The disposal of waste in a landfill.	Landfill for non-hazardous waste and landfill restoration	Receipt, handling, storage and disposal of wastes, consisting of the types and quantities specified in conditions 2.7, as an integral part of landfilling.
AR2	D8 – Biological treatment of waste	Section 5.4, Part A(1)(a)(i), Biological treatment of non-hazardous waste	Treatment of leachate in a facility with a capacity of >50 tonnes/ day – Short rotation coppicing	Leachate arising from the installation and Carlton Forest Landfill (EPR/DP3836LS) and consisting of the types and quantities specified in condition 2.7.2, Table S2.2 and Tables 2, 3 and 4 of the 'Process Management Report No. 10247-R02' dated January 2017.
AR3	R5 - Recycling/reclamation of other inorganic compounds	Section 5.3 Part A1(a)(vi) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment	Biological treatment of hazardous waste for recovery	From receipt of waste through to storage of treated waste. Including addition of additives. All treatment and storage shall take place on an impermeable surface with a sealed drainage system Temporary storage of treated waste pending further treatment on-site or off-site recovery. Hazardous waste types and quantity as detailed in table S2.4

Table S1.1 activities				
Activity reference	**WFD Annex I and II operations (where applicable)**	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
AR4	R13 - Storage of hazardous waste prior to on-site treatment for the purpose of recovery	Section 5.6 Part A(1)(a)	Temporary storage of hazardous waste in a facility with a total capacity exceeding 50 tonnes.	From receipt of waste through to submission for treatment. All storage shall take place on an impermeable surface with a sealed drainage system Hazardous waste types and quantity as detailed in table S2.4
AR5	R5 – Biological treatment of non-hazardous waste for recovery	Section 5.4 Part A(1)(b)(i)	Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving biological treatment.	From receipt of waste through to storage of treated waste. All treatment and storage shall take place on an impermeable surface with a sealed drainage system Non-hazardous waste types and quantities as specified in Table S2.5
Directly Associated Activities				
AR6	R1 – use principally as a fuel to generate energy		Pre-treatment and utilisation of landfill gas for energy recovery in an appliance with a rated thermal input < 50MW	Treatment and utilisation of landfill gas arising from the landfill.
AR7	N/A		Temporary storage of waste (leachate)	Leachate arising from the landfill.
AR8	N/A		Flaring of landfill gas for disposal in an appliance.	Landfill gas arising from the landfill.
AR9	D6 – release to water body except seas/ oceans		Discharges of site drainage from the landfill.	From surface water management system to point of entry to controlled waters.

Table S1.1 activities				
Activity reference	**WFD Annex I and II operations (where applicable)**	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
AR10	N/A		Storage of fuel for operation of plant and equipment.	Fuel storage tank.
AR11	R13 - Storage of waste pending the operations numbered R1 and R13 (excluding temporary storage, pending collection, on the site where it is produced)		Storage of non-hazardous waste.	All storage shall take place on an impermeable surface with sealed drainage system. The maximum volume of combustible waste wood used as a process additive shall not exceed $30m^3$ Non-hazardous wastes types and quantities specified in table S2.5
AR12	N/A		Effluent treatment plant	Collection, storage and treatment of site surface water prior to reuse or tankering off site.
AR13	N/A		Abatement system	Operation of biofilter. Use of waste as specified in table S 2.7
AR14	R5: Recycling/reclamation of other inorganic compounds.		Screening of waste	Treatment operations shall be limited to: Physical treatment of non-hazardous wastes following biological treatment including screening for the purpose of recovery. Non-hazardous waste types as specified in Table 2.6.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	The response to questions 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10 and 2.11 of the Application excluding 2.2.49, 2.2.50, 2,2.51, 2.2.52, 2.2.53 and 2.2.57.	15/05/2007
Response to schedule 4 notice dated 24/01/2007	All sections	24/01/2008
Response to permit consultation 12/08/2009.	Internal memorandum, dated 12 August 2009, pertaining to active litter control measures operating on the site.	02/09/2009
Variation Application EPR/BW2986IW/V002	Technical assessment to support an application to vary the environmental permit, dated May 2011, version 1.0, sections 1, 2, 3, 4, 5, 6, 7 but excluding section 7.5	22/12/2011
Variation application EPR/BW2986IW/V002	H1 Risk assessment Part 1 and part 2	22/12/2011
Further information provided (letter reference AS0161 dated 13/02/2012)	All	13/02/2012
Establishment of Carbon Dioxide Background Concentrations and Revised Action Levels – Version 3	All	17/08/2016
Response to Schedule 5 Notice dated 19/06/2018	Surface water management technique as detailed in the response to question 3a of letter ref. 10247/L002/KW.	13/07/2018
Response to Schedule 5 Notice dated 30/07/20	Responses to: • Question 1 amending the removal of leachate level limits in line with the Environment Agency's recommendations in the CAR form (Report ID: NP3538MF/0356973). • Questions 2 providing updated monitoring frequency for leachate levels in cells which do not have the benefit of a fully engineered cap but excluding request for Table S3.1 to refers to just Drawing Reference number • Question 3 retaining the existing compliance limit for xylene. • Question 5 providing revised groundwater ammoniacal nitrogen compliance limit at GW05 and GW15.	18/09/2020
Additional information	Response to the follow up email in relation to Schedule 5 Notice Questions 2, 3, 5 & 6.	27/11/2020
Additional information	Updated Leachate Management Plan	16/12/2020
Application	Forms C2 and C3 submitted with the application	16/07/2021
Application	Waste pre-acceptance and acceptance confirmation as described in BAT Review document	
Response to Schedule 5 notice 06/08/2021	Response to questions 4, 6 – water collection 29, 30, 31 – water treatment. Associated appendices	01/10/2021
Response to email request for further	Email confirming EWC 19 02 05* will be soil from road sweepings contaminated with hydrocarbons	20/01/2022

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
information dated 07/01/2022		
Response to email request for further information dated 12/01/2022	Email confirming wheel wash waters are directed for treatment and recirculation. Surface water drawing 3982-CAU-XX-XX-DR-V-1813 Showing channelling and direction of follow of non-operational areas of the site.	22/02/2022

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The operator shall: • undertake an assessment of groundwater contamination identified in the down-gradient boreholes. The main borehole currently impacted is GW06, but elevated concentrations are also observed in GW05, GW07 and GW08 down gradient of Phases 1 & 2, and GW11, which is down-gradient of Cells 1-4. The main parameters of concern are chloride, manganese, magnesium and sodium; • carry out a review of the effectiveness of groundwater monitoring boreholes and consider improvements to the groundwater monitoring network (having regard to the Agency's Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water, February 2003 to achieve the spacing of boreholes) to provide a better understanding of the impacts (e.g. additional up gradient monitoring). A report detailing the findings shall be submitted to the Environment Agency for approval. The report shall: • seek to identify the cause of the contamination and, propose appropriate further monitoring infrastructure if required, in order to verify the cause of the contamination; • include a drawing showing the proposed location/s for installation of new or replacement boreholes. The Operator shall incorporate the additional monitoring locations into routine monitoring programme as specified in Tables S3.4 and S3.7	Complete
IC2	The boreholes agreed in compliance with improvement condition IC1 shall be installed having regard to the Agency's Guidance (LFTGN02) on Monitoring of Landfill Leachate, Groundwater and Surface Water.	Complete
IC3	The Operator shall monitor the composition of the groundwater at additional boreholes at least once every month for 12 months and carry out analysis for List I and List II substances and submit for the approval of the Agency a report including: • a review of the specified groundwater compliance locations, trigger substances and trigger levels for groundwater monitoring. All existing relevant compositional data from boreholes and the new additional boreholes shall be used to derive suitable triggers; and • an assessment of current on-going and additional monitoring to confirm the cause of the contamination and providing proposals for remedial measures, if Daneshill Landfill is confirmed to be the cause, to prevent further deterioration in groundwater quality and where possible, seek improvements in order to comply with the Groundwater Directive.	Complete
IC4	Following completion of the 2nd period of annual monitoring as specified in table S3.12A;	Complete

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	a) the chemical characteristics of the soils used within the SRC plots will be analysed by the operator for the list of parameters given in table 1 of figure CE-DHL0346-RP04TA-FA of the application, using the method detailed in CE-DHL0345-RP04TA-leachate treatment facility and short rotation coppicing SRC Daneshill Landfill site-Technical Assessment December 2011 version1.0 of the application. b) If the results of the monitoring required by (a) are above the limits specified in Table 9 of figure CE-DHL0346-RP04TA-F4 the operator shall submit details of an appropriate treatment activity to reduce limits obtained in (a) to below the limits set out in the table, or shall provide written details of further steps that are to be undertaken to reduce the limits to below the levels specified in table 9. c) the operator shall use the results obtained in a) and b) to develop a revised soil monitoring suite and monitoring frequency for inclusion in table S3.12A The requirements of c) above shall be implemented in accordance with Environment Agency written approval.	
IC5	The operator shall compare the results obtained in accordance with condition 3.5.1 (g) with the modelling submitted in support of the application and submit a report to the Environment Agency detailing, where appropriate, a revised monitoring suite and frequency for the individual process steps of the SRC treatment process. The results of the report shall only be implemented in Table S3.12B in accordance with Environment Agency written approval.	Complete
IC6	The operator shall review the limits of detection for the substances being analysed within tables S3.12A and S3.12B. The operator shall only implement use of the revised limit of detection with Environment Agency written approval.	Complete
IC7	The Operator shall submit to the Environment Agency for approval proposed action limits for carbon dioxide in external landfill gas monitoring boreholes BH12 and BHG32A. The proposed action limits shall be derived in accordance with the methodology in the Industry code of practice (ICoP) on Perimeter Soil Gas Emissions. Following approval of the proposed action limits the Operator shall update the site landfill gas management plan and landfill gas action plan as appropriate.	Complete
IC8	The Operator shall: a) Following the commencement of operations of the SRC and after 1 year of monitoring of the discharge from the containment channel of parameters as specified in Table S3.3, submit a report of the monitoring results to the Environment Agency for a written approval. The report shall include the results of discharge rate data obtained from the containment channel emission point specified in Table S3.3; b) Carry out a revised H1 risk assessment if there is a change in the discharge rate data used in the H1 assessment submitted with this application or if the results of the monitoring in a) are above the limits specified in Table S3.3 or show presence of substances where no limits are applied or substances that are currently not listed in Table S3.3; c) If the concentration of any of the assessed substances is found to be 'not insignificant' from the H1 assessment, submit a revised proposal of surface water discharge limits and a plan for ongoing monitoring to the Environment Agency for a written approval; and d) Implement any proposed changes in c) from the date and in accordance with written approval obtained from the Environment Agency.	Within 14 months from commencement of discharges to the SRC plots

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC9	The operator shall submit to the Environment Agency in writing for approval an updated Gas Management Plan which incorporates the action limits for carbon dioxide agreed under the improvement condition IC7.	30/06/2021
IC10	The operator shall carry out a review of the Off Specification Compost bio filter using emissions data obtained during the first year of operation in order to validate the description of the emissions provided in the application, and to demonstrate that the bio filter has been effective in preventing and where not possible minimising emissions released to air. Following this review the operator shall submit a written report to the Environment Agency for assessment and approval. The report shall include but not limited to the following aspects: • Summary of the technical characteristics of the biofilter (as installed), including filter media • Full investigation and characterisation of the inlet waste gas stream, including inlet gas monitoring results. • Emissions monitoring results covering the full range of contaminants identified in the inlet gas • Biofilter process monitoring results corresponding to periods of inlet gas and emissions monitoring • An interpretive description of the monitoring results, conclusions on abatement efficacy, and review against description and expected performance as detailed in the application. • Confirmation and justification of site-specific "action levels" and responses for parameters outside of optimal range • Consideration of improvement options (as appropriate), including the replacement or upgrading of the biofilter and/or CLO media • Recommendations for any identified improvements and timescales for their implementation. • Clarification of the tonnage of CLO disposed of. The operator shall implement the improvements in line with the timescales as approved by the Environment Agency.	12 months following commencement of operations
IC11	The operator shall submit a report to the Environment Agency for written approval reviewing the efficacy of the bioremediation process. The report shall include: • Amount of waste treated via bioremediation • Amount of waste treated within target timescales • Results of validation testing for successfully treated waste • Amount of waste re-treated • Amount of waste disposed of after bioremediation treatment. If the results of the report show significant retreatment of waste or unsuccessful treatment of waste via bioremediation after three rounds of treatment, the Operator shall submit proposals to improve the efficacy of the process along with the timescale for implementation to the Environment Agency for written approval. The Operator shall implement the proposals in line with the timescales agreed with the Environment Agency.	12 months following commencement of operations

Table S1.4 Pre-operational measures for future development		
Reference	**Operation**	**Pre-operational Measures**
PO1	Installation of the leachate drainage system in future cells	The operator shall submit the final design of the leachate drainage system for all future cells to the Environment Agency for agreement in writing. The design shall include pipe spacing at a maximum of 30 metres or be calculated using Rowe Section 2.4 (Rowe et al 2004) in accordance with Environmental Permitting Guidance for landfill (EPR5.02) and spacing agreed in writing with the Environment Agency.
PO3	Discharge to the SRC plots	The operator shall confirm to the Agency that they have the following: A written Environmental Management System (EMS) and integrated Management Systems (IMS) which are concerned with the operation of the SRC treatment system. The EMS and IMS are to demonstrate that the operation of the SRC is consistent with the details of the application.
PO4	Discharge from the SRC containment channel	Prior to the discharge of surface water from the SRC containment channel, the Operator shall propose a sample point location that is representative of the emissions from the SRC. This sample point must be located prior to the introduction of site surface runoff water, or other diluting water (excluding runoff water from the SRC). The Operator shall submit a revised emission sample points layout plan to the Environment Agency for written approval.
PO5	Operation of the Soil Treatment Facility	Prior to the commencement of waste storage and treatment operations at the soil treatment facility, the operator shall install all impermeable surfacing and associated infrastructure including drainage systems and demonstrate to the Environment Agency for written agreement that it has been installed to an appropriate CQA standard and signed off by an appropriately qualified person.
PO6	Operation of the Soil Treatment Facility	Prior to the acceptance of waste, the operator shall provide a written report to the Environment Agency which demonstrates the wheel wash and associated equipment has been installed within the site boundary and is a full sealed system. The operations can commence once written approval has been issued from the Environment Agency.

Table S1.5 Annual waste input limits	
Category	**Limit Tonnes/ Year**
Non-hazardous waste	267,000
Waste for restoration	300,000
Leachate from offsite accepted at the onsite Leachate Treatment Plant	As agreed in writing with the Environment Agency prior to import of leachate from offsite.

Schedule 2 – Waste types

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
01 01	**wastes from mineral excavation**
01 01 01	wastes from mineral metalliferous excavation
01 01 02	wastes from mineral non-metalliferous excavation
01 03	**wastes from physical and chemical processing of metalliferous minerals**
01 03 06	tailings other than those mentioned in 01 03 04 and 01 03 05
01 03 08	dusty and powdery wastes other than those mentioned in 01 03 07
01 03 09	red mud from alumina production other than the wastes mentioned in 01 03 10
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
01 04 10	dusty and powdery wastes other than those mentioned in 01 04 07
01 04 11	wastes from potash and rock salt processing other than those mentioned in 01 04 07
01 04 12	tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07
01 05	**drilling muds and other drilling wastes**
01 05 04	freshwater drilling muds and wastes
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
02	**Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing**
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**
02 01 01	sludges from washing and cleaning
02 01 02	animal-tissue waste
02 01 03	plant-tissue waste
02 01 04	waste plastics (except packaging)
02 01 06	animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site
02 01 07	wastes from forestry
02 01 09	agrochemical waste other than those mentioned in 02 01 08
02 01 10	waste metal
02 02	**wastes from the preparation and processing of meat, fish and other foods of animal origin**
02 02 01	sludges from washing and cleaning
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
02 03	**wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation**
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation
02 03 02	wastes from preserving agents
02 03 03	wastes from solvent extraction
02 03 04	materials unsuitable for consumption or processing
02 03 05	sludges from on-site effluent treatment
02 04	**wastes from sugar processing**
02 04 01	soil from cleaning and washing beet
02 04 02	off-specification calcium carbonate
02 04 03	sludges from on-site effluent treatment
02 05	**wastes from the dairy products industry**
02 05 01	materials unsuitable for consumption or processing
02 05 02	sludges from on-site effluent treatment
02 06	**wastes from the baking and confectionery industry**
02 06 01	materials unsuitable for consumption or processing
02 06 02	wastes from preserving agents
02 06 03	sludges from on-site effluent treatment
02 07	**wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)**
02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials
02 07 02	wastes from spirits distillation
02 07 03	wastes from chemical treatment
02 07 04	materials unsuitable for consumption or processing
02 07 05	sludges from on-site effluent treatment
03	**Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard**
03 01	**wastes from wood processing and the production of panels and furniture**
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	**wastes from pulp, paper and cardboard production and processing**
03 03 01	waste bark and wood
03 03 02	green liquor sludge (from recovery of cooking liquor)
03 03 05	de-inking sludges from paper recycling
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 09	lime mud waste
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
03 03 11	sludges from on-site effluent treatment other than those mentioned in 03 03 10
04	**Wastes from the leather, fur and textile industries**
04 01	**wastes from the leather and fur industry**
04 01 01	fleshings and lime split wastes
04 01 02	liming waste
04 01 06	sludges, in particular from on-site effluent treatment containing chromium
04 01 07	sludges, in particular from on-site effluent treatment free of chromium
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
04 01 09	wastes from dressing and finishing
04 02	**wastes from the textile industry**
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	organic matter from natural products (for example grease, wax)
04 02 15	wastes from finishing other than those mentioned in 04 02 14
04 02 17	dyestuffs and pigments other than those mentioned in 04 02 16
04 02 20	sludges from on-site effluent treatment other than those mentioned in 04 02 19
04 02 21	wastes from unprocessed textile fibres
04 02 22	wastes from processed textile fibres
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 10	sludges from on-site effluent treatment other than those mentioned in 05 01 09
05 01 13	boiler feedwater sludges
05 01 14	wastes from cooling columns
05 01 16	sulphur-containing wastes from petroleum desulphurisation
05 01 17	bitumen
05 06	**wastes from the pyrolytic treatment of coal**
05 06 04	waste from cooling columns
05 07	**wastes from natural gas purification and transportation**
05 07 02	wastes containing sulphur
06	**Wastes from inorganic chemical processes**
06 03	**wastes from the MFSU of salts and their solutions and metallic oxides**
06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13
06 03 16	metallic oxides other than those mentioned in 06 03 15
06 05	**sludges from on-site effluent treatment**
06 05 03	sludges from on-site effluent treatment other than those mentioned in 06 05 02
06 06	**wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes**
06 06 03	wastes containing sulphides other than those mentioned in 06 06 02

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
06 09	**wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes**
06 09 02	phosphorous slag
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03
06 11	**wastes from the manufacture of inorganic pigments and opacificiers**
06 11 01	calcium-based reaction wastes from titanium dioxide production
06 13	**wastes from inorganic chemical processes not otherwise specified**
06 13 03	carbon black
07	**Wastes from organic chemical processes**
07 01	**wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals**
07 01 12	sludges from on-site effluent treatment other than those mentioned in 07 01 11
07 02	**wastes from the MFSU of plastics, synthetic rubber and man-made fibres**
07 02 12	sludges from on-site effluent treatment other than those mentioned in 07 02 11
07 02 13	waste plastic
07 02 15	wastes from additives other than those mentioned in 07 02 14
07 02 17	waste containing silicones other than those mentioned in 07 02 16
07 03	**wastes from the MFSU of organic dyes and pigments (except 06 11)**
07 03 12	sludges from on-site effluent treatment other than those mentioned in 07 03 11
07 04	**wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides**
07 04 12	sludges from on-site effluent treatment other than those mentioned in 07 04 11
07 05	**wastes from the MFSU of pharmaceuticals**
07 05 12	sludges from on-site effluent treatment other than those mentioned in 07 05 11
07 05 14	solid wastes other than those mentioned in 07 05 13
07 06	**wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics**
07 06 12	sludges from on-site effluent treatment other than those mentioned in 07 06 11
07 07	**wastes from the MFSU of fine chemicals and chemical products not otherwise specified**
07 07 12	sludges from on-site effluent treatment other than those mentioned in 07 07 11
08	**Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks**
08 01	**wastes from MFSU and removal of paint and varnish**
08 01 12	waste paint and varnish other than those mentioned in 08 01 11
08 01 14	sludges from paint or varnish other than those mentioned in 08 01 13
08 01 16	aqueous sludges containing paint or varnish other than those mentioned in 08 01 15
08 01 18	wastes from paint or varnish removal other than those mentioned in 08 01 17
08 02	**wastes from MFSU of other coatings (including ceramic materials)**

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
08 02 01	waste coating powders
08 02 02	aqueous sludges containing ceramic materials
08 03	**wastes from MFSU of printing inks**
08 03 07	aqueous sludges containing ink
08 03 13	waste ink other than those mentioned in 08 03 12
08 03 15	ink sludges other than those mentioned in 08 03 14
08 03 18	waste printing toner other than those mentioned in 08 03 17
08 04	**wastes from MFSU of adhesives and sealants (including water proofing products)**
08 04 10	waste adhesives and sealants other than those mentioned in 08 04 09
08 04 12	adhesive and sealant sludges other than those mentioned in 08 04 11
08 04 14	aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13
09	**Wastes from the photographic industry**
09 01	**wastes from the photographic industry**
09 01 07	photographic film and paper containing silver or silver compounds
09 01 08	photographic film and paper free of silver or silver compounds
09 01 10	single-use cameras without batteries
09 01 12	single-use cameras containing batteries other than those mentioned in 09 01 11
10	**Wastes from thermal processes**
10 01	**wastes from power stations and other combustion plants (except 19)**
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)
10 01 02	coal fly ash
10 01 03	fly ash from peat and untreated wood
10 01 05	calcium-based reaction wastes from flue-gas desulphurisation in solid form
10 01 07	calcium-based reaction wastes from flue-gas desulphurisation in sludge form
10 01 15	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14
10 01 17	fly ash from co-incineration other than those mentioned in 10 01 16
10 01 19	wastes from gas cleaning other than those mentioned in 10 01 05, 10 01 07 and 10 01 18
10 01 21	sludges from on-site effluent treatment other than those mentioned in 10 01 20
10 01 23	aqueous sludges from boiler cleansing other than those mentioned in 10 01 22
10 01 24	sands from fluidised beds
10 01 25	wastes from fuel storage and preparation of coal-fired power plants
10 01 26	wastes from cooling-water treatment
10 02	**wastes from the iron and steel industry**
10 02 01	wastes from the processing of slag
10 02 02	unprocessed slag

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
10 02 08	solid wastes from gas treatment other than those mentioned in 10 02 07
10 02 10	mill scales
10 02 12	wastes from cooling-water treatment other than those mentioned in 10 02 11
10 02 14	sludges and filter cakes from gas treatment other than those mentioned in 10 02 13
10 02 15	other sludges and filter cakes
10 03	**wastes from aluminium thermal metallurgy**
10 03 02	anode scraps
10 03 05	waste alumina
10 03 16	skimmings other than those mentioned in 10 03 15
10 03 18	carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17
10 03 20	flue-gas dust other than those mentioned in 10 03 19
10 03 22	other particulates and dust (including ball-mill dust) other than those mentioned in 10 03 21
10 03 24	solid wastes from gas treatment other than those mentioned in 10 03 23
10 03 26	sludges and filter cakes from gas treatment other than those mentioned in 10 03 25
10 03 28	wastes from cooling-water treatment other than those mentioned in 10 03 27
10 03 30	wastes from treatment of salt slags and black drosses other than those mentioned in 10 03 29
10 04	**wastes from lead thermal metallurgy**
10 04 10	wastes from cooling-water treatment other than those mentioned in 10 04 09
10 05	**wastes from zinc thermal metallurgy**
10 05 01	slags from primary and secondary production
10 05 04	other particulates and dust
10 05 09	wastes from cooling-water treatment other than those mentioned in 10 05 08
10 05 11	dross and skimmings other than those mentioned in 10 05 10
10 06	**wastes from copper thermal metallurgy**
10 06 01	slags from primary and secondary production
10 06 02	dross and skimmings from primary and secondary production
10 06 04	other particulates and dust
10 06 10	wastes from cooling-water treatment other than those mentioned in 10 06 09
10 07	**wastes from silver, gold and platinum thermal metallurgy**
10 07 01	slags from primary and secondary production
10 07 02	dross and skimmings from primary and secondary production
10 07 03	solid wastes from gas treatment
10 07 04	other particulates and dust
10 07 05	sludges and filter cakes from gas treatment
10 07 08	wastes from cooling-water treatment other than those mentioned in 10 07 07
10 08	**wastes from other non-ferrous thermal metallurgy**

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
10 08 04	particulates and dust
10 08 09	other slags
10 08 11	dross and skimmings other than those mentioned in 10 08 10
10 08 13	carbon-containing wastes from anode manufacture other than those mentioned in 10 08 12
10 08 14	anode scrap
10 08 16	flue-gas dust other than those mentioned in 10 08 15
10 08 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 08 17
10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19
10 09	**wastes from casting of ferrous pieces**
10 09 03	furnace slag
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07
10 09 10	flue-gas dust other than those mentioned in 10 09 09
10 09 12	other particulates other than those mentioned in 10 09 11
10 09 14	waste binders other than those mentioned in 10 09 13
10 09 16	waste crack-indicating agent other than those mentioned in 10 09 15
10 10	**wastes from casting of non-ferrous pieces**
10 10 03	furnace slag
10 10 06	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05
10 10 08	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07
10 10 10	flue-gas dust other than those mentioned in 10 10 09
10 10 12	other particulates other than those mentioned in 10 10 11
10 10 14	waste binders other than those mentioned in 10 10 13
10 10 16	waste crack-indicating agent other than those mentioned in 10 10 15
10 11	**wastes from manufacture of glass and glass products**
10 11 03	waste glass-based fibrous materials
10 11 05	particulates and dust
10 11 10	waste preparation mixture before thermal processing, other than those mentioned in 10 11 09
10 11 12	waste glass other than those mentioned in 10 11 11
10 11 14	glass-polishing and -grinding sludge other than those mentioned in 10 11 13
10 11 16	solid wastes from flue-gas treatment other than those mentioned in 10 11 15
10 11 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 11 17
10 11 20	solid wastes from on-site effluent treatment other than those mentioned in 10 11 19

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
10 12	**wastes from manufacture of ceramic goods, bricks, tiles and construction products**
10 12 01	waste preparation mixture before thermal processing
10 12 03	particulates and dust
10 12 05	sludges and filter cakes from gas treatment
10 12 06	discarded moulds
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09
10 12 12	wastes from glazing other than those mentioned in 10 12 11
10 12 13	sludge from on-site effluent treatment
10 13	**wastes from manufacture of cement, lime and plaster and articles and products made from them**
10 13 01	waste preparation mixture before thermal processing
10 13 04	wastes from calcination and hydration of lime
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)
10 13 07	sludges and filter cakes from gas treatment
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12
10 13 14	waste concrete and concrete sludge
11	**Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy**
11 01	**wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)**
11 01 10	sludges and filter cakes other than those mentioned in 11 01 09
11 01 14	degreasing wastes other than those mentioned in 11 01 13
11 02	**wastes from non-ferrous hydrometallurgical processes**
11 02 03	wastes from the production of anodes for aqueous electrolytical processes
11 02 06	wastes from copper hydrometallurgical processes other than those mentioned in 11 02 05
11 05	**wastes from hot galvanising processes**
11 05 01	hard zinc
11 05 02	zinc ash
12	**Wastes from shaping and physical and mechanical surface treatment of metals and plastics**
12 01	**wastes from shaping and physical and mechanical surface treatment of metals and plastics**
12 01 01	ferrous metal filings and turnings
12 01 02	ferrous metal dust and particles

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
12 01 03	non-ferrous metal filings and turnings
12 01 04	non-ferrous metal dust and particles
12 01 05	plastics shavings and turnings
12 01 13	welding wastes
12 01 15	machining sludges other than those mentioned in 12 01 14
12 01 17	waste blasting material other than those mentioned in 12 01 16
12 01 21	spent grinding bodies and grinding materials other than those mentioned in 12 01 20
15	**Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified**
15 01	**packaging (including separately collected municipal packaging waste)**
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 04	metallic packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 07	glass packaging
15 01 09	textile packaging
15 02	**absorbents, filter materials, wiping cloths and protective clothing**
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
16	**Wastes not otherwise specified in the list**
16 01	**end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**
16 01 03	end-of-life tyres
16 01 12	brake pads other than those mentioned in 16 01 11
16 01 17	ferrous metal
16 01 18	non-ferrous metal
16 01 19	plastic
16 01 20	glass
16 02	**wastes from electrical and electronic equipment**
16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15
16 03	**off-specification batches and unused products**
16 03 04	inorganic wastes other than those mentioned in 16 03 03
16 03 06	organic wastes other than those mentioned in 16 03 05
16 08	**spent catalysts**

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
16 08 01	spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07)
16 08 03	spent catalysts containing transition metals or transition metal compounds not otherwise specified
16 11	**waste linings and refractories**
16 11 02	carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01
16 11 04	other linings and refractories from metallurgical processes other than those mentioned in 16 11 03
16 11 06	linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 01	**concrete, bricks, tiles and ceramics**
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	**wood, glass and plastic**
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 03	**bituminous mixtures, coal tar and tarred products**
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 04	**metals (including their alloys)**
17 04 01	copper, bronze, brass
17 04 02	aluminium
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 04 11	cables other than those mentioned in 17 04 10
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	**insulation materials and asbestos-containing construction materials**
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
17 09	**other construction and demolition wastes**
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
18	**Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)**
18 01	**wastes from natal care, diagnosis, treatment or prevention of disease in humans**
18 01 04	wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
18 02	**wastes from research, diagnosis, treatment or prevention of disease involving animals**
18 02 03	wastes whose collection and disposal is not subject to special requirements in order to prevent infection
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 01	**wastes from incineration or pyrolysis of waste**
19 01 02	ferrous materials removed from bottom ash
19 01 12	bottom ash and slag other than those mentioned in 19 01 11
19 01 14	fly ash other than those mentioned in 19 01 13
19 01 16	boiler dust other than those mentioned in 19 01 15
19 01 18	pyrolysis wastes other than those mentioned in 19 01 17
19 01 19	sands from fluidised beds
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 03	premixed wastes composed only of non-hazardous wastes
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09
19 03	**stabilised/solidified wastes**
19 03 05	stabilised wastes other than those mentioned in 19 03 04
19 03 07	solidified wastes other than those mentioned in 19 03 06
19 04	**vitrified waste and wastes from vitrification**
19 04 01	vitrified waste
19 05	**wastes from aerobic treatment of solid wastes**
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost
19 06	**wastes from anaerobic treatment of waste**
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 08	**wastes from waste water treatment plants not otherwise specified**

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
19 08 01	screenings
19 08 02	waste from desanding
19 08 05	sludges from treatment of urban waste water
19 08 09	grease and oil mixture from oil/water separation containing only edible oil and fats
19 08 12	sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14	sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
19 09	**wastes from the preparation of water intended for human consumption or water for industrial use**
19 09 01	solid waste from primary filtration and screenings
19 09 02	sludges from water clarification
19 09 03	sludges from decarbonation
19 09 04	spent activated carbon
19 09 05	saturated or spent ion exchange resins
19 09 06	solutions and sludges from regeneration of ion exchangers
19 10	**wastes from shredding of metal-containing wastes**
19 10 01	iron and steel waste
19 10 02	non-ferrous waste
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03
19 10 06	other fractions other than those mentioned in 19 10 05
19 11	**wastes from oil regeneration**
19 11 06	sludges from on-site effluent treatment other than those mentioned in 19 11 05
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 01	paper and cardboard
19 12 02	ferrous metal
19 12 03	non-ferrous metal
19 12 04	plastic and rubber
19 12 05	glass
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 09	minerals (for example sand, stones)
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
19 13	**wastes from soil and groundwater remediation**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
19 13 06	sludges from groundwater remediation other than those mentioned in 19 13 05

Table S2.1 Permitted waste types for disposal at a landfill for non-hazardous waste (activity AR1)	
Waste code	**Description**
20	**Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions**
20 01	**separately collected fractions (except 15 01)**
20 01 01	paper and cardboard
20 01 02	glass
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 25	edible oil and fat
20 01 28	paint, inks, adhesives and resins other than those mentioned in 20 01 27
20 01 30	detergents other than those mentioned in 20 01 29
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 40	metals
20 01 41	wastes from chimney sweeping
20 02	**garden and park wastes (including cemetery waste)**
20 02 01	biodegradable waste
20 02 02	soil and stones
20 02 03	other non-biodegradable wastes
20 03	**other municipal wastes**
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 04	septic tank sludge
20 03 06	waste from sewage cleaning
20 03 07	bulky waste

Table S2.2 Permitted waste types accepted for leachate treatment (activity AR2)	
Waste code	**Description**
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 07	**landfill leachate**
19 07 03	landfill leachate other than those mentioned in 19 07 02

Table S2.3 Permitted waste types for restoration (activity AR3)	
Waste code	**Description**
01	Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals
01 04	wastes from physical and chemical processing of non-metalliferous minerals
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
02 04	wastes from sugar processing
02 04 01	soil from cleaning and washing beet
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
03 03	wastes from pulp, paper and cardboard production and processing
03 03 05	de-inking sludges from paper recycling
03 03 09	lime mud waste
10	**WASTES FROM THERMAL PROCESSES**
10 01	**wastes from power stations and other combustion plants (except 19)**
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)
10 01 02	coal fly ash
10 12	**wastes from manufacture of ceramic goods, bricks, tiles and construction products**
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 13	**wastes from manufacture of cement, lime and plaster and articles and products made from them**
10 13 14	waste concrete and concrete sludge
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 01	**concrete, bricks, tiles and ceramics**
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 05	wastes from aerobic treatment of solid wastes
19 05 03	off-specification compost
19 05 99	compost
19 08	wastes from waste water treatment plants not otherwise specified
19 08 05	sludges from treatment of urban waste water
19 09	wastes from the preparation of water intended for human consumption or water for industrial use

Table S2.3 Permitted waste types for restoration (activity AR3)	
Waste code	**Description**
19 09 02	sludges from water clarification
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 09	minerals (for example sand, stones)
19 13	wastes from soil and groundwater remediation
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20 02	garden and park wastes (including cemetery waste)
20 02 02	soil and stones

Table S2.4 Permitted waste types and quantities for the storage and biological treatment for recovery of hazardous waste (activities AR3 and AR4)	
Maximum quantity	No more than 29,999 tonnes of hazardous waste shall be accepted per year.
Exclusions	Wastes having any of the following characteristics shall not be accepted: Wastes consisting solely or mainly of dusts, powders or loose fibres; Waste liquids; Odorous wastes; Waste containing asbestos; Wastes with hazard codes HP1, HP2, HP3, HP9, HP12, HP15; Waste containing persistent organic pollutants (POPs). Wastes marked ADDITIVE ONLY are permitted only as a process additive in accordance with the operational techniques.
Waste code	**Description**
01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**
01 05	**wastes from physical and chemical processing of non-metalliferous minerals**
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing hazardous substances
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 05*	oil spills
13	**Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)**
13 05	**oil/water separator contents**
13 05 01*	solids from grit chambers and oil/water separators

Table S2.4 Permitted waste types and quantities for the storage and biological treatment for recovery of hazardous waste (activities AR3 and AR4)	
Maximum quantity	No more than 29,999 tonnes of hazardous waste shall be accepted per year.
Exclusions	Wastes having any of the following characteristics shall not be accepted: Wastes consisting solely or mainly of dusts, powders or loose fibres; Waste liquids; Odorous wastes; Waste containing asbestos; Wastes with hazard codes HP1, HP2, HP3, HP9, HP12, HP15; Waste containing persistent organic pollutants (POPs). Wastes marked ADDITIVE ONLY are permitted only as a process additive in accordance with the operational techniques.
Waste code	**Description**
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 02	**wood, glass and plastic**
17 02 01	Wood (ADDITIVE ONLY)
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 05*	dredging spoil containing hazardous substances
17 05 07*	track ballast containing hazardous substances
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 05*	sludges from physico/chemical treatment of road sweeping (soil wastes only) containing hazardous substances
19 08	**wastes from waste water treatment plants not otherwise specified**
19 08 13*	sludges containing hazardous substances from other treatment of industrial waste water
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 07	wood other than that mentioned in 19 12 06 (ADDITIVE ONLY)
19 13	**wastes from soil and groundwater remediation**
19 13 01*	solid wastes from soil remediation containing hazardous substances
19 13 03*	sludges from soil remediation containing hazardous substances

Table S2.5 Permitted waste types and quantities for biological treatment for recovery of non-hazardous waste (activities AR5 and AR11)	
Maximum quantity	No more than 20,001 tonnes of non-hazardous waste shall be accepted for treatment per year.
Exclusions	Wastes having any of the following characteristics shall not be accepted: Wastes consisting solely or mainly of dusts, powders or loose fibres; Waste liquids; Odorous wastes.
Waste code	**Description**
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 02	**wood, glass and plastic**
17 02 01	Wood (ADDITIVE ONLY)
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 08	track ballast other than those mentioned in 17 05 07

Table S2.6 Permitted waste types and quantities for AR14 Screening of non-hazardous wastes	
Maximum quantity	No more than 50,000 tonnes of non-hazardous waste (post treatment) shall be accepted for treatment per year.
Waste code	**Description**
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 13	**Wastes from soil and groundwater remediation**
19 13 02	Solid wastes from soil remediation other than those mentioned in 19 13 01

Table S2.7 Permitted waste types and quantities for AR13 use as biofilter medium	
Maximum quantity	**The total quantity of waste accepted at the site for the above activity shall be less than 1,000 tonnes a year.**
Waste code	**Description**
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 05	**Wastes from aerobic treatment of waste**
19 05 03	Off specification compost

Schedule 3 – Emissions and monitoring

Table S3.1 Leachate level limits and monitoring requirements			
Monitoring point reference/Description	**Limit**	**Monitoring frequency**	**Monitoring standard and method**
Operational Cells or Phases (Any cells or phases that do not have a final engineered cap agreed in accordance with the landfill engineering condition, 2.6)			
Leachate compliance and monitoring points **Phase 3B:** Cell 2 - LMH11C, LMPP Cell 3 - LMH11A, LMPQ **Phase 3:** Cell 5 - LMPF, LMPBa, Cell 8B - LMP07B, LMP08B Cell 9B - LMP09, LMP10 Cell 10B - LMP17, LMP18 Cell 10D – LMP19, LMP20 on Drawing 348M419.	1.5 m above basal liner	Monthly Note 1	As specified in Environment Agency Guidance TGN02 (February 2003) or such other subsequent guidance as may be agreed in writing with the Environment Agency. Or as otherwise agreed with the Agency as part of a leachate monitoring plan.
Leachate in the primary and secondary pre-treatment lagoons on Plan MEPP.	1 metre below the lowest level of the rim of each lagoon		
Non Operational Cells or Phases (Any cells or phases that have a final engineered cap agreed in accordance with the landfill engineering condition, 2.6)			

Table S3.1 Leachate level limits and monitoring requirements			
Monitoring point reference/Description	**Limit**	**Monitoring frequency**	**Monitoring standard and method**
Phase 1 - LMH01, LMH02, LMH03 Phase 2 LMH04, LMH05, LMH06 **Phase 3A:** Cell 1 - LMH07, LMPK Cell 2 - LMH08, LMPL, LMPDa Cell 3 - LMH09, LMPM **Phase 3B:** Cell 1 - LMH10, LMPN **Phase 3:** Cell 6 – LMPR, LMPS Cell 7 – LMP03, LMP04A Cell 8A – LMP05, LMP06A Cell 9A1 – LMP11, LMP12 Cell 9A2 – LMP13, LMP14 Cell 10A – LMP15, LMP16 on Drawing 348M419.	1.5m above basal liner	Quarterly	As specified in Environment Agency Guidance TGN02 (February 2003) or such other subsequent guidance as may be agreed in writing with the Environment Agency. Or as otherwise agreed with the Agency as part of a leachate monitoring plan.
Note 1: Frequency to be reduced to quarterly on Environment Agency agreement of CQA validation report following completion of the final engineered cap in each cell.			

Table S3.2 Point source emissions to air – emission limits and monitoring requirements						
Emission point Ref. & Location	**Parameter**	**Source**	**Limit (including unit)**	**Reference Period**	**Monitoring Frequency**	**Monitoring Standard or Method**
ENGINES A1 and A2 located in Gas Utilisation Compound shown on drawing 348G254 dated 14th August 2009.	Oxides of Nitrogen	Gas utilisation plant	650 mg/m^3	Hourly mean	Annually	As per M2 or such other subsequent guidance as may be agreed in writing with the Environment Agency
	CO		1500 mg/m^3			
	Total VOCs		1750 mg/m^3			
Flare 1 shown on drawing 348G254 dated 14th August 2009	Oxides of Nitrogen	Landfill Gas Flares	150 mg/m^3	Hourly mean	Annually	As per M2 or such other subsequent guidance as may be agreed in writing with the Environment Agency. Monitoring is unnecessary where the flare is active for <10% of the year.
	CO		50 mg/m^3			
	Total VOCs		10 mg/m^3			
Biofilter as shown on soil treatment activity layout plan	H_2S	Soil treatment facility biofilter	No limit set	Average value of 3 consecutive measurements of at least 30 minutes each	Every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis *
	NH_3		20 mg/m^3			EN ISO 21877 *
	Total volatile organic compounds (TVOC)		No limit set			BS EN 12619
	Particulate Matter (Dust)		No limit set			EN 13284-1

Table S3.3 Point source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point Ref. & Location	**Parameter**	**Source**	**Limit (including unit)**	**Reference Period**	**Monitoring Frequency**	**Monitoring Standard or Method**
SW04 sample point (National grid reference SK 67224 86644 Discharge No. 2) shown on ESID10B Receiving waters Ranskill Brook (NGR SK6707 8658)	Suspended Solids	Surface water settlement lagoon	30 mg/l	Spot Sample	Monthly	As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency
	Oil and grease		None visible	Visual inspection	Daily when operational	
	pH		Not <5 or >9	Spot sample	Monthly	
	Ammoniacal Nitrogen		0.5 mg/l	Spot sample	Monthly	
	Chloride		50 mg/l	Spot sample	Monthly	
SW11 as shown on plan 4, 348M419 dated 01/02/2016	Suspended Solids	Surface water run-off via ditch	30 mg/l	Spot Sample	Monthly	
	Oil and grease		None visible	Visual inspection	Daily when operational	
	pH		Not >5 or <9	Spot sample	Monthly	
	Ammoniacal Nitrogen		0.25 mg/l	Spot sample	Monthly	
	Chloride		180 mg/l	Spot sample	Monthly	
Emission point agreed in line with pre-operational condition PO4 Final receiving waters Ranskill Brook	Discharge flow rate	Surface water runoff from SRC area	110 m^3/day	Instantaneous	Continuous when discharging	
	Visible oil and grease		None visible	Visual check	Prior to discharge, with a maximum frequency of once per week	
	pH		6 – 9	Spot sample		
	Suspended Solids		50 mg/l			
	Ammoniacal Nitrogen		3.5 mg/l			
	BOD		30 mg/l			

Table S3.3 Point source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point Ref. & Location	**Parameter**	**Source**	**Limit (including unit)**	**Reference Period**	**Monitoring Frequency**	**Monitoring Standard or Method**
	Chloride		1,560 mg/l			
	Iron		6.3 mg/l			
	Manganese		760 µg/l			
	Chromium		21 µg/l			
	Copper		8 µg/l			
	Zinc		67 µg/l			
	Nickel		25 µg/l			
	Arsenic		310 µg/l			

Table S3.4 Groundwater – emission limits and monitoring requirements					
Monitoring point reference	**Parameter**	**Limit (including unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
GW08, GW09, GW12 and GW13.	Ammoniacal nitrogen	1.25 mg/l	Spot Sample	Quarterly	As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency
GW05		4.26 mg/l			
GW15		4.59 mg/l			
GW16		0.39 mg/l			
GW05, GW08, GW09, GW12 GW13, GW15 and GW16.	Chloride	250 mg/l			
GW05, GW08, GW09, GW12, GW15 and GW16.	Chromium	0.020 mg/l			
GW08, GW09, GW13, GW15 and GW16.	Mecoprop	0.0001mg/l			

Table S3.4 Groundwater – emission limits and monitoring requirements					
Monitoring point reference	**Parameter**	**Limit (including unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
GW05, GW08, GW09, GW13 GW15 and GW16.	Xylene	0.003 mg/l			

Table S3.5 Landfill gas in external monitoring boreholes – limits and monitoring requirements				
Monitoring point Ref. /description	**Parameter**	**Limit (including units)**	**Monitoring frequency**	**Monitoring standard or method**
BHG01, BHG02, BHG03, BHG04, BHG05, BHG06, BHG07, BHG08, BHG10, BHG14, BHG17, BHG18, BHG19, BHG20, BHG21, BHG22, BHG23, BHG24, BHG25, BHG27, BHG28, BHG29, BHG30, BHG31, BHG32, BHG32A, BHG34, BHG35, BHG36, BHG37, BHG38, BHG39, BHG40, BHG41, BHG42, BHG43, BHG44, BHG45, BHG46, BHG47, BHG48 and BHG49.	Methane	1 %v/v	Monthly	As per LFTGN03 (September 2004) or such other subsequent guidance as may be agreed in writing with the Environment Agency. Record whether the ground is: • waterlogged • frozen • snow covered
	Oxygen	No limit set		
	Atmospheric pressure	No limit set		
	Differential Pressure	No limit set		
BHG09, BHG11, BHG13 and BHG16.	Methane	5.0 %v/v		
BHG12A.	Methane	5.4%		
BHG15.	Methane	2.8 %v/v		
BHG09, BHG11, BHG12A, BHG13, BHG15, BHG16 and BHG33.	Oxygen	No limit set		
	Atmospheric pressure	No limit set		
	Differential pressure	No limit set		
BHG01, BHG02, BHG03, BHG04, BHG05, BHG06, BHG07, BHG08, BHG09, BHG10, BHG11, BHG12A, BHG13, BHG14, BHG15, BHG16, BHG17, BHG18, BHG19, BHG20, BHG21, BHG22, BHG23, BHG24, BHG25, BHG26A, BHG27, BHG28, BHG29, BHG30,	Carbon Dioxide	No limit set		

Table S3.5 Landfill gas in external monitoring boreholes – limits and monitoring requirements				
Monitoring point Ref. /description	**Parameter**	**Limit (including units)**	**Monitoring frequency**	**Monitoring standard or method**
BHG31, BHG32, BHG32A, BHG33, BHG34, BHG35, BHG36, BHG37, BHG38, BHG39, BHG40, BHG41, BHG42, BHG43, BHG44, BHG45, BHG46, BHG47, BHG48 and BHG49				

Table S3.6 Landfill gas emissions from capped surfaces for cells that have accepted non-hazardous biodegradable waste – monitoring requirements			
Monitoring point Ref. /description	**Parameter**	**Monitoring frequency**	**Monitoring Standard or method**
Permanently capped zone	Methane concentration	Every 12 months	As per LFTGN 07 (v2 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency.
Temporarily capped zone	Methane concentration	Every 12 months	As per LFTGN 07 (v2 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency.
Whole site	Total methane emission	As agreed with the Environment Agency	As per LFTGN 07 (v2 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency.
Uncapped areas	Methane concentration	Every 12 months	As agreed with the Environment Agency based on the wording of revised LFTGN 07 or landfill sector guidance or such other subsequent guidance as may be agreed in writing with the Environment Agency.

Table S3.7 Groundwater – other monitoring requirements			
Monitoring Point Ref./Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**
Up gradient MEPP	Water level, Ammoniacal Nitrogen, Chloride, Electrical Conductivity, pH	Quarterly	As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments

	Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, Total Alkalinity, Total Sulphates, Zinc	Annually	for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency
	Hazardous substances.	Annually for first six years of operation	
Down or cross gradient MEPP	Water level, Ammoniacal Nitrogen, Chloride, Electrical Conductivity, pH	Quarterly	As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency After the initial 6 year monitoring period for hazardous substances, if the results of quarterly or annual monitoring suggest an increase in contamination, the operator shall also undertake a full leachate hazardous substances screen.
	Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, Total Alkalinity, Total Sulphates, Zinc	Annually	
	Hazardous substances detected in leachate.	Annually for first six years of operation then every two years	
MEPP	Base of monitoring point (mAoD).	Annually	

Table S3.8 Landfill gas – other monitoring requirements				
Monitoring Point Ref. /Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
In waste gas monitoring boreholes or sealed leachate wells or sacrificial gas extraction system	Methane Carbon Dioxide Oxygen Carbon Monoxide Differential pressure Atmospheric pressure	Monthly until gas extraction commences	Calibrated handheld monitoring instrument	For cells or phases which have no active gas extraction. Gas extraction system shall be installed and extraction commenced once monitoring shows onset of methane production in waste at a rate that can be sustainably extracted. Once gas extraction has commenced in a particular cell or phase, there is no longer a requirement to carry out this monitoring.
	Hydrogen Sulphide	Quarterly	Calibrated handheld monitoring instrument or Tedlar Bag sample in accordance with LFTGN04 (v3, March 2010) or other such subsequent guidance as may be agreed in writing with the Environment Agency or a method agreed with the Environment Agency.	For cells or phases which have no active gas extraction. Once gas extraction has commenced in a particular cell or phase, there is no longer a requirement to carry out this monitoring. Concentrations of hydrogen sulphide shall be assessed in accordance with the gas and odour management plans

Table S3.8 Landfill gas – other monitoring requirements				
Monitoring Point Ref. /Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Gas collection system at well control valve, manifolds (if applicable) and strategic points on gas system	Methane Carbon Dioxide Oxygen Carbon Monoxide Atmospheric pressure Gas flow rate or suction % Balance Gas (calculated as the difference between the sum of measured gases and 100%)	Monthly or at such other frequency as may be agreed in writing with the Environment Agency.	Calibrated handheld monitoring instrument	Where the oxygen concentration exceeds 5% or the % balance gas is greater than 20% an assessment of air ingress into the system shall be undertaken. Where the concentration of carbon monoxide exceeds 100ppm then further investigation shall be undertake Record the ambient air temperature and whether the ground is: waterlogged frozen snow covered
Gas collection system at well control valve	Hydrogen sulphide	Six monthly	Calibrated handheld monitoring instrument or Tedlar Bag sample in accordance with LFTGN04 (v3, March 2010) or other such subsequent guidance as may be agreed in writing with the Environment Agency or a method agreed with the Environment Agency.	Concentrations of hydrogen sulphide shall be assessed in accordance with the gas and odour management plans
Output to flare or LFG Utilisation Compound	Trace gas	Annually	Trace gas analysis in accordance with LFTGN04 (v3, March 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency [or a trace gas characterisation method agreed with the Environment Agency].	The concentration of trace gas components shall be assessed against the assumptions made in the Landfill gas risk assessment and dispersion modelling.

Table S3.8 Landfill gas – other monitoring requirements				
Monitoring Point Ref. /Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Output to flare or LFG Utilisation Compound	Methane Carbon Dioxide Oxygen Gas flow rate Suction % Balance Gas (calculated as the difference between the sum of measured gases and 100%)	Weekly		Where the oxygen concentration exceeds 5% or the % balance gas is greater than 20% an assessment of air ingress into the system shall be undertaken.
Flares 1 shown on drawing 348G254 dated 14th August 2009	Temperature	As per LFTGN05 (v2, March 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency.	As per M2 or such other subsequent guidance as may be agreed in writing with the Environment Agency.	
A1, A2 Gas engine, post turbo	NOx and CO	Quarterly	In accordance with Appendix C of LFTGN08, v2, 2010) or such other subsequent guidance as may be agreed in writing with the Environment Agency.	Where monitoring using hand-held, electrochemical equipment indicates an exceedance of the emissions standards specified in Table S3.2, these shall be used as action levels and the operator shall investigate the cause and take appropriate measures to reduce emissions.

Table S3.9 Leachate – other monitoring requirements				
Monitoring point reference or description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Operational Cells or Phases **(Any cell or phases that do not have a final engineered cap agreed in accordance with condition 2.6)**			At leachate compliance point as listed in table S3.1. As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency	
MEPP	Ammoniacal Nitrogen, Arsenic, BOD, Cadmium, Calcium, Chloride, Chromium, COD, Copper, Electrical Conductivity, Iron, Lead, Magnesium, Manganese, Nickel, pH, Potassium, Sodium, Total Alkalinity, Total Sulphates, Zinc	Quarterly		None
MEPP	Hazardous substances	Annually		None
MEPP	Depth to base (mAoD)	Annually		None
Non Operational Cells or Phases **(Any cell or phases that have a final engineered cap agreed in accordance with condition 2.6)**				
MEPP	Ammoniacal Nitrogen, Arsenic, BOD, Cadmium, Calcium, Chloride, Chromium, COD, Copper, Electrical Conductivity, Iron, Lead, Magnesium, Manganese, Nickel, pH, Potassium, Sodium, Total Alkalinity, Total Sulphates, Zinc	Annually		
MEPP	Hazardous substances	Once every four years		None
MEPP	Depth to base (mAoD)	Annually		

Table S3.10 Surface water – other monitoring requirements				
Monitoring Point Ref. /Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
MEPP	Ammoniacal Nitrogen Chloride Suspended Solids Visual Oil and Grease pH Electrical conductivity	Monthly	Spot sample	As specified in Environment Agency Guidance TGN02 'Monitoring of Landfill Leachate, Groundwater and Surface Water' (February 2003), risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency

Table S3.11 Ambient air – other monitoring requirements				
Monitoring Point Ref. /Description	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Installation boundary	Hydrogen sulphide N02 in ambient air	Monthly	Spot sample	On olfactory detection(1)
1. Upon receipt of complaint(s) and investigation and monitoring programme is to be instigated and details submitted to the Agency for approval.				

S3.12A Soil monitoring requirements			
Monitoring Point Reference / Description	**Parameter**	**Monitoring Frequency**	**Monitoring Standard or Method**
Soil SS1, SS2, SS3, SS4, SS5 as shown on drawing CE-DHL 0346-DW08 Final dated 19 December 2011 – Composite sample for each of the SRC plots derived from a minimum of 10 representative sub-samples per plot.	Rainfall, surface water run-off, evaporation, transpiration and soil moisture content	Immediately prior to each application of treated leachate	As per LFTGN02 issued February 2003 'Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water', risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance
	pH	Bi-annually (March and November).	
	Arsenic		
	Cadmium		
	Chromium		
	Copper		

S3.12A Soil monitoring requirements			
Monitoring Point Reference / Description	**Parameter**	**Monitoring Frequency**	**Monitoring Standard or Method**
	Fluoride		as may be agreed in writing with the Environment Agency
	Lead		
	Mercury		
	Molybdenum		
	Nickel		
	Selenium		
	Zinc		
	Phosphorous		
	Potassium		
	Magnesium		
	Sodium		
	Chloride		
	Electrical conductivity		

Table S3.12B Process monitoring requirements			
Emission point reference or source of description of point of measurement	**Parameter**	**Monitoring Frequency**	**Monitoring standard or Method**
Raw Leachate Feed	Volume transferred to primary treatment	Monthly	As per LFTGN02 issued February 2003 'Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water', risk assessments for your environmental permit (www.gov.uk) or such other subsequent guidance as may be agreed in writing with the Environment Agency
Primary pre-treatment effluent	Volume transferred to secondary treatment		
Secondary pre-treatment effluent	Volume transferred to SRC		
Leachate prior to application to the SRC	pH		
	Electrical conductivity		
	Ammoniacal nitrogen		
	COD		
	BOD		
	TOC		
	Calcium		
	Magnesium		

	Sodium		
	Potassium		
	Chloride		
	Sulphate		
	Alkalinity		
	Iron		
	Manganese		
	Cadmium		
	Mercury		
	Lead		
	Copper		
	Chromium		
	Nickel		
	Zinc		
	Arsenic		
	MCPP (Mecoprop)		
	MCPB		
	Chloroxun		
	Metoxuron		
	Dichlorprop		
	Chlorobenzene		
	Isoproturon		
	Linuron		
	Benazolin		
	Benzene		
	Ethyl Benzene		
	Toluene		
	m,p-xylene		
	o-xylene		
	p-isopropyltoluene		
	1,3,5-trimethylbenzene		
	Acenaphthene		
	Acenaphthylene		

	Anthracene		
	Fluoranthene		
	Fluorene		
	Naphthalene		
	Pyrene		
	Phenanthrene		
	MTBE		

Table S3.13 Process monitoring requirements at the Soil Treatment Facility

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Biofilter as shown on Soil Treatment Activity Layout Plan in Schedule 7	Temperature	Monthly	As per monitoring standard agreed as part of Improvement condition IC7	Biofilter shall be checked and maintained to ensure appropriate temperature and moisture content on a daily basis. Monitoring equipment shall be available on-site and used as required to ensure compliance with this permit.
	Moisture content			
	Flow rate			
	Nutrient levels			
	Contaminant elimination			
	Grain size			
	Total Nitrogen (mg/kg)			
	Total Phosphorus (mg/kg)			
	pH			
Soil biopiles	Total Petroleum Hydrocarbons (TPH) Polycyclic Aromatic Hydrocarbons (PAHs) Total Volatile Organic Compounds (VOCs) Phenols pH	Each completed batch of treated soil shall be sampled	-	Laboratory must be accredited to EN ISO/IEC ISO17025:2000 for the analysis specified Samples to be obtained using standard sampling procedures as per BS 812

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data		
Parameter	**Reporting period**	**Period ends**
Leachate and/ or groundwater level As specified by Schedule 3, table S3.1	Every 3 months	31 March, 30 June, 30 September, 31 December
Point source emission to air As specified by Schedule 3, table S3.2	Every 12 months	31 December
Point source emission to water (other than sewer) As specified by Schedule 3, table S3.3	Every 3 months	31 March, 30 June, 30 September, 31 December
Emission to groundwater As specified by Schedule 3, table S3.4	Every 3 months	31 March, 30 June, 30 September, 31 December
Landfill gas in external monitoring boreholes As specified by Schedule 3, table S3.5	Every 3 months	31 March, 30 June, 30 September, 31 December
Emission of landfill gas from capped surfaces As specified by Schedule 3, table S3.6	Every 12 months	31 December
Other groundwater monitoring As specified by Schedule 3, table S3.7	Every 3 months	31 March, 30 June, 30 September, 31 December
Other Landfill gas monitoring As specified by Schedule 3, table S3.8	Every 3 months	31 March, 30 June, 30 September, 31 December
Trace gas monitoring	Every 12 months	31 December
Other surface water monitoring As specified by Schedule 3, table S3.10	Every 12 months	31 December
Other leachate monitoring As specified by Schedule 3, table S3.9	Every 12 months	31 December
Meteorological data Landfill Directive, Annex III, Section 2	Every 12 months	31 December
Other ambient air monitoring As specified by Schedule 3, table S3.11	Every 12 months	31 December
Soil quality As specified by Schedule 3, table S3.12A	Every 12 months	31 December
Process monitoring As specified by Schedule 3, table S3.12B	Every 12 months	31 December
Biofilter efficiency parameters as required by condition 3.5.1	Every 12 months	31 December

* - where the reporting period is 12 months, you may submit this information as part of the 'annual report' required by condition 4.2.2.

Table S4.2: Annual production/treatment	
Leachate: Disposed of offsite; Disposed of to any onsite effluent treatment plant; Recirculated into the waste mass. Accepted from offsite for treatment at any onsite effluent treatment plant.	Cubic metres/year
Landfill gas: combustion in flares; combustion in gas engines; Other methods of gas utilisation. Average methane content entering the landfill gas utilisation or treatment compound (based on the annual average of Table S3.8 monitoring) Methane generation rate (50%ile from a representative model)	Normalised cubic metres/year % methane v/v m^3/hr

Table S4.3 Performance Parameters			
Parameter	**Frequency of assessment**	**Annual total**	**Unit**
Energy used (including for leachate treatment)	Annually		MWh of electricity or natural gas

Table S4.4 Reporting Forms		
Media/parameter	**Reporting Format**	**Date of Form**
Leachate	Form leachate 1 or other reporting format to be agreed in writing with the Environment Agency	13/11/09
Air	Form Air 1 or other reporting format to be agreed in writing with the Environment Agency	13/11/09
Controlled water	Form Water 1 or other reporting format to be agreed in writing with the Environment Agency	31/10/19
Groundwater	Form Groundwater 1 or other reporting format to be agreed in writing with the Environment Agency	13/11/09
Landfill gas	Form LFG 1 or other reporting format to be agreed in writing with the Environment Agency	13/11/09
Waste Return	Waste Return Form RATS2E	13/11/09
Landfill topographical surveys and interpretation	Reporting format to be agreed in writing with the Environment Agency	13/11/09
Other performance indicators (soil)	Form performance 1 or other form as agreed in writing by the Environment Agency	13/11/09

Schedule 5 – Notification

This page outlines the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any incident or accident which significantly affects or may significantly affect the environment	
To be notified within 24 hours of detection	
Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements in the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

"accident" means an accident that may result in pollution.

"annually" means once every year.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"Background concentration" means such concentration of that substance as is present in:

- For emissions to surface water, the surface water quality up-gradient of the site; or
- For emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge; or
- For emissions of landfill gas, the ground or air outside the site and not attributable to the site.

"cell layout drawing" means:

(a) A drawing or drawings of the proposed new cell that illustrate(s) in sufficient detail:

(i) the location of the new cell on the site;

(ii) the proposed level (Above Ordnance Datum) of the base of the excavation;

(iii) the proposed finished levels of all containment and leachate drainage layers;

(iv) the positions of leachate management infrastructure; and

(v) the positions of landfill gas infrastructure (if appropriate).

(b) A detailed written explanation of any minor design changes from the most recently approved cell that result from the new cell layout. This would include, for example:

(i) changes to slope length and gradient within the cell;

(ii) new leachate or landfill gas infrastructure construction design;

(iii) slope stability issues such as new basal excavation level; and/or

(iv) depth of waste.

"construction proposals" means written information, at a level of detail appropriate to the complexity and pollution risk, on the design, specifications of materials selected, stability assessment (where relevant) and the construction quality assurance (CQA) programme in relation to the New Cell or Landfill Infrastructure.

"CQA Validation Report" means the final "as built" construction and engineering details of the New Cell or of the Landfill Infrastructure. It must provide a comprehensive record of the construction and must include, where relevant:

- The results of all testing required by the CQA programme - this must include the records of any failed tests with a written explanation, details of the remedial action taken, referenced to the appropriate secondary testing;
- Plans showing the location of all tests;
- "As-built" plans and sections of the works;
- Copies of the site engineer's daily records;
- Records of any problems or non-compliances and the solution applied;

- Any other site specific information considered relevant to proving the integrity of the New Cell or Landfill Infrastructure;
- Validation by a qualified person that all of the construction has been carried out in accordance with the Construction Proposals.

"emissions to land" includes emissions to groundwater.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations 2016, SI 2016 No.1154 and words and expressions used in this permit which are also used in those Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit and for the purposes of the Short Rotation Coppice plots emission includes the application of treated leachate.

"exceeded" means that a value is above a permitted limit, or where a range of values or a minimum value is set as a permitted limit it means a value outside that range or below the minimum value, whichever is applicable.

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"hazardous property" has the meaning in Annex III of the Waste Framework Directive

"hazardous substances" as defined by the Environmental Permitting (England and Wales) Regulations 2016, SI 2016 No.1154, schedule 22 and listed in our Hydrogeological risk assessment guidance.

"hazardous waste" has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended)

"landfill Infrastructure" means any specified element of the:

- permanent capping;
- temporary capping (i.e. engineered temporary caps not cover materials);
- leachate abstraction systems;
- leachate transfer, treatment and storage systems;
- surface water drainage systems;
- leachate monitoring wells;
- groundwater monitoring boreholes;
- landfill gas monitoring boreholes;
- landfill gas management systems;
- lining within the installation.

within the site.

"inert waste" means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater

"liquids" means any liquid other than leachate within the engineered landfill containment system.

"List of Wastes" means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

"LFTGN 05" means Environment Agency Guidance for monitoring enclosed landfill gas flares.

"LFTGN 07" means Environment Agency Guidance on monitoring landfill gas surface emissions.

"LFTGN 08" means Environment Agency Guidance for monitoring landfill gas engines.

"M2" means Environment Agency Guidance Monitoring of stack emissions to air.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"medicinal product" means any medicine licensed by the Medicines and Healthcare products Regulatory Agency (MHRA) or their predecessors under the Medicines Act 1968, section 130.

"MEPP" Monitoring and extraction point plan, required by condition 4.2.2(h) to specify extraction points and routine monitoring locations.

"new Cell" means any new cell, part of a cell or other similar new area of the site where waste deposit is to commence after issue of this permit and can comprise:

- groundwater under-drainage system;
- permanent geophysical leak location system;
- leak detection layer;
- sub-grade;
- barriers;
- liners;
- leachate collection system;
- leachate abstraction system;
- separation bund/layer;
- cell or area surface water drainage system;
- side wall subgrade and containment systems;

for the New Cell.

"no impact" means that the change made to the construction process will not affect the agreed design criteria, specification or performance in a way that has a negative effect.

"pests" means Birds, Vermin and Insects.

"previous year" means the 12 month period preceding the month the annual report is submitted in.

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"Relevant waste acceptance procedures" means the procedure for the acceptance of waste at landfills and the associated sampling and test methods specified in the Council Decision Annex (2003/33/EC, European Council of 19 December 2002).

"relevant waste acceptance criteria" means the waste acceptance criteria and the associated sampling and test methods specified in the Council Decision Annex (2003/33/EC, European Council of 19 December 2002).

"review of the Hydrogeological Risk Assessment" means a written review of the hydrogeological risk assessment included in the Application, together with any other parts of the Application that addressed the requirements of the EP Regulations. The review shall assess whether the activities of disposal or tipping for the purpose of disposal of waste authorised by the permit continue to meet the requirements of the EP Regulations.

'sustainably extracted' means where suction can be applied to the extraction wells such that a flow rate of landfill gas, with a methane content capable of either being combusted, or treated by bio-oxidation, can be

extracted without increasing the risk of air ingress to the waste or inducing aerobic degradation within the waste.

"waste code" - See 'List of Wastes'.

"WFD" means Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste [and repealing certain Directives] – the Waste Framework Directive.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means the standards included in Environment Agency Guidance for Monitoring Enclosed Landfill Gas Flares LFTGN 05 or Guidance for Monitoring Landfill Gas Engine Emissions LFTGN 08

Where the following terms appear in the waste code list in Tables S2.1, S2.2 or S2.3 they have the meaning given below:

'hazardous substance' means a substance classified as hazardous as a consequence of fulfilling the criteria laid down in parts 2 to 5 of Annex I to Regulation (EC) No 1272/2008;

'heavy metal' means any compound of antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium and tin, as well as these materials in metallic form, as far as these are classified as hazardous substances;

'polychlorinated biphenyls and polychlorinated terphenyls' ('PCBs') means PCBs as defined in Article 2(a) of Council Directive 96/59/EC'.
Article 2(a) says that 'PCBs' means:

- polychlorinated biphenyls
- polychlorinated terphenyls
- monomethyl-tetrachlorodiphenyl methane, Monomethyl-dichloro-diphenyl methane, Monomethyldibromo-diphenyl methane
- any mixture containing any of the above mentioned substances in a total of more than 0,005 % by weight;

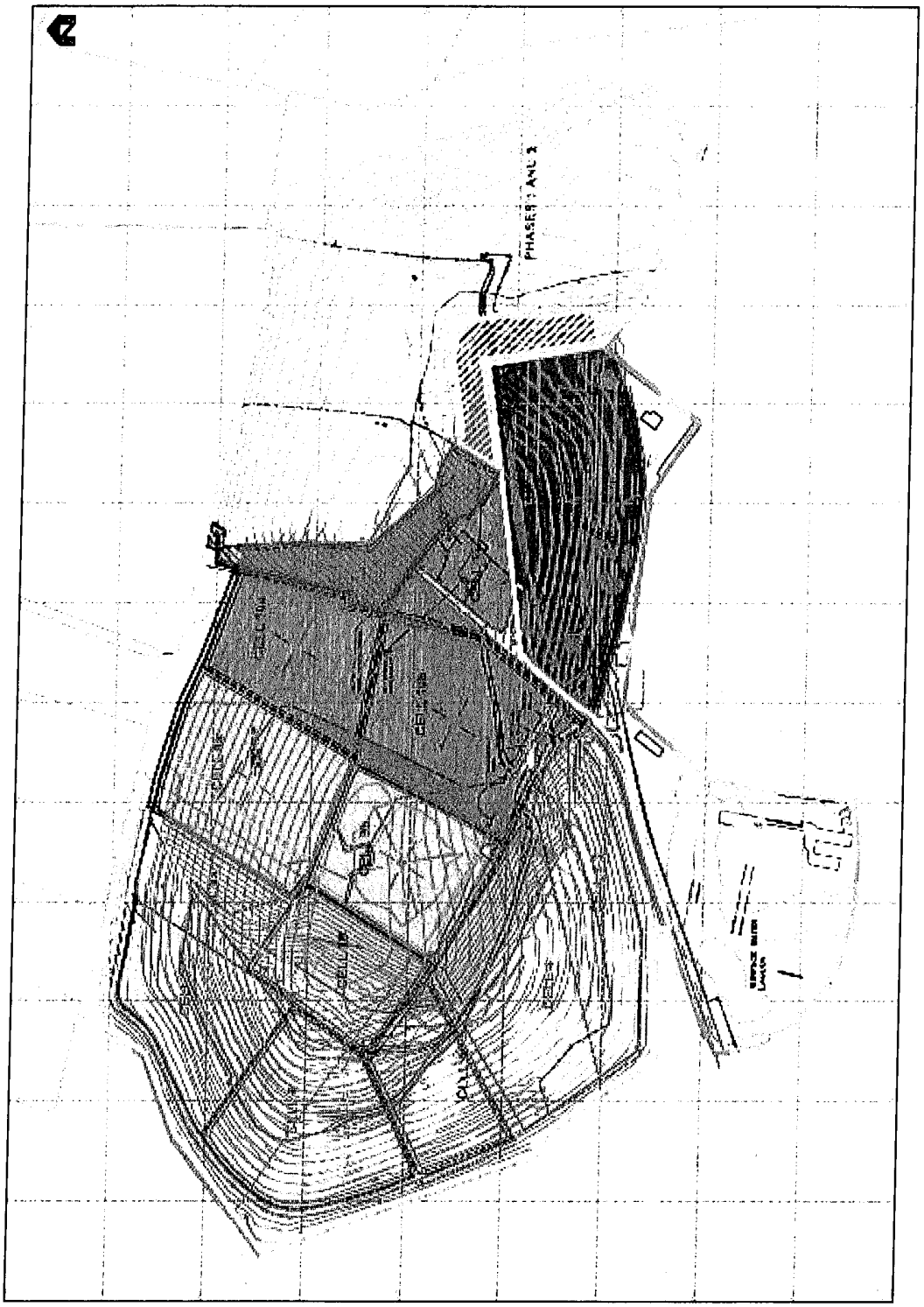
'transition metals' means any of the following metals: any compound of scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum and tantalum, as well as these materials in metallic form, as far as these are classified as hazardous substances;

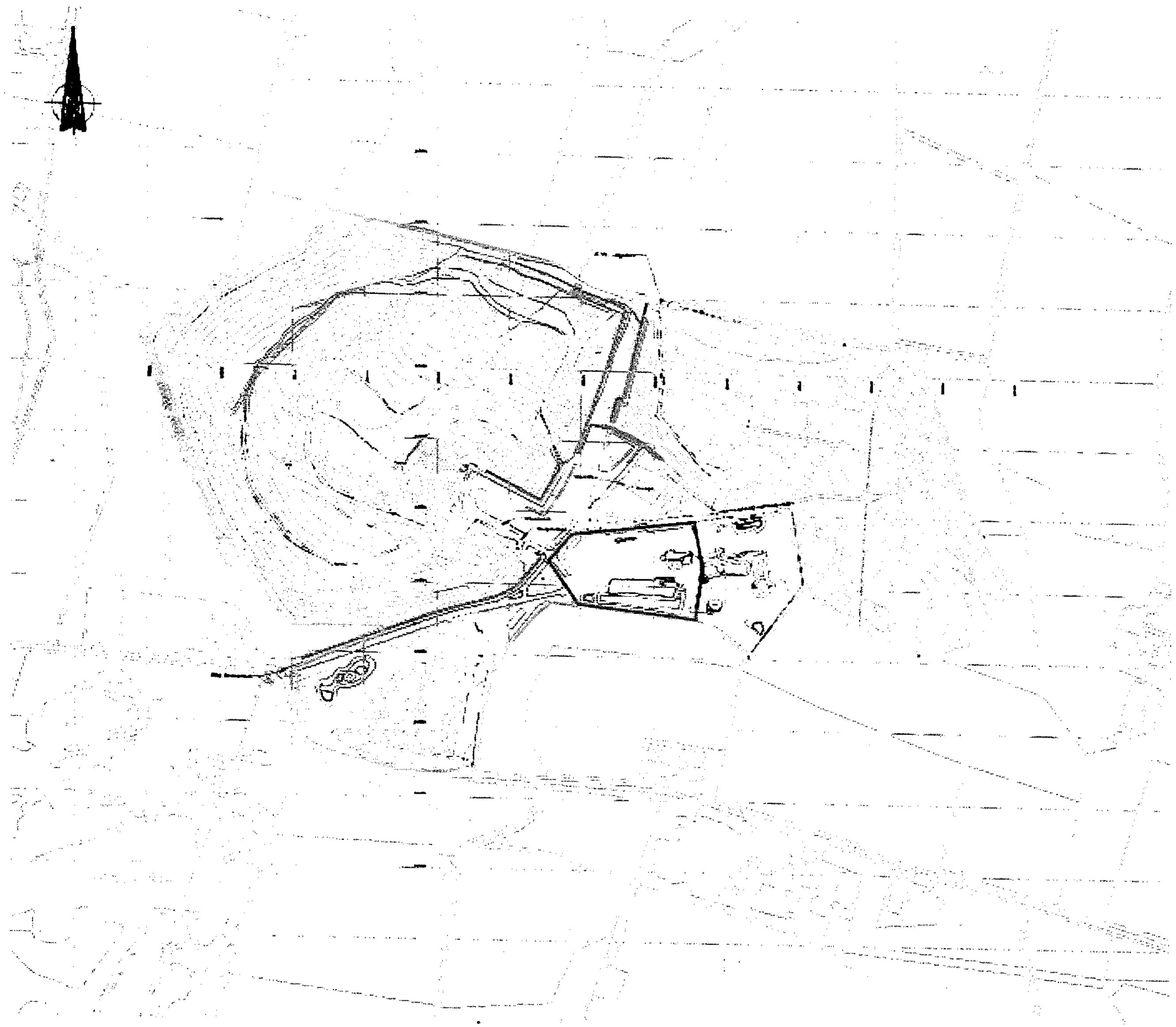
'stabilisation' means processes which change the hazardousness of the constituents in the waste and transform hazardous waste into non-hazardous waste;

'solidification' means processes which only change the physical state of the waste by using additives without changing the chemical properties of the waste;

'partly stabilised wastes' means wastes containing, after the stabilisation process, hazardous constituents which have not been changed completely into non-hazardous constituents and could be released into the environment in the short, middle or long term.

Schedule 7 – Site plan





NOTE

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

LEGEND

PERMIT BOUNDARY

AREA OF PROPOSED ACTIVITY

FOR INFORMATION

S2

FCC Environment

DANESHILL
SOILS TREATMENT
FACILITY

SITE BOUNDARY PLAN

KB	EJD	KB	KB
17.12.2019	1:5000	3982	P1

3982-CAU-XX-XX-DR-V-1804

Caulmert

engineering environment planning

Permit number
EPR/NP3538MF

Environment Agency's Decision Notice

Environment Agency

The Company Director and/or Secretary **Date: 09/12/2022**
3 Sidings Court
White Rose Way
Doncaster
England
DN4 5NU

Dear Sir/Madam

Your permit variation is complete

Permit reference: EPR/NP3538MF/V009
Operator: FCC Recycling (UK) Limited
Facility: Daneshill Landfill Site, Daneshill Road, Lound, Nottinghamshire, DN22 8RB

Our determination of your application to vary your permit is complete. We're satisfied that you can continue to carry out your activities in accordance with the variation, without harm to the environment or human health. I enclose a notice showing the changes to your permit. Please keep this in a safe place with your other permit records.

This letter contains web links to other documents. If you aren't able to access these phone our Customer Contact Centre for help on 03708 506 506.

If you're not familiar with our guidance on how to comply with your permit please look at the following guides:

www.gov.uk/guidance/develop-a-management-system-environmental-permits

www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

www.gov.uk/guidance/legal-operator-and-competence-requirements-environmental-permits

Please look at the table below and note any of the information or actions that apply to your permit.

If...	**then..**
the variation means you're now carrying out a waste operation or activity and need to submit quarterly waste returns on waste movements **Note:** This does not apply to permits that only have stand alone water discharge or groundwater activities.	you can get the forms you need from our website https://www.gov.uk/government/collections/national-operator-waste-returns When you complete your return use the waste returns reference above.
you need to submit other returns	send these to your area office. Speak to your area officer to check local arrangements.
your variation has added an installation to your permit for the first time	we've enclosed the pollution inventory letter, notice and fact sheet.

Rights of appeal

If you're not happy with any permit condition that has been imposed by the variation you may appeal to the Secretary of State. If you want to appeal any condition imposed as a result of your application you must make your appeal no later than six months from the date of the

variation notice. If you want to appeal any condition we've added as an Environment Agency initiated variation you must make your appeal no later than two months from the date of the notice.

Further information on making an appeal and the forms you will need are available from the Planning Inspectorate website.

You will need to provide the documents listed below to the Secretary of State at the Planning Inspectorate.

The documents are:

- a statement of the grounds of appeal
- a copy of any relevant application
- a copy of any relevant environmental permit
- a copy of any relevant correspondence between the appellant and the regulator
- a copy of any decision or notice which is the subject matter of the appeal and
- a statement indicating whether you wish the appeal to be in the form of a hearing or dealt with by way of written representations.

At the same time you must send us a copy of the notice and documents to;

Appeals Co-ordinator – Appeals, Environment Agency, National Permitting Service, Knutsford Road, Latchford, Warrington, WA4 1HT.

Telephone: 02 03 02 50662
Email: NPSCentralisedServicesTeam@environment-agency.gov.uk

You may withdraw an appeal by writing to the Secretary of State and sending a copy of that notification to us.

Please phone our Customer Contact Centre on 03708 506 506 if you have any questions about the enclosed permit, the information in this letter or have trouble following any of the web links to supporting documents.

To report a suspected waste crime, please call CrimeStoppers on 0800 555 111, or visit: https://www.gov.uk/report-an-environmental-incident

The National Permitting Service is committed to improving its customer service. By completing our customer satisfaction survey you can tell us what we are doing right and what we could do better. The survey should take no more than 10 minutes to complete and you can do so by clicking NPS Survey.

Yours sincerely,

Laura Auret
Permitting Support Advisor

Permitting Decisions- Variation

We have decided to grant the variation for Daneshill Landfill operated by FCC Recycling (UK) Limited.

The variation number is EPR/NP3538MF/V009.

Purpose of this document

This decision document provides a record of the decision-making process. It

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- summarises the engagement carried out because this is a site of high public interest
- shows how we have considered the consultation responses

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

In reaching our decision, we consider we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Description of activities

The variation is for a soil treatment facility (STF) located within the existing permitted landfill boundary situated at Daneshill Landfill, Lound, Nottinghamshire, DN22 8RB.

The STF will accept and treat up to 29,999 tonnes per annum of hazardous waste and 20,001 tonnes of non-hazardous waste by bioremediation. Once treated the wastes will be tested for suitability for use in the wider landfill restoration.

All storage and treatment operations will take place on impermeable pads with sealed drainage.

The bioremediation process exploits the ability of natural soil microbial populations such as bacteria and fungi to biodegrade organic pollutants such as petroleum hydrocarbons, polycyclic aromatic hydrocarbons, creosote, chlorinated solvents, Phenols and other volatile organic compounds (VOCs) into less harmful substances such as carbon dioxide and water vapour.

The site will only accept waste for treatment that can be treated to a point where they can be used in the final restoration of the landfill. Most wastes subject to bioremediation will be hazardous however where necessary to meet reuse thresholds non-hazardous soils similar to the mirror hazardous wastes will also be treated separately by bioremediation.

Once accepted at the site, the contaminated soils will be transferred to the treatment area and arranged into bio-piles approximately 4m high over perforated aeration pipes. The treatment surface consists of a geosynthetic clay lined pad with sand, crushed concrete and drainage infrastructure which drains to a collection pit before pumping to the on-site water treatment system.

Based on the contaminants present within the soil, nutrients such as ammoniacal nitrate and organic material such as woodchip are added to facilitate biodegradation. Optimum conditions will be created by controlling these nutrient levels along with parameters such as oxygen level, moisture content, pH levels and temperature.

The soils are arranged into bio-piles using a system of batches which allows the waste to be tracked by age from the point of origin to its location on the treatment pad. Soils are treated over an 8-16 week period depending upon the contaminants present. During this time the material will be turned every 4-8 weeks to facilitate aeration and reintroduce moisture as necessary.

The bioremediation process includes controls on gaseous and aqueous emissions (see key issues section for more information)

Screening

Mechanical screening of non-hazardous treated soils from the bioremediation area will be undertaken using a two way screen to meet the physical criteria for restoration soils. There will be no screening of hydrocarbon contaminated soils prior to bioremediation.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Key issues of the decision

Waste pre-acceptance and acceptance

The operator has confirmed that their waste pre-acceptance and acceptance procedures comply with BAT requirements as detailed in BAT 2 (Best Available Techniques BAT Conclusions for waste treatment Aug 2018). Following an initial enquiry from a customer the sites Technical Manager will carry out a full technical assessment which will include:

- The source and origin of the waste.
- Information on the process producing the waste
- The appearance if the waste
- Data on its composition and levels of contamination.

A set of terms and conditions for acceptance are sent to the waste producer including a statement of waste characterisation samples considered unsuitable for treatment including:

- Maximum contaminant concentrations for reuse in the restoration area or disposal within the landfill.
- Limitations on physical and chemical characteristics (particle size, pH, moisture.
- Statement from the producer confirming the soils are fee of tars, oils spills above treatability threshold, invasive species and high moisture content.

Once accepted the waste will be allocated a tipping reference and waste booked for acceptance. All vehicles bringing waste will pass over the weighbridge where the paperwork for each load will be inspected. Drivers will then be directed to the appropriate treatment pad.

The waste is visually inspected during unloading and if approved soils will be moved into stockpiles for reception sampling in line with BS812 – Testing Aggregates Part 1: Methods of Determination of Particle Size and Shape, at a frequency of at least one job (less than $50m^3$). Assessment will also confirm the waste contains biologically treatable substances with the range for contaminants based on pre-acceptance information. All analysis will be undertaken by an accredited United Kingdom Accreditation Scheme (UKAS) or a Monitoring Certification Scheme (MCERTS) accredited laboratory.

If insufficient information is provided to adequately characterise the waste to determine its suitability for treatment the operator will undertake pre-acceptance testing at the source site to establish an initial waste description.

No waste will be accepted unless it has been pre booked with the site manager details providing the source and approval number which is designated at the pre-acceptance stage. Waste will be weighed and assigned a tipping reference before deposit into the quarantine area.

Any non-confirming waste will be rejected.

Soils designated for bioremediation will be arranged into bio-piles using a system of batches which allow the waste to be trackable by age of waste and from the point of origin to its location on the treatment pad.

Wastes will be tested post treatment. Any non-conforming wastes will be transferred back for further treatment or disposed of.

Control of emissions from the bioremediation

The bio-piles have several operational controls which allow the control of gaseous and aqueous emissions:

Surface water management

The treatment pads are bunded and gravity drained to keep the process water separate from uncontaminated surface water runoff from non-waste handling areas of the site. Process water will collect in downgradient sumps and transferred to the on-site water treatment system.

The system comprises:

- A 50m^3 settlement tank with transfer pump and level detectors.
- Oil water separator/settlement tank with transfer pump and level detectors.
- Sand filter.
- Granulated activated carbon filter.

Water is transferred to the treatment system using a pump with integral level detection sensors from the collection sumps to the water storage tanks. The pumping system controls all the transfer pumps and level sensors protect from overfilling. The whole water treatment system is bunded which also provides over pumping protection. Pipework connecting the pumping chamber to the primary collection tank will be HDPE pipework connected by butt fusion. The pipework will be commissioned and pressure tested prior to operation to ensure that no leaks are present.

Effluent from the treatment system will be stored within a tank prior to testing and reuse within the treatment process or removed from site. There are no discharges of process waters on site.

Surface waters arising from the non-operational areas of the site flow towards the existing "SW lagoon" close to the site entrance which then discharges to the ditch on the western perimeter of the landfill which is monitored under the permit at SW04 and is an authorised discharge point for the site.

Air emissions

Abatement of air emissions will consist of an air extraction system which will draw air through the bio-piles and on to a biofilter before being discharged to atmosphere.

The air extraction system consists of a network of perforated pipes to distribute air flow. They will be installed beneath the bio-piles and will be linked by a main collection system to a vacuum blower. An air/water separator is fitted within the collection system to remove liquid from the process air extracted from the bio-pile. The process water is pumped from the separators via an automated pump with level detection system to the treatment system described above. The air fraction is then pumped through a treatment module and exhausted via the biofilter.

The biofilter is comprised of compost European Waste Catalogue (EWC) 19 05 03 Off Specification Compost produced at the operator's composting facilities. The material is hydrated and ammonium nitrate is added to increase the available nitrogen to approximately 100mg/kg to ensure that the medium is supportive of microbial proliferation once there are effluent gases passing through the biofilter. It will then be sampled to ensure operational parameters are within optimal range and covered with a tarpaulin to retain its moisture content and reduce the potential for any particulate and odour emissions.

The filter's function is to treat exhaust gases, removing Volatile Organic Compounds (VOC's), Total Petroleum Hydrocarbons (TPHs), Polycyclic Aromatic Hydrocarbons (PAHs), and BTEX (benzene, toluene, ethylbenzene and xylene) via microbial action.

In order to maintain a moisture film on the matrix of the biofilter, recirculating process water may be pumped periodically onto the surface. Process monitoring of the biofilter is required within the permit to ensure the optimum conditions for operations are maintained.

We have included an Improvement Condition 11 within the permit requiring the operator to carry out a review of the waste filter media using emissions data collected within the first year of operations to demonstrate the filter is effective.

Fugitive emissions of dust

There is the potential for the STF to produce dust. The operator has submitted an Emissions Management Plan. The plan identifies potential sources of dust, sensitive receptors and considers pathways for impact.

The operator has identified the following operations likely to generate the greatest potential for impact. These include:

- Waste delivery and reception
- Haulage routes within the site
- Deposition into treatment areas
- Bioremediation including initial placement and turning
- Post treatment screening
- Storage and transfer of oversize materials

Soil movements will be kept to a minimum. Once soils are formed into bio-piles the sides are sealed with an excavator bucket with turning undertaken every 3-4 weeks for decompaction reasons. The bio-piles can also be irrigated should surface dust be observed.

In addition to this the operator has committed to operating techniques including good housekeeping and cleaning procedures to ensure the potential for dust generation is kept to a minimum. The following measures are proposed:

- Vehicles delivering to site will be covered
- On site speed limit
- Bowsers and spray rails as used in the adjacent landfill for damping down haulage routes
- Reduced drop heights
- All vehicles will use the on-site wheel wash
- Road sweeping undertaken
- Dust suppression system in place using mains water only.

We agree that these measures constitute BAT for the facility.

Odour and Air Quality Impact Assessment

Soils accepted for treatment can potentially contain odorous organic substances due to the presence of hydrocarbons. The operator has submitted an odour management plan with their application. A separate air quality impact assessment was also submitted to consider the air quality impacts on human health from VOC's.

The operator has identified the following activities as potential odour sources:

- Soil delivery and initial waste acceptance.
- Bioremediation including bio-pile formation, aeration and turning.
- Emissions from biofilter and treatment of surface waters.
- Screening and handpicking of soils.
- Storage and transfer of residual material removed from the screening process.

The management of the bio-piles and maintenance of optimum temperature, oxygen, moisture, and pH is essential for the minimisation of odour potential. These parameters are monitored and amended as detailed elsewhere.
The operator has set out the following measures to prevent emissions:

- Waste acceptance procedures – no waste will be accepted at site unless it has been pre-booked and details of source, physical and chemical composition and hazardous status have been provided.
- Onsite inspection procedures ensuring malodourous wastes are rejected or accepted only if arrangements are in place to treat the waste in a way that will minimise odours.
- Drop heights will be reduced during loading and unloading to minimise agitation of waste.
- Soils can be covered with tarpaulin, woodchip or non-odorous soils if required.
- Soils are formed on an air extraction system that draws vapours through the biofilter. This maintains a vacuum under the stockpiled soils drawing air towards the biofilter. Biofilter flow rates can be adjusted to increase the retention time if there is odour potential at the biofilter during soil turnover.
- Soil decompaction results in the opening of 3m wide sections of the bio-pile at any one time that will be sealed at the end of each working day.
- Soil screening will only be undertaken on soils which have been characterised to ensure no odour is present and will only be undertaken on soils post bioremediation if necessary to meet soil reuse criteria.

We consider these measures constitute BAT for the installation.

Air Quality Assessment
The use of a bio-filter is considered a Best Available Technique. The operator however proposes to use the waste materials EWC 19 05 03 Off specification compost derived from their composting facilities as a filter medium. We have therefore considered the operator's Air Quality Assessment which was submitted in support of the use of waste material.

The operator submitted an Air Quality Assessment which considers the air quality impacts from the facility on human health. The main pollutants of concern are Benzene, Toluene, Ethylbenzene and Xylene. The assessment is based on the assumption that the contaminants in the soils will be similar in character to those tested at a similar site for which 18 months of monitoring data has been supplied.

The operator modelled their emissions using ADMS 5.2 to predict how emissions will be dispersed.

The modelling confirmed impacts from Benzene, Toluene, Xylene and Ethylbenzene are low risk when comparing modelled PCs against environmental standards.

Noise and vibration

Noise pollution beyond the site boundary is considered unlikely due to the distance to nearby receptors. The operator however has confirmed the following mitigation measures associated with operations on site:

- Maintenance of mobile plant/machinery and equipment fitted with silencers and acoustic hoods
- Vacuum extraction blowers and pumps are housed in acoustic enclosures
- Avoid unnecessary revving and idling of engines
- Use of broadband type noise reversing alarms (not beepers)
- Minimise drop heights.

Storage, containment and drainage

All storage and treatment operations are undertaken on three specially constructed pads with impermeable surfacing and drainage with waters pumped to holding tanks prior to treatment.

Asbestos Waste

We have refused the proposal outlined in the application to accept and treat soils containing asbestos under EWC 17 06 05*. As the facility is an installation under the Environmental permitting (England and Wales) Regulations 2010 we must exercise our functions to achieve a high level of protection for the environment taken as a whole, by in particular preventing or where that is not practicable reducing emissions into air, water and land. We also need to ensure compliance with Article 11 of the Industrial Emissions Directive 2010/75/EU (IED) which requires the use of Best Available Techniques to reduce emissions and the impact on the environment as a whole.

The operator proposed that only soils containing bound asbestos would be accepted for treatment. They state that bound material is considered in a cement matrix consisting of visible fragments. The operator also proposed the following operating techniques for the waste stream:

- Segregated storage and processing area for asbestos contaminated soils.
- Stockpiles covered with tarpaulins.
- Asbestos contaminated soils to be screened using a three-way screener. The screener and conveyers of the screener will be covered and linked to a HEPA filter. Monitoring to be undertaken at the filter.
- Post screening soils to travel along an input conveyer with spray rail to a covered picking station, visible fragments of asbestos to be hand-picked and placed in polythene bags prior to deposit within locked skips.
- Dust suppression to be in place to dampen stockpiles and during loading and unloading activities.

The purpose of soil treatment is to enable reuse of soil for the restoration of the wider landfill site. The picked asbestos pieces would be sent to hazardous landfill for disposal.

Annex II of IED lists asbestos (suspended particulate, fibres) as a polluting substance to air. We consider that the proposed operation poses a risk of generating airborne fibrous asbestos fibres. Asbestos from fibrous or damaged/broken bonded asbestos can easily become airborne during handling and treatment. The inhalation of asbestos fibres can cause serious illness and significant harm to human health including malignant lung cancer. Any release of fibres would create a risk to human health as there is no safe lower limit. Therefore, having regard to the nature of the potential emissions and the need to prevent them to ensure the waste management of asbestos is carried out without endangering human health or without harming the environment, it is essential that the handling of waste containing asbestos is kept to a minimum to avoid the risk of release of asbestos.

Where waste soil is treated in fixed plant, Best Available Techniques (BAT) applies as described in the Waste Treatment BATC 2018. Relevant appropriate measures should be used as identified in Sector Guidance EPR S5.06 "Guidance for the Recovery of Hazardous and Non-Hazardous Waste S5.06 and supplemented by document "Hazardous Waste Soil Treatment".

In accordance with the Industrial Emissions Directive, BAT is to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it. We do not consider that the proposed operating techniques for the storage, handling and treatment of asbestos waste represent BAT. We consider that the storage, handling and treatment of asbestos wastes in the manner proposed increase the risk of airborne fibres being released into the environment. The proposed method of treatment is not considered to be acceptable and the operator has not provided justification that there are benefits from the proposed treatment which would outweigh the risks.

We consider that the screening process proposed by the operator is likely to agitate the waste and result in the generation of asbestos fibres. The operator has provided details of a covered three-way screen linked to HEPA filter in which treatment will be undertaken. This however will eject soils potentially with a higher fibre content than when they were received on site.

The soils would then be subject to hand picking for asbestos fragments within a mobile picking station. Spray rails for damping down would be used on the input conveyers for dust suppression.

Annex II of IED lists asbestos (suspended particles, fibres) as a polluting substance to air. We consider that the proposed operation poses a risk of generating airborne asbestos fibres. Degraded and damaged waste will be friable and will pose a risk of releasing asbestos fibres. This will be further compounded by handling and treatment.

We consider the mechanical screening process proposed by the operator is likely to agitate the waste and result in the generation of asbestos fibres. Such fibres from damaged/broken bonded asbestos can easily become airborne during treatment. The screening of such waste will break the asbestos pieces and release fibres. The inhalation of asbestos fibres can cause serious illness and significant harm to human health including malignant lung cancer. Any increase and/or agitation of fibres would create a risk to human health as there is no safe lower limit. Therefore, having regard to the nature of the potential emissions and the need to prevent them to ensure the waste management of asbestos is carried out without endangering human health of without harming the environment, it is essential the handling of waste containing asbestos is kept to a minimum to avoid the risk of any release of asbestos.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

We consulted the local authority.

No response was received.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Director of Public Health and Public Health England
- Health and Safety Executive

The comments and our responses are summarised in the consultation responses section.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1'

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

The site

The operator has provided a plan which we consider to be satisfactory.

These show the extent of the site of the facility [including the emission points].

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports.

The facility lies within the boundary of the existing landfill. The operator however provided a description of the site.

The area of the STW was previously used as a munitions factory which was decommissioned in the 1970s. No landfilling of waste activities has been carried out. The concrete surfacing has fallen into disrepair with many cracks and breaks. The working areas and impermeable surfacing will be developed prior to the operation of the STF.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

Mattersley Hill Marsh SSSI lies 500m to the North West of the STF.

A number of Local Wildlife Sites also lie within the statutory screening distance. The nearest being Daneshill Lakes and Woodland 400m to the west.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permits.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and
- the environmental risk assessment is acceptable.

We have excluded the following wastes for the following reasons:

- 19 12 11* - soil from metal recycling facilities contaminated with hydrocarbons.

  The operator was unable to explain from where or what treatment operation soils arose from a metal recycling facility. We have concerns that the waste may not just be soil and may contain more contamination than just hydrocarbons.

We have restricted the following wastes for the following reasons

- 19 02 05* sludges from the physico/chemical treatment of road sweepings (soil wastes only) containing hazardous substances.

Management system

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Technical competence

Technical competence is required for activities permitted.

The operator is a member of the CIWM/WAMITAB scheme.

Andrew Clee holds technical competency for treatment of hazardous waste and appropriate continuing competence.

We are satisfied that the operator is technically competent.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says:

"The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Consultation Responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public, and the way in which we have considered these in the determination process.

Decisions about land use are matters for the land-use planning system. The location of the facility is a relevant consideration for environmental permitting but only with regard to its potential to have an adverse environmental impact on members of the public or sensitive environmental receptors. The impact on members of the public and the environment had been assessed as part of the determination process and is detailed in this document.

Responses from organisations listed in the consultation section

Response received from the Director of Public Health Bassetlaw District Council.

Brief summary of issues raised: Highlighted Best Available Technique 14 (BAT 14) of the Waste Treatment BAT Conclusions issued 2018 requiring operators to prevent or where not practicable contain, collect and treat diffuse emissions. Suggesting the construction of a structure around the works would prevent fugitive emissions.

Summary of actions taken: We have carried out an assessment of the impact as detailed in the key issues section and this confirms we have significant concerns with regards to diffuse emissions. BAT14 is fundamental to our decision whether to issue or refuse a permit. In this instance we agree that the operator has not adequately demonstrated BAT 14 can be achieved in respect to asbestos handling and treatment.

Response received from the Health and Safety Executive.

Brief summary of issues raised: No comments

Summary of actions taken: -

Representations from local MPs, assembly members, councillors and parish/town community councils

Response received from Brendan Clarke-Smith MP.

Brief summary of issues raised: Consulted with constituents and Parish Councils. Granting a permit would be unsuitable. Proposal would be detrimental to the local population and sensitivity of the site and pose a persistent danger.

Summary of actions taken: -

Representations from individual members of the public

Representations have been grouped with similar comments and a response provided in italics.

Site located too close to nature reserves and villages. Site activities may diminish the amenity value of these areas and pose a threat to wildlife.

The location of the STF is a consideration under the Planning Process however potential impacts upon Daneshill Lakes LWS and Mattersley Hill Marsh SSSI and nearby residential receptors have been assessed as part of the application assessment. We have however assessed all relevant ecological sites and emissions control measures and concluded that the installation would not adversely affect the integrity of those sites.

Concerns regarding the transport of hazardous waste through local villages. Increase in vehicle movements to the site with local roads being unsuitable for heavy vehicles. The road to the site is small and winding with a dangerous crossroads.

Vehicle movements outside of the site boundary fall outside the Environment Agencies remit and are a Planning issue.

It however should be noted the soils bought to site for remediation are replacing soils which would need to be imported to complete the landfill restoration.

Site overlies a principle aquifer. Activities may pose a threat to drinking water in the area. Risk of contaminants entering the food chain.

We have carried out an assessment of impacts to ground and groundwater as part of the application. We consider activities will not lead to contamination. See key issues section for full details.

Concerns with regards to the activities being undertaken outdoors. That there are limited safeguards in place with some soils sheeted while others are not. Questions whether sheeting will provide an acceptable barrier.

Inadequate risk assessments contained within the application. Asbestos cement is subject to weathering and may become friable. Asbestos cement may contain other forms of asbestos other than chrysotile. Sorting outside may lead to fibre release. Use of a building with filtration may be more appropriate.

Transporting, snapping, rubbing will release asbestos fibres.

Wind blows from the west towards Lound Village. Particles may be transported in the air.

No safe level of asbestos 0.01% of chrysotile and 0.01% of other forms is not safe. Concerns with the hazardous nature of asbestos and that there is no safe level of exposure.

Application lacking specific detail with regards to asbestos handling and wrapping. Lack of detail with regards to risk on highway of spillages etc.

Safe operation relies on human judgement. Errors may occur. Relying on human judgement is a high risk option. Without additional measures in place there is too much risk of human error.

The applicant was asked to provide further information on their operating techniques and we have carried out an assessment of the risks of outdoor storage and treatment operations and agree the risks of asbestos fibre release from movement and agitation of the waste is significant. We agree the application lacks detail, the working methods proposed are basic and akin to site remediation activities designed to meet the needs of individual contaminated sites for which works last a short period of time and the risks assessed against the needs of the site on a case by case basis. Installations must adhere to appropriate measures and BAT as detailed previously which in the instance of asbestos activities have not been met.

Operator competence. Historic concerns raised regarding the operation of the Daneshill landfill. Reports of HGV pollution and debris deposited on roads. Previous concerns with HGVs accessing the site without sheeting. Allegations the landfill has a poor compliance history with Nottingham County Council enforcement teams visiting the site.

FCC having poor compliance at other sites including fines from the Health and Safety Executive and enforcement notices for failure to carry out risk assessments.

Allegations the surrounding ditches of the site are contaminated with demolition waste. Footpaths around the site are littered with debris

Off-site vehicle impacts are outside the scope of the permitting process. No significant history of non-compliance regarding the operation of the landfill has

been recorded by the Environment Agency. Standard permit conditions will ensure the EA has the ability to check compliance of the site.

Site area was a previous munitions factory with suspected contamination from associated chemicals. Activities have the potential to expose historic munitions or react with existing chemicals.

The applicant provided a site condition report describing the area proposed for the STF, see above sections of the Decision Document.

Concerns FCC will not be the operator of the facility with Provectus managing the site.

We are satisfied FCC will have control over operations on site. It is acceptable that the operator hires a contractor to carry out activities on site on their behalf.

Site marked for closure December 2023. The STF application reneges on these responsibilities keeping the site open and exposes the community to further disruption from heavy industry, the site having been in place for several decades.

Land use is a planning issue.

Results of asbestos and biofilter monitoring at Edwin Richards Quarry, Rowley Regis is misleading and inappropriate for the situation at Daneshill where activities are undertaken outside.

We consider the biofilter emissions monitoring appropriate as representative emissions data. The site will accept the same range of wastes for treatment within a similar process with external biopiles and bio filter. It is accepted that sites accepting similar wastes in similar quantities will have similar emissions.

We have included conditions within the permit requiring emissions monitoring and improvement conditions requiring the operator to monitor the biofilter to ensure the filter is working efficiently.

Insufficient waste acceptance procedures. Independent analysis of the waste should be undertaken.

Concerns regarding the acceptance of liquid type wastes – drilling muds and oil spills and questions regarding how contaminants such as NORM, BTEX and H2S are tested for.

Liaison Group should be formed between FCC and community groups – complaints procedure.

Concerns with the reuse of contaminated soils for capping material on the landfill

The purpose of the STF is to remediate soils so they are suitable for reuse at the landfill. Prior to reuse soils will be subject to acceptance testing. The treated soils must also fulfil the criteria specified within the restoration plan for the landfill.

Monthly Hydrogen Sulphide monitoring required at the landfill site boundary.

Concerns with the operating hours requested.

Not within the Environment Agency's remit.

Variation Application Documents

Application Forms
Parts A, C2, C3, F

Application for an environmental permit
Part A – About you

Environment Agency

You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

You can apply online for Waste standard rules environmental permits, bespoke waste permits and bespoke Medium combustion plant permits

Apply online for an environmental permit.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

Note: if you believe including information on a public register would not be in the interests of national security you must enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual	☐ Now go to section 2 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
An organisation of individuals (for example, a partnership)	☐ Now go to section 3 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
A public body	☐ Now go to section 4
A registered company or other corporate body	☑ Now go to section 5 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Now go to section 6

3 Applications from an organisation of individuals or charity

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation or charity

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to question 3c or section 6

3c Details of charity

Full name of charity

This should be the full name of the legal entity not any trading name.

3d Company registration number

If you are registered with Companies House please tell us your registration number

3e Charity Commission number

If you are registered with the Charity Commission please tell us your registration number

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

FCC Recycling (UK) Limited

5b Company registration number

02674166

Date of registration (DD/MM/YYYY)

24/12/1991

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

5 Applications from companies or corporate bodies, continued

5c Please give details of the directors

If relevant, provide details of other directors and company secretary, if there is one, on a separate sheet and tell us the reference you have given this sheet.

Document reference	See Supporting Document 3982-CAU-XX-XX-RP-V-0300
Details of company secretary (if relevant) and director/s	
Title (Mr, Mrs, Miss and so on)	
First name	
Last name	
Title (Mr, Mrs, Miss and so on)	
First name	
Last name	

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name	
Title (Mr, Mrs, Miss and so on)	Mr
First name	Vicente
Last name	Orts-Llopis
Address	FCC Recycling (UK) Limited 900 Pavilion Drive Northampton Business Park NN4 7RG
Postcode	
Contact numbers, including the area code	
Phone	[redacted]
Fax	
Mobile	[redacted]
Email	

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference	[redacted]

6b Main UK business address (if different from above)

Contact name	
Title (Mr, Mrs, Miss and so on)	Mr
First name	James
Last name	Cook
Address	FCC Recycling (UK) Limited 3 Sidings Court Doncaster
Postcode	DN4 5NU

6 Your address, continued

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

It will help us if there is someone we can contact if we have any questions about your application. The person you name should have the authority to act on your behalf.

Please add a second contact on a separate sheet if this person is not always available.

Document reference of this separate sheet

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on) Mr

First name Andy

Last name Stocks

Address Caulmert Limited
14 Farrington Way
Eastwood Link Business Park
Eastwood, Nottingham

Postcode NG16 3BF

Contact numbers, including the area code

Phone [redacted]

Fax

Mobile [redacted]

Email [redacted]

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on)

First name as Per 6b

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7 Contact details, continued

7c Who can we contact about your billing or invoice?

Note: Please provide the name and address that all invoices should be sent to for your subsistence fees.

As in question 7a ☐

As in question 7b ☑

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it. More information on how to do this is available at: www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application

For how many copies to send see the guidance note on part A.

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

For flood risk activity permits send 1 copy only to enquiries@environment-agency.gov.uk or to the local Environment Agency office for where the work is proposed to be carried out.

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Appendix 1 – Date of birth information for installation and waste activities (applications for a new permit or transferring a permit) only

Date of birth information in this appendix will not be put onto our Public Register

Are you applying as an individual, an organisation of individuals (for example, a partnership) or a company (this includes Limited Liability Partnerships)?

An individual	☐ Now go to 2
An organisation of individuals (for example, a partnership)	☐ Now go to 3
A registered company or other corporate body	☑ Now go to 4

2 Applications from an individual

Please give us the following details

Name

Date of birth (DD/MM/YY)

3 Applications from an organisation of individuals or charity

Details of the organisation or charity

If you are an organisation of individuals, please give the date of birth details of the main representative below. If relevant, provide details of other members on a separate sheet and tell us the document reference you have given this sheet.

Name

Date of birth (DD/MM/YY)

Document reference

4 Applications from companies or corporate bodies

Name of the company See Supporting Document

Please give the date of birth details for all directors and company secretary if there is one. If relevant, provide those details of other directors on a separate sheet and tell us the document reference you have given this sheet.

Details of company secretary (if relevant) and director/s

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Document reference

Application for an environmental permit
Part C2 – General – varying a bespoke permit

Environment Agency

Fill in this part of the form, together with part A and the relevant parts of C3 to C7 and part F1 or F2, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or changing existing ones).

Waste operation changing to installation or vice versa?

If your changes mean that a waste operation becomes an installation (or vice versa) you also need to fill in either part C3 (waste to installation) or part C4 (installation to waste).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 About the permit

Note: If you are applying to convert your existing permit to a standard permit or add a standard facility you need to fill out form C1.

1a Discussions before your application

If you have had discussions with us before your application, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet.

Permit or document reference: EA/EPR/NP3538MF/V008

1b Permit number

What is the permit number that this application relates to? EPR/NP3538MF

1c Site details

What is the name, address and postcode of the site?

Site name: Daneshill Landfill Site

Address: Daneshill Road
Lound
Nottinghamshire

Postcode: DN22 8RB

2 About your proposed changes

2a Type of variation

What type of variation are you applying for?

Minor technical ☐
Normal variation ☐
Substantial ☑

2 About your proposed changes, continued

2b Changes or additions to existing activities

Please give us brief details in the box below. More detailed information can be given in Table 1 below.

See Supporting Document 3982-CAU-XX-XX-RP-V-0300-A0-C1

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Fill in a separate table for each activity you are applying to vary or add. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given this document.

Document reference: See Supporting Document

You only need to fill in one table for your mining waste operations.

2c Consolidating (combining) or updating existing permits

If your proposed change is to modernise (update) your permit, now answer 2c1; otherwise go to 2d.

If your proposed change is to consolidate (combine) a number of permits, now answer 2c2; otherwise go to 2d.

Note: In both cases we may require additional information from you about, for example, your management system. Therefore we would always advise you to talk to us before you submit any application to modernise or consolidate permits.

2c1 Do you want to have a modern style permit?

No ☑

Yes ☐

2c2 Identify all the permits you want to consolidate (combine) by listing the permit numbers in Table 2 below

Table 2 – Permit numbers

2d Treating batteries

2d Are you proposing to treat batteries?

No ☑

Yes ☐ Tell us how you will do this and send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2e Ship recycling

2e1 Is your activity covered by the Ship Recycling Regulations 2015? (See the guidance notes on part C2.)

No ☑

Yes ☐ Tell us how you will do this. Please send us a copy of your explanation and your facility recycling plan, and tell us below the reference numbers you have given these documents

Document reference for the explanation

Document reference for the facility recycling plan

2e2 Is this a renewal of an existing authorisation covered by the Ship Recycling Regulations 2015?

No ☑

Yes ☐ Tell us the expiry date of your existing authorisation (DD/MM/YYYY)

2 About your proposed changes, continued

Table 1 – Changes to existing activities

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity	Proposed changes document reference
i.e. name of installation, waste operation, mining waste operation, water discharge activity or groundwater activity							
Example – effluent unique name					Example – treated sewage effluent		
If you do not have enough room, go to the line below or send a separate document and give us the document reference here							
See Supporting							
Document							

2 About your proposed changes, continued

2f Low impact installations (installations only)

2f1 Will any changes mean that any of the regulated facilities will become low impact installations?

No ☑ Now go to section 3

Yes ☐ If yes, tell us how you meet the conditions for a low impact installation (see the guidance notes on part C2 – Appendix 1)

Document reference

Tick the box to confirm you have filled in the low impact installation checklist in appendix 1 for each regulated facility ☐

3 Your ability as an operator

If you are applying to add waste installations or waste operations to a permit that has not previously had them, you need to fill in all of section 3.

If you are applying to consolidate (combine) two or more permits or have an updated permit you must fill in question 3d.

This section does not apply for applications to surrender a permit.

3a Relevant offences

Installations and waste operations only (see the guidance notes on part C2).

3a1 Have you, or any other relevant person, been convicted of any relevant offence?

No ☑ Now go to question 3b

Yes ☐ Please give details below

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position held at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Document reference

Now go to question 3b

Please also complete the details in Appendix 2.

3b Technical ability

Specified waste management activities and waste operations only (see the guidance notes on part C1).

Please indicate which of the two schemes you are using to demonstrate you are technically competent to operate your facility and the evidence you have enclosed to demonstrate this.

ESA/EU skills

I have enclosed a copy of the current Competence Management System certificate ☑

CIWM/WAMITAB scheme

Please select **one** of the following:

- I have enclosed a copy of:
  - the relevant qualification certificate/s ☐

  or
  - evidence of deemed competence ☑

  or

3 Your ability as an operator, continued

- Environment Agency assessment ☐

or

- evidence of nominated manager status under the transitional provisions for previously exempt activities ☐

and, if deemed competent or Agency-assessed, or if there is evidence of a nominated manager, or if the original qualification is over two years old:

I have enclosed a copy of the relevant current continuing competence certificate/s ☐

For each technically competent manager please give the following information. If necessary, use a separate sheet to give us these details and tell us below the document reference you have given the extra sheet.

Title (Mr, Mrs, Miss and so on)

First name See Supporting Document

Last name

Phone

Mobile

Email

Please provide the environmental permit number/s and site address for **all** other waste activities that the proposed technically competent manager provides technical competence for, including permits held by other operators. Continue on a separate sheet as required.

Permit number	Site address	Postcode

Document reference

Now go to question 3c

Please also complete the details in Appendix 2.

3c Finances

Installations, waste operations and mining waste operations only (see the guidance notes on part C2).

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

Do you or any relevant person or a company in which you were a relevant person have current or past bankruptcy or insolvency proceedings against you?

No ☑

Yes ☐ Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed

We may want to contact a credit reference agency for a report about your business's finances.

3 Your ability as an operator, continued

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

Renewable bonds ☐

Cash deposits with the Environment Agency ☐

Other – provide comprehensive details ☐

Document reference

Provide a cost profile and expenditure plan of your estimated costs throughout the aftercare period of your site.

Document plan reference N/A to this application

Now go to question 3d

3d Management systems

You must have an effective, written management system in place that identifies and reduces the risk of pollution. You may show this by using a certified scheme or your own system.

Your permit requires you (as the operator) to ensure that you manage and operate your activities in accordance with a written management system.

You need to be able to explain what happens at each site and which parts of the overall management system apply. For example, at some sites you may need to show you are carrying out additional measures to prevent pollution because they are nearer to sensitive locations than others.

You can find guidance on management systems on our website at www.gov.uk/government/organisations/environment-agency.

Tick this box to confirm that you have read the guidance and that your management system will meet our requirements ☐

What management system will you provide for your regulated facility?

ISO 14001 ☑

BS 8555 (Phases 1–5) ☐

Acorn ☐

Green dragon ☐

Own management system ☐

Please make sure you send us a summary of your management system with your application.

Document reference/s

4 Consultation

Fill in 4a to 4c for installations and waste operations and 4d for installations only.

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

No ☑

Yes ☐ Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

No ☑

Yes ☐ Please name the harbour authority

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

No ☑

Yes ☐ Please name the fisheries committee

4 Consultation, continued

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

No ☑

Yes ☐

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 2015, or a safety report is needed under regulation 7 of those Regulations?

No ☑

Yes ☐

5 Supporting information

5a Provide a plan or plans for the site

See the guidance notes on part C2 for what needs to be marked on the plan.

Clearly mark the site boundary or discharge point, or both. Also include site drainage plans, site layout plans, and plant design drawings/process flow diagrams (as required). (See the guidance notes on part C2.)

Document reference/s of the plans: N/A

5b Do any of the variations you plan to make need extra land to be included in the permit?

No ☑

Yes ☐ Please provide a site report for the extra land

Document report reference/s:

5c Provide a non-technical summary of your application

Document reference of the summary: Non-Technical Summary 3982-CAU-XX-XX-RP-V-0302

5d Risk of fire from sites storing combustible waste

Are you applying for an activity that includes the storage of combustible wastes?

(This applies to all activities excluding standalone water and groundwater discharges.)

No ☑ Go to question 5f

Yes ☐ Go to question 5e

5e Will your variation increase the risk of a fire occurring or increase the environmental risk if a fire occurs?

See the guidance notes on part C2.

No ☐

Yes ☐ Provide a fire prevention plan. You need to highlight any changes you have made since your pre-application discussions

Document reference of the plan:

5f Adding an installation

If you are applying to add an installation, tick the box to confirm that you have sent in a baseline report and provide a reference ☐

Document reference of the report:

6 Environmental risk assessment

If you need one, see the guidance notes on part C2.

Provide an assessment of any additional risks the proposed changes or additions to your regulated facilities poses to the environment as part of your application to vary this permit. The risk assessment must follow the methodology set out in 'Risk assessments for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit or an equivalent method.

Document reference for the assessment: See Amenity and Accidents RA 3982-CAU-XX-XX-RP-V-0303

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19110
Clarity approved by Plain English Campaign

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Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendix 1.

Appendix 1 – Low impact installation checklist

Installation reference				
Condition	Response			Do you meet this?
A – Management techniques	Provide references to show how your application meets A			Yes ☐ No ☐
	References			
B – Aqueous waste	Effluent created		m^3/day	Yes ☐ No ☐
C – Abatement systems	Provide references to show how your application meets C			Yes ☐ No ☐
	References			
D – Groundwater	Do you plan to release any hazardous substances or non-hazardous pollutants into the ground?		Yes ☐ No ☐	Yes ☐ No ☐
E – Producing waste	Hazardous waste		Tonnes per year	Yes ☐ No ☐
	Non-hazardous waste		Tonnes per year	
F – Using energy	Peak energy consumption		MW	Yes ☐ No ☐
G – Preventing accidents	Do you have appropriate measures to prevent spills and major releases of liquids? (See 'How to comply'.)		Yes ☐ No ☐	Yes ☐ No ☐
	Provide references to show how your application meets G			
	References			
H – Noise	Provide references to show how your application meets H			Yes ☐ No ☐
	References			
I – Emissions of polluting substances	Provide references to show how your application meets I			Yes ☐ No ☐
	References			
J – Odours	Provide references to show how your application meets J			Yes ☐ No ☐
	References			
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action as described in Compliance History Appendix 1 explanatory notes		Yes ☐ No ☐	

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

Date of birth information in this appendix will not be put onto our Public Register

Have you filled in the Relevant Offences question?

Yes ☑

No ☐

Have you filled in the Technical ability question?

Yes ☑

No ☐

2 Relevant Offences - date of birth information

Please give us the following details

Name: See Supporting Document

Date of birth (DD/MM/YY):

3 Technical ability - date of birth information

Name: See Supporting Document

Date of birth (DD/MM/YY):

Application for an environmental permit Part C3 – Variation to a bespoke installation permit

Environment Agency

Fill in this part of the form, together with part A, part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What activities are you applying to vary?

Fill in Table 1a below with details of all the activities listed in schedule 1 of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows), that you propose to carry out at the installation.

Note: if you want to add a Medium combustion plant or specified generator (MCP/SG) to your installation please use part C2.5 instead.

Fill in a separate table for each installation you are applying to vary. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference: Supporting Document 3982-CAU-XX-XX-RP-V-0300-A0-C1

1 What activities are you applying to vary?, continued

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 references (See note 1)	Description of the Activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
Add extra rows if you need them. If you do not have enough room, go to the line below or send a separate document and give us the document reference here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
See Activities & Operating						
Techniques Report						
Ref: 3982-CAU-XX-XX-RP-						
V-0305-A0-C1						

Directly associated activities (See note 4)		
Name of DAA	Description of the DAA (please identify the schedule 1 activity it serves)	
Add extra rows if you need them		
For installations that take waste (See note 5 below)	Total storage capacity	
	Annual throughput (tonnes each year)	

1 What activities are you applying to vary?, continued

Notes

1 Quote the section number, part A1 or A2 or B, then paragraph and sub paragraph number as shown in part 2 of schedule 1 to the regulations.

2 Use the description from schedule 1 of the regulations. Include any extra detail that you think would help to accurately describe what you want to do.

3 By 'capacity', we mean:

- the total incineration capacity (tonnes every hour) for waste incinerators
- the total landfill capacity (cubic metres) for landfills
- the total treatment capacity (tonnes each day) for waste treatment operations
- the total storage capacity (tonnes) for waste storage operations
- the processing and production capacity for manufacturing operations, or
- the thermal input capacity for combustion activities

4 Fill this in as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have DAAs as part of a mobile plant application.

5 By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those wastes you will accept on to the site for that activity. Give the List of Wastes catalogue code and description (search for 'Technical guidance on how to assess and classify waste' at www.gov.uk/government/organisations/environment-agency).

If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any waste with a code ending in 99, you must provide more information and a full description of the waste in the document, (for example, detailing the source, nature and composition of the waste). Where you only want to receive specific wastes within a waste code you can provide further details of the waste you want to receive. Where a waste is dual coded you should use both codes for the waste.

Document reference of this extra information: See Activities & Operating Techniques Report

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of the waste
Example	Example
02 01 08*	Agrochemical waste containing hazardous substances
18 01 03*	Infectious clinical waste, not contaminated with chemicals or medicines – human healthcare (may contain sharps) for alternative treatment
17 05 03*/17 06 05*	Non-hazardous soil from construction or demolition contaminated with fragments of asbestos cement sheet

2 Point source emissions to air, water and land

Fill in Table 2 below with details of the emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation.

Table 2 – Emissions

Installation name	Daneshill Soil Treatment Facility See Activities & Operating Techniques Report			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
See Activities & Operating Techniques Report				
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
See Activities & Operating Techniques Report				
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
See Activities & Operating Techniques Report				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
See Activities & Operating Techniques Report				

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each activity at the installation you refer to in Table 1a above and list the 'Best Available Techniques' you are planning to use. If you use the standards set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or technical guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.

You must justify your decisions in a separate document if:

- there is no technical standard
- the technical guidance provides a choice of standards, or
- you plan to use another standard

This justification could include a reference to the Environmental Risk Assessment provided in part C2 (general bespoke permit) of the application form.

For each of the activities listed in Table 1a, the documents in Table 3a should summarise:

- the operations undertaken
- the measures you will use to control the emissions from your process, as identified in your risk assessment or the relevant BAT conclusions, BREF or technical guidance
- how you will meet other standards set out in the relevant BAT conclusions document, BREF or technical guidance

Table 3 – Technical standards

Fill in a separate table for each activity at the installation.

Installation name	Daneshil Soil Treatment Facility	
Description of the schedule 1 activity or directly associated activity Add extra rows if you need them	Best available technique (BATC, BREF or TGN reference) (see footnote below)	Document reference (if appropriate)
See Activities & Operating Techniques		
Report		

* Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken. Give the document references you use for each plan, diagram and description.

Document reference: See Activities & Operating Techniques Report

3a1 Does your permit (in Table 1.2 Operating Techniques or similar table in the permit) have references to any of your own documents or parts of documents submitted as part of a previous application for this site?

No ☑ Now go to 3b

Yes ☐ Please tell us in a separate document what document references are no longer valid or have been superseded and why

Please also tell us below the reference number you have given the document and send it in with your application

Document reference

3 Operating techniques, continued

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	See Supporting Document
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references
Where the technical guidance or your risk assessment shows that odours are an important issue, send us your odour management plan	Document reference or references
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references

Search for 'Risk assessment for your environmental permit' at www.gov.uk/government/organisations/environment-agency.

3c Types and amounts of raw materials

Fill in Table 5 for all schedule 1 activities. Fill in a separate table for each installation.

Table 5 – Types and amounts of raw materials

Name of the installation		Daneshill Soil Treatment Facility		
Capacity (See note 1 below)				
Schedule 1 activity	Description of raw material and composition	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of the use of the raw material including any main hazards (include safety data sheets)
See Activities &				
Operating Techniques				
Report				

Notes

1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).

2 By 'maximum amount', we mean the maximum amount of raw materials on the site at any one time.

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the reference of this extra sheet.

Document reference: Activities & Operating Techniques Report

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 6 – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Incinerating waste	See the questions in appendix 3
Landfill	See the questions in appendix 4

General information

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference: See Activities & Operating Techniques Report

4b Point source emissions to air only

Provide an assessment of the sampling locations used to measure point source emissions to air. The assessment must use M1 (search for 'M1 sampling requirements for stack emission monitoring' at www.gov.uk/government/organisations/environment-agency).

Document reference of the assessment: See Treatment Description & SGN5.06 BAT Rev Report

5 Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment] (EIA)?

No ☑ Now go to section 6

Yes ☐ Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission
- the committee report and decision on the EIA

Document reference of the copy:

6 Resource efficiency and climate change

If the site is a landfill, you only need to fill in this section if the application includes landfill gas engines.

6a Describe the basic measures for improving how energy efficient your activities are

Document reference of the description: N/A

6b Provide a breakdown of any changes to the energy your activities use up and create

Document reference of the breakdown: N/A

6c Have you entered into, or will you enter into, a climate change levy agreement?

No ☑ Describe the specific measures you use for improving your energy efficiency

Document reference of the description: N/A

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY):

Please also provide documents that prove you are taking part in the agreement.

Document reference of the proof:

6d Explain and justify the raw and other materials, other substances and water that you will use

Document reference of the justification: N/A

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

If you produce waste, describe how you recover it. If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference of the description: N/A

7 How to contact us

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How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19111
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

_____

Our reference number

_____

Payment received?

No ☐

Yes ☐ Amount received

£ _____

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 4.

Appendix 1 – Specific questions for the combustion sector

1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use

Fill in a separate table for each installation.

Installation reference			
Type of fuel	When run as normal	When started up	When shut down
Coal			
Gas oil			
Heavy fuel oil			
Natural gas			
WID waste			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Other			

Notes

1 Not covered by Industrial Emissions Directive 2010/75/EU.

2 'Biomass' is referred to in www.opsi.gov.uk/si/si2002/20020914.htm.

Give extra information if it helps to explain the fuel you use.

Document reference

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation.

Fuel use and analysis					
Installation reference					
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt^{-1})
Fuel 1	
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt^{-1} means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU?

See Government Guidance.

No ☐ Now fill in part F

Yes ☐

5 What is your plant?

an existing one	☐	A plant licensed before 1 July 1987
a new one	☐	A plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003
a new-new one	☐	A plant for which an application was made on or after 27 November 2002

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

7 If you run an existing plant, have you submitted a declaration for the 'limited life derogation' set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No ☐ Now go to section 9

Yes ☐

8 Have you subsequently withdrawn your declaration?

No ☐

Yes ☐

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

Appendix 1 – Specific questions for the combustion sector, continued

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

No ☐

Yes ☐ Document reference number

11a Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Now go to question 11b

11b Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference number of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference number of the CBA

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

The description should be enough to allow us to understand:

- the process
- the main plant and equipment used for each process
- all reactions, including significant side reactions (that is, the chemistry of the process)
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled
- a comparison of the indicative BATs and benchmark emission levels standards: technical guidance notes (TGNs); additional guidance 'The production of large volume organic chemicals' (EPR 4.01); 'Speciality organic chemicals sector' (EPR 4.02); 'Inorganic chemicals sector' (EPR 4.03); and best available techniques reference documents (BREFs) for the chemical sector

Document reference

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No ☐

Yes ☐ Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No ☐

Yes ☐ Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste please also fill in questions 1, 2 and 3 of appendix 4 above.

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No ☐ You do not need to answer any other questions in this appendix

Yes ☐ IED applies

1b Are you subject to IED as

An incinerator? ☐

A co-incinerator? ☐

2 Do any of the installations contain more than one incineration line?

No ☐ Now go to question 4

Yes ☐

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation.

Installation reference	
Number of incineration lines within the installation	
Reference identifiers for each line	

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of S5.01 'Incineration of waste: additional guidance' (under the sub heading 'European legislation and your application for an EP Permit').

You must answer questions 7 to 13 on the form below.

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No ☐

Yes ☐ This allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150 mg/m^3), CO (normal ELV) and TOC (normal ELV) during abnormal operation

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on)

Appendix 3 – Specific questions for the waste incineration sector, continued

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No ☐

Yes ☐ Please give your reasons for doing this

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No ☐

Yes ☐ Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

12 Do you want to replace continuous SO_2 emission monitoring with periodic sulphur dioxide (SO_2) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m^3 as an hourly average, as allowed by IED Annex VI, Part 3?

No ☐

Does not apply ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

14a Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Please go to question 14b

14b Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference number of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference number of the CBA

Appendix 4 – Specific questions for the landfill sector

1 Provide your Environmental Setting and Installation Design (ESID) report

Document reference

2 Provide your hydrogeological risk assessment (HRA) for the site

Document reference

3 Provide your stability risk assessment (SRA) for the site

Document reference

4 Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed templates for these four reports which can be found at www.gov.uk/government/collections/environmental-permitting-landfill-sector-technical-guidance.

5 Provide your proposed plan for closing the site and your procedures for looking after the site once it has closed

Document reference

Application for an environmental permit
Part F1 – Charges and declarations

Environment Agency

Fill in this part for all applications for installations, waste operations, mining waste operations, water discharges, point source groundwater discharges and groundwater discharges onto land. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

Each individual who is applying for their name to appear on the permit must complete the declaration in section 5. You will have to print a separate copy of the declaration page for each additional individual to complete.

1 Working out charges

You must fill in this section.

You have to submit an application fee with your application. You can find out the charge by searching for 'Environment Agency charging scheme and guidance: environmental permits' at www.gov.uk/government/organisations/environment-agency.

Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type of application (fill number of activity being applied for in each column)

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/Specified Generator (SG)	Water discharge/point source discharge to groundwater	Groundwater spreading onto land
Substantial Variation					

Table 2 – Charge type (A)

Charge activity reference	Charge activity description	What are you applying to do? E.g. new, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Sect 5.2 landfill for hazardous waste	e.g. transfer	e.g. £5,561
1.16.1.1	Section 5.3 hazardous waste installation	Substantial Variation	£ 16,001.00
1.16.2.1	Section 5.4 non-hazardous installation	Substantial Variation	£ 6,992.00
1.16.4	Section 5.6 storage of hazardous waste	Substantial Variation	£ 1,600.10
1.16.1.2	Section 5.3 hazardous waste installation	Substantial Variation	£ 8,000.50
Total A			£ 32,593.60

1 Working out charges (you must fill in this section), continued

Table 3 – Additional assessment charges (B)

Part 1.19 Charges for plans and assessments			Tick appropriate
Reference	Plan or assessment	Charge	
1.19.1	Waste recovery plan	£1,231	☐
1.19.2	Habitats assessment (except where the application activity is a flood risk activity)	£779	☑
1.19.3	Fire prevention plan (except where the application activity is a farming installation)	£1,241	☐
1.19.4	Pests management plan (except where the application activity is a farming installation)	£1,241	☐
1.19.5	Emissions management plan (except where the application activity is a farming installation)	£1,241	☑
1.19.6	Odour management plan (except where the application activity is a farming installation)	£1,246	☑
1.19.7	Noise and vibration management plan (except where the application activity is a farming installation)	£1,246	☐
1.19.8	Ammonia emissions risk assessment (intensive farming applications only)	£620	☐
1.19.9	Dust and bio-aerosol management plan (intensive farming applications only)	£620	☐
	Advertising	£500	☐
Total B			£ 3,266.00

Total charges

Total A plus total B £ 35,859.60

2 Payment

Tick below to show how you have paid.

Cheque ☐

Postal order ☐

Cash ☐ Tick below to confirm you are enclosing cash with the application

Credit or debit card ☐

Electronic transfer (for example, BACS) ☑

Remittance number PSCAPPFCCDANES

Date paid (DD/MM/YYYY) 22/01/2021

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to

Cheque number

Amount £

You should make cheques or postal orders payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

Please write the name of your company and application reference number on the back of your cheque or postal order. **We will not** accept cheques with a future date on them.

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

2 Payment, continued

Paying by credit or debit card

If you are paying by credit or debit card we can call you. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

Paying by electronic transfer BACS reference

If you choose to pay by electronic transfer you will need to use the following information to make your payment.

Company name	Environment Agency
Company address	SSCL (Environment Agency), PO Box 797, Newport Gwent, NP10 8FZ
Bank	RBS/NatWest
Address	London Corporate Service Centre, CPB Services, 2nd Floor, 280 Bishopsgate, London EC2M 4RB
Sort code	60-70-80
Account number	10014411
Account name	EA RECEIPTS
Payment reference number	PSCAPPXXXXXYYY

You need to create your own reference number. It should begin with PSCAPP (to reflect that the application is for a permitted activity) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWK60708010014411 and our SWIFTBIC number is NWBKGB2L.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Provide a unique reference number for the application, i.e. do not only use the company name only	PSCAPPFCCDANES
State who is paying (full name and whether this is the agent/ applicant/other)	FCC Recycling (UK) Limited (applicant)
Fee paid	£ 35,859.60
Date payment sent (DD/MM/YYYY)	22/01/2021

Now read section 3 below

You should also email your payment details and reference number to ea_fsc_ar@gov.sscl.com.

3 Privacy notice

The Environment Agency runs the environmental permit application service.

We are the data controller for this service. A data controller determines how and why personal information is processed.

Our personal information charter explains:

- your rights
- what we do with your personal information

We're allowed to process your personal information because we have official authority as the environmental regulator. We need this information to carry out a task in the public interest that is set out in law. As the data controller, when you apply for an environmental permit, we have a legal obligation to process your personal data under the Environmental Permitting Regulations. The second lawful basis for processing your personal data is to comply with this legal obligation.

We need your personal information to process your environmental permit application. If you do not give us this information we cannot issue a permit to you. After we've issued a permit to you, we use your personal information:

- to check that you're complying with your permit
- during any potential enforcement action

What personal information we collect

If you're the individual applicant, director or company secretary of a company applying or a technically competent manager we need your:

- name
- date of birth

3 Privacy notice, continued

- address
- email address

If you're the agent, consultant, employee responsible for the activity or the employee responsible for billing and invoicing we need your:

- name
- address
- email address

If you're the applicant we need details of any:

- convictions
- bankruptcy

We also collect any questions or feedback you leave, including your email address if you contact us.

Your responsibility with other people's personal information

If you've included personal information about other people on your application, you must tell them. You must provide them with a copy of this privacy notice so that they know how their personal information will be used.

What we do with your personal information

We use your personal information to help us decide whether to issue you with a permit.

The information (except dates of birth) is available online on our consultation website during the consultation period. This website is available to everyone so your information may be seen outside the European Economic Area.

After consultation we put all the information (except dates of birth) you give us in your application on our public register.

If you can demonstrate that any information you send us is commercially or industrially confidential, we'll consider withholding that information from our public register.

If you think that the information you'll send us may be a threat to national security you must contact the Secretary Of State before you apply. You must still send us that information with your application. We will not include this information on our public register unless the Secretary of State decides it can be included.

See the environmental permitting guidance for guidance on national security.

We may use your email address to contact you for user research to improve our service. You don't have to take part in the research.

Where your personal information is processed and stored

We store and process your personal information on servers in the UK. We will not host your personal information outside the European Economic Area.

We do not use your personal information to make an automated decision or for automated profiling.

How long we keep your personal information

We keep your personal information while your permit is in use and for 7 years after you surrender your permit. If the permit is for a landfill site, we keep the data for 10 years after surrender.

Removing personal information from the public register

We will remove your personal information from the public register if:

- you withdraw your application
- we refuse your application and the time limit for appealing the decision has expired or an appeal is dismissed
- the information is no longer relevant for public participation purposes under the Environmental Permitting Regulations

Contact

Our Data Protection Team gives independent advice. They monitor how the Environment Agency uses your personal information.

If you have questions or concerns about how we process personal information, or to make a complaint or request relating to data protection, please contact:

Address: Data Protection Team
Environment Agency
Horizon House
Deanery Road
Bristol
BS1 5AH

3 Privacy notice, continued

Email: dataprotection@environment-agency.gov.uk

You can also make a complaint to the Information Commissioner's Office (ICO).

The ICO is the supervisory authority for data protection legislation. The ICO website has a full list of your rights under data protection legislation.

Now read section 4 below

4 Confidentiality and national security

Confidentiality

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application. You can find guidance on confidentiality in 'Environmental permitting guidance: core guidance', published by Defra and available via our website at www.gov.uk/government/organisations/environment-agency.

Only tick the box below if you wish to claim confidentiality for your application

Please treat the information in my application as confidential ☐

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Environmental permitting guidance: core guidance', published by Defra and available via our website at www.gov.uk/government/organisations/environment-agency.

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

If you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

Note: we will issue a letter to both current and new holders to confirm the transfer. If you are changing address we will need to send this letter to your new address; therefore please tell us your new address in a separate letter.

If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities) ☐

Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well) ☑

Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1) ☐

5 Declaration, continued

Name

Title (Mr, Mrs, Miss and so on)	Mr
First name	Vicente
Last name	Orts-Llopis
on behalf of (if relevant; for example, a company or organisation and so on)	FCC Recycling (UK) Limited
Position (if relevant; for example, in a company or organisation and so on)	Director
Today's date (DD/MM/YYYY)	22/01/2021

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)	☐

Name

Title (Mr, Mrs, Miss and so on)	
First name	
Last name	
on behalf of (if relevant; for example, a company or organisation and so on)	
Position (if relevant; for example, in a company or organisation and so on)	
Today's date (DD/MM/YYYY)	

Now go to section 6

6 Application checklist

You must fill in this section.

If your application is not complete we will return it to you. If you aren't sure about what you need to send, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this form that are relevant to you and your activities	☑
Identify relevant supporting information in the form and send it with the application	☑
List all the documents you are sending in the table below. If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below	☑
For new permits or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1	☐
Provide a supporting letter for any claim that information is confidential	☐
Get the declaration completed by a relevant person (not an agent)	☑
Send the correct fee	☑

6 Application checklist, continued

Question reference	Document title	Document reference
Part A, Q5c	Supporting Document	3982-CAU-XX-XX-RP-V-0300-A0-C1
Part C2 Q2b, Q2 Table 1	Supporting Document	3982-CAU-XX-XX-RP-V-0300-A0-C1
Q3, Appendix 2		
Part C2 Q5c	Non-Technical Summary	3982-CAU-XX-XX-RP-V-0302-A0-C1
Part C2 Q6	Amenity and Accidents Risk Assessment	3982-CAU-XX-XX-RP-V-0303-A0-C1
Part C3 Q1, Q3b Table 4	Supporting Document	3982-CAU-XX-XX-RP-V-0300-A0-C1
Part C3 Table 1a, Q1	Activities and Operating Techniques	3982-CAU-XX-XX-RP-V-0305-A0-C1
Table 2, Table 3, Table 5		
Q4a		
Part C3 Q4b	Treatment Description & SGN 5.06 BAT Review	3982-CAU-XX-XX-RP-V-0306-A0-C1
Part C3 Appendix 7	Environmental Setting and Installation Design	3982-CAU-XX-XX-RP-V-0304-A0-C1

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: https://www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

8 Where to send your application

For how many copies to send see the guidance note on part F1.

Please send your filled in application form to:

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in part A) ☑

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Amenity and Accident Risk Assessment
Environmental Permit Variation Application
Dated September 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soil Treatment Facility

FCC Recycling (UK) Limited

Amenity and Accident Risk Assessment

Environmental Permit Variation Application

Prepared by:

Caulmert Limited
14, Farrington Way, Eastwood link Business Park, Eastwood, Notts NG16 3BF
Tel: 01773 749132
Fax: 01773 746280
Email: andystocks@caulmert.com
Web: www.caulmert.com

Doc ref: 3982-CAU-XX-XX-RP-V-0303-A0.C2

September 2021

APPROVAL RECORD

Site:	Daneshill Landfill Site
Client:	FCC Environment Limited
Project Title:	Daneshill Soils Treatment Facility
Document Title:	Amenity and Accident Risk Assessment
Document Ref:	3982-CAU-XX-XX-RP-V-0302-A0.C2
Report Status:	**Final**
Project Manager:	Andy Stocks
Caulmert Limited:	14, Farrington Way, Eastwood link Business Park, Eastwood, Notts NG16 3BF
Tel:	01773 749132

Author	Kellie-Marie P. Burston	**Date**	15/01/2021
Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

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Table 3: Noise risk assessment
Table 4: Fugitive emissions risk assessment
Table 5: Accidents risk assessment

DRAWINGS

3982-CAU-XX-XX-DR-V-1800 Sensitive Receptors Plan

1.1 Background

1.1.1 This report is an amenity and accident risk assessment of the impact of the activities subject to this variation and forms part of the permit variation application.

1.1.2 FCC Recycling (UK), the Operator, proposes a number of permit variation activities including the operations of a Soils Treatment Facility (STF) within the footprint of their Daneshill Landfill Site. The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous soils and 20,001 tonnes of non-hazardous waste. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The total storage capacity of the site is 50,000 tonnes. The usual maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

1.1.3 The proposed bioremediation process will utilise industry standard biopile technology and will operate through means of use of biopiles and moisture control, addition of suitable amendments to the soil, forced air extraction to encourage micro-organism growth and breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. The hazardous soils contaminated with asbestos fragments will undergo pre-screening and hand picking to remove oversized asbestos materials. The non-hazardous soils maybe also be screened to remove oversize inclusions prior to use in the restoration of the landfill after validation testing is complete.

1.1.4 All soils will be stored and processed on a newly constructed treatment pad with impermeable surfacing, as there is no surface water/foul sewer connections, the treatment pad will be constructed with sealed drainage which will be pumped to holding tanks prior to collection and treatment at a suitable facility.

1.1.5 In addition to the STF, it is proposed to add the following listed activities to the current permit to facilitate this proposed operation

- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.2 Identification of receptors

1.2.1 The Site is centred on national grid reference SK6764786722 within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits.

1.2.2 The proposed STF site is in a predominantly agricultural setting, the nearest residential dwellings include a travellers site located 155m SWS from the proposed treatment facility and Loundfield Farm 500m to the east. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

1.2.3 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

1.2.4 It is considered that the potential pathway for emissions from the site is via airborne transport. Meteorological data from windfinder.com details that the prevailing wind direction for Doncaster/Sheffield Weather is from the south-west/west-south-west towards north-east and east-north-east. Given the location and orientation of Doncaster/Sheffield airport, it is considered that weather patterns will reflect those similarly experienced at Daneshill Landfill Site.

1.2.5 The wind direction is likely to blow towards Mattersey Village and agricultural fields. Given the distance from the site boundary and the transient nature of odours and dust from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

1.2.6 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

1.2.7 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

1.2.8 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

1.2.9 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Travellers Site	Residential	155m	SWS, S
Daneshill Road	Public road	250-500m	S, W, SW

Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

1.2.10 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

1.2.11 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

1.2.12 The site is not located within a flood risk zone.

2.1 Odour, noise and vibration, fugitive emissions and accidents risk assessments

2.1.1 Separate risk assessment tables have been completed for odour, noise and vibration, fugitive emissions and accidents in line with GOV.UK guidance document.

2.1.2 Possible hazards (i.e. odour sources, sources of noise or vibration, sources of fugitive emissions that could be harm the environment or escape beyond the permit boundary and possible sources of accidents that could harm the environment) have been identified. For each possible hazard, an assessment of the risk that it poses to potential receptors has been carried out; taking into account the control measures that will be in place.

2.1.3 The STF will be handling and processing hazardous soils contaminated with bound asbestos. That will undergo initial waste characterisation to ensure asbestos fibre levels are compliant with waste acceptance limits prior to pre-screening and hand picking of bound asbestos fragments. Asbestos containing soils are detailed further below and the possible hazards detailed above has been considered further.

2.2 Asbestos Storage

2.2.1 Upon satisfactory pre-acceptance and waste acceptance checks, on arrival to site, the soils will be weighed and directed from the weighbridge to the soils reception area and undergo an inspection and sampling for reception analytical testing. Asbestos soils will be stored on an impermeable surfaced pad provided with bunding and sealed drainage. After placement on the storage area, the soils will be sheeted to reduce the potential for air borne emissions. The pre-acceptance testing is carried out to confirm that the soil does not contain asbestos fibres above >0.1% for chrysotile and >0.01% for other forms of asbestos to ensure that airborne asbestos fibres cannot be generated at concentrations above the HSE clearance/reoccupation limit of 0.01f/ml at the treatment equipment location and an agreed background reference level at the site boundary (See Section 8 Monitoring in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307). Until this initial reception testing has been completed, the soils will remain sheeted. Following formal compliance with the waste acceptance limits confirming that there are no unacceptable asbestos fibre concentrations, the soil is formally accepted and can be stored un-sheeted and will undergo pre-screening and handpicking for asbestos fragments. Soils containing asbestos of >0.1% for chrysotile and >0.01% for other asbestos types, that are observed to contain asbestos concentrations in excess of the waste acceptance limits, will be rejected from site.

2.3 Pre-screening and Handpicking of asbestos containing soils

2.3.1 Pre-screening will be carried out prior to hand picking. Formally accepted soils can be un-sheeted as they have no potential for releasing airborne asbestos fibres above the detection limit of 0.01f/ml or the agreed background reference level. The picking station will provide an enclosed working area for hand-picking. A conveyor belt will be used on

the picking line providing a effective means for removing visible bound asbestos. Handpicking of small bound asbestos inclusions will only be undertaken by suitably trained operatives and recovered asbestos fractions will be placed in individual polythene bags within the picking station. The bags will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin.

2.3.2 Dust suppression will be provided for the screener as a dust mitigation measure if required, in addition, air monitoring will be carried out to assess airborne concentrations of asbestos fibres. Further detail on controls and mitigation for the release of emissions from the proposed activities are provided in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.

2.3.3 The risk assessments are presented in Table 2 to 5 below.

Table 2: Odour risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Odour from the transfer and treatment of contaminated soils.	Workers and visitors to the site. Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air	Preventative measures include: • General housekeeping, such as sweeping of surfaces and machinery being cleared regularly of residue build up. • Air extracted through the biopiles will pass through a biofilter before being discharged to air, which will reduce any VOC's present that have the potential to create odour. • Meteorological conditions should be considered before activities such as transfer of waste takes place, these activities should be minimised during unfavourable wind conditions, in particular when winds are towards receptors to the south-east. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308.	**Fairly unlikely**. Waste acceptance measures will ensure that soils are not be overly odorous. Should any particular odorous soils be accepted the biofilter is in place to mitigate the potential for odour.	Seasonal variations such as warmer temperatures in the spring and summer has the potential for increased odour nuisance to human/residential receptors.	**Low - provided management procedures adhered to**

Odour from reception and storage of contaminated soils.	Local human population Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air transport, then inhalation.	Odour could be generated during delivery and offloading, sorting, or during stockpiling. Measures to prevent odour nuisance from the reception and initial storage of soils will include: • Waste acceptance procedures to ensure that only suitable soils are accepted. This includes hydrocarbon contaminated soils. The potential for odour problems will be assessed on receipt and actions, including immediate rejection taken when required. • Excessively malodorous soils will not be authorised for acceptance, if any are deposited on site they be removed from site and a non-conformance note issued. • Odour olfactory monitoring undertaken daily to assess odour levels from site activities. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308.	The frequency of exposure is likely to be **low** as: Receptors are some distance away (>200m). The travellers site is not downwind to the proposed facility, therefore significant impact not likely. the prevailing wind direction is south west	Nuisance	**Low - provided management procedures adhered to**
Odour from Soil Bioremediation Process	Local human population Industrial works located within a 500m radius of the site. Residential receptors	Air transport, then inhalation.	Measures to prevent odour nuisance from soil bioremediation process will include: • Industry standard biopile technology • Moisture control • Forced air extraction to encourage micro-organism growth. • Addition of suitable materials (nutrients and fertilizer) to the soil. • Continuous running of the bioremediation process under vacuum extraction.	The frequency of exposure is likely to be **low** as: Following industry standards will allow for sufficient oxygen ingress to minimise the impact of odours.	Nuisance, loss of amenity	**Low - provided management procedures adhered to**

	within 200m of the site.		• A biofilter will be in place to reduce odour as well as filter out any VOC's present. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308. • Odour olfactory monitoring undertaken daily to assess odour levels from site activities.			
VOC and odour emissions resulting from waste handling, screening and biopile turning operations	See Section 3 'Potentially Sensitive Receptors' Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Wind – airborne See Section 6 'Potential Pathways'	Preventive and mitigation measures include: • Site visit prior to input to assess the odour potential of soils • Only authorise if odours/VOCs are biologically treatable contaminants and can be mitigated easily on site, no residual unacceptable odour/VOCs could remain after treatment and air actively removed from soil can be treated by biofilter during treatment • Soils are only formally accepted subject to reception testing and compliance with the original waste description. • Review against original waste description and quarantine if required • Cover with tarpaulin/soil/woodchip prior to reception analysis results	**Low** Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. Direction of predominant wind not towards adjacent sensitive, travellers site and	Odour nuisances	**Low - provided management procedures adhered to**

			being received or formal rejection (use tarpaulin only for potential rejection) • Place on air extraction systems to capture vapours/odours. • Monitoring of soil gases in extraction pipes to ensure total VOCs are below 40ppm/benzene below 1ppm prior to commencing soil turnover • Soil decompaction results in the opening of 3m wide sections of the biopile at any one time, this is to be sealed at the end of each working day • Biopile vacuum system to always maintain operation on pipes under stockpiled soil • Biofilter flow rates to be adjusted to increase retention time if there is odour potential at the biofilter during soil turnover. • No screening of high VOCs/potentially odorous soils is ever undertaken. No screening is required prior to, or during biotreatment Only screen soils where odours are not present (i.e., completion of treatment is only	residential receptors		

			complete when soils have no odour, are non-hazardous and meet the site reuse criteria)			

Table 3: Noise risk assessment and management plan

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Noise from soil handling and treatment.	Workers and visitors to the site. Residential receptors at Travellers Site	Air	Preventative measures include: • Fully trained and competent plant operators to operate silenced machinery. • Daily site inspections will include routine checks to ensure noise emissions from site operations are not overly excessive. • Maintenance of mobile plant/equipment in line with manufactures specifications to ensure screening/turning process produces minimal noise. • Vacuum extraction blowers and pumps are housed in acoustic enclosures to significantly reduce noise levels from the soil and water treatment equipment • Restriction of operating hours to non-sensitive times of day would normally form part of the planning consent conditions. • Where practicable, mobile plant and site equipment fitted with silencers or acoustic hoods.	**Low** It is considered that receptors residing at the Travellers site are unlikely to be significantly impact by operations at the STF due to existing background noise levels from the vehicle dismantler site and ready mix plant. Residential receptors are unlikely to be	Noise may cause annoyance to people working in the local businesses within 300m of the site.	**Low - provided management procedures adhered to**

			• Avoiding un-necessary revving of engines, engines switched off when not in use or idle for long durations. • Use of broadband type noise reverse alarms (i.e. non-beeper type) • Minimisation of drop heights during tipping; • Local industries nearby include a cement factory and vehicle dismantling workshop – these industries are inherently noisy operations and working on site unlikely to be impacted by noise operations from the site as baseline noise levels are established. • Noise Impact Assessment undertaken by Spire Environmental (document ref: R20.1365-2-AG) concluded that the proposed STF and asbestos operations at the site would not result in any additional noise that would be above the existing planning permissions noise conditions at site. The STF plant does not increase the overall noise levels during landfill operations. Noise is also not expected to be significant during the construction phase. Further noise control and mitigation measures are detail within the Noise Impact Assessment.	affected at >200m distance.		

Table 4: Fugitive emissions risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			DUST			
Dust from contaminated soil treatment Dust from storage of hazardous storage	Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air - wind borne dust.	Preventative measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply and dust suppression by regular spraying in dry conditions; • Waste acceptance procedures to ensure soils that have the potential for dust emissions are not accepted • Dust suppression cannon/system with added asbestos surfactant; • Asbestos monitoring will be carried out quarterly against background reference levels determined with on site monitoring as a pre-commencement condition; • use of clean water for dust suppression, to avoid re-circulating fine material;	**Low** Emissions Management Plan in place under document ref: 3982-CAU-XX-XX-RP-V-0307. Dust emissions are transient in nature and likely to dissipate before settling Nearest residential receptors unlikely	Nuisance - dust on cars, clothing etc.	**Low - provided management procedures adhered to**

			• high standards of house-keeping to minimise track-out and windblown dust; • a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment; • minimisation of drop heights during tipping; • clear delineation of stockpiles to deter vehicles from running over edges; and • effective staff training in respect of the causes and prevention of dust. • Daily dust monitoring carried out to assess levels of emissions from site activities. • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site. **Specific measures** in relation to activities within the treatment facility include: • Misting equipment to be employed if required during summer months Meteorological conditions should be considered before activities such as transfer, and this activity should be minimised during unfavourable wind conditions.	to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. In addition, background dust from external sources at the Retford Concrete Plant, is likely to impact on Travellers site due to close distance. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors		

Pre-screening of asbestos soils Handpicking of asbestos soils	Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Wind – airborne asbestos fibres and inhalation	Preventative measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply by regular spraying in dry conditions with added asbestos surfactant; • Dust suppression cannon/system • Asbestos monitoring will be carried out quarterly against background reference levels determined with onsite monitoring as a pre-commencement condition; • For occupational exposure, daily asbestos monitoring will be carried out during soil screening operations. (See 'Section 8 Monitoring' in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307. • Use of clean water for suppression, to avoid re-circulating fine material; • Minimisation of drop heights during tipping; • Hand-picking operations are carried out in a fully enclosed picking station; • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site.	**Low** Emissions Management Plan in place under document ref: 3982-CAU-XX-XX-RP-V-0307. Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors	Asbestos linked illness	**Low - provided management procedures adhered to**

			To Water			
Runoff from site surfacing directly into surface water.	Surface waters downstream of site	Surface water drainage system	The site's treatment areas comprise impermeable pads and sealed drainage which is pumped to holding tanks (disposed of to an appropriate and permitted facility)	**Unlikely** given the treatment plant which is in place. (Accidental spillages are dealt with in Table 5).	Contamination of local surface water.	**Low - provided management procedures adhered to**
Contaminated run-off percolating through ground.	Groundwater or surface waters close to the site	Migration through site surfacing and underlying soil.	Measures to control contaminated runoff into ground will include: • Offloading of soils to be supervised by suitably trained staff who will be aware of storage requirements for various wastes. • Daily site inspections will include checks to see that soils are stored in their designated storage areas. • All areas used for storage or handling of soils that may have contaminated runoff will be on impermeable pads which drain to sealed drainage sumps, containing any run-off. • Regular inspections of impermeable ground: Any damage detected that could impair the integrity of the pad should be recorded and repairs carried out as soon as possible. • All storage areas are bunded to contain run-off which drains into the network into the holding tanks.	**Unlikely**. The areas of the site used for soil activities are located on impermeable pads which drain to sealed drainage sumps.	Contamination of groundwater and surface water.	**Very low**
			Pests			
Rodents/ pests	Workers and visitors to site, nearby agricultural land.	Over ground.	Unlikely due to nature of wastes accepted Measures taken to prevent infestation: • Daily site inspections will monitor for the presence of rats/pests on site.	**Unlikely** However, with any kind of biodegradable waste, occasionally	General nuisance and health risk from rats being vectors for human	**Low provided management procedures adhered to**

			• Waste acceptance procedures will ensure that non-conforming wastes are rejected. • Soils unlikely to attract rodents if strict waste acceptance procedures adhered to. • In general, good housekeeping with regular sweeping and clearing of waste areas is encouraged. Actions in the event of rodents/pests being detected at the site: - • The incident must be reported to the site manager; • A record must be made of the incident and actions taken; • Waste acceptance and storage procedures should be reviewed; and • Specialist pest control contractor will visit site regularly and on an ad hoc basis.	rats/s can be present, but the types of wastes are unlikely to result in rats/pests being a significant problem.	pathogens (e.g. weil's disease).	
Flies breeding in in soils treatment facility.	Workers and visitors to site. Residential receptors > 200 m from site and travellers site.	Air	Unlikely due to nature of wastes accepted Measures taken to prevent infestation: • Waste acceptance procedures will ensure that non-conforming wastes are rejected. • Daily site inspections will monitor for the presence of flies on site. • In general, good housekeeping with regular sweeping and clearing of waste areas is encouraged. Actions in the event of a fly infestation being detected at the site: - • The incident must be reported to the site manager; • A record must be made of the incident and actions taken;	**Fairly Unlikely** Significant flies are not anticipated	General nuisance	**Low - provided management procedures adhered to**

			• Waste acceptance and storage procedures should be reviewed; and In the event of severe infestations, the specialist pest control contractor will visit more regularly and on an ad hoc basis.			
Mud/Litter						
Litter from off-loading and processing of mixed loads including possibility of some light wastes.	Workers and visitors to industrial estate. Sensitive Receptors dwelling at nearby Travellers Site.	Air - via wind.	Measures taken to prevent litter leaving the site: • Waste acceptance procedures to ensure the acceptance of only approved waste. Actions in the event of litter being detected leaving the site: - • Litter picking will be carried out. Priority is given to clearing any litter outside the permit boundary furthest away and working inwards. • The incident must be reported to the site manager. • A record must be made of the incident and actions taken. • Waste acceptance, storage and treatment procedures should be reviewed, and additional control imposed as deemed necessary by the site manager.	**Unlikely** Litter may be identified from time to time but likely to be in relatively small quantities and only problematic during high winds.	Nuisance to nearby receptors.	**Low - provided management procedures adhered to**
Mud being tracked onto surrounding roads.	Workers and visitors to site and users of surrounding roads	Tracking on vehicle tyres entering/leaving the site.	Measures taken to prevent mud leaving the site: • Roads and site areas will be regularly inspected/swept. • Drivers will be encouraged to ensure their vehicle tyres are clean before leaving site and that any loose material is in enclosed containers or the loads are sheeted or netted. • Daily site inspections will monitor for mud or debris being tracked from the site.	**Unlikely** Mud and debris may be tracked onto surrounding roads.	Nuisance to nearby road users In severe circumstances, mud on the road could affect road safety.	**Low - provided management procedures adhered to.**

			• In general, good housekeeping with regular sweeping and clearing of debris is encouraged. • Road sweeper can be hired in as necessary. Actions in the event of mud and debris is being tracked onto roads outside the site: - • Affected road areas will be swept. • The incident must be reported to the site manager. • A record must be made of the incident and actions taken.			

Table 5: Accidents risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Spillage or leak of fuel or other hazardous liquids.	Underlying soil, Groundwater and/or Surface water.	Through site surfacing and ground.	Fuel and various liquid products used in equipment or vehicle maintenance may have hazardous properties. These could leak during storage or spillages could occur during use. **Preventative measures**: • The soil bioremediation operation and associated activities take place on impermeable surfacing with drainage to holding tanks. • The site surfacing will be bunded to ensure that any leaks are contained within the facility. • All fuels and tanks will be appropriately stored and bunded. • Regular inspections to check for integrity of site surfacing and correct storage of any hazardous liquids e.g. fuel for mobile plant. • All staff involved in soils handling will be inducted in the emergency procedures regarding the handling of spills.	**Unlikely** Impermeable pads will prevent migration of spills or leakages to underlying ground. In the event of any uncontained spill, the drainage system will collect any oil spillages and other hazardous liquids would be collected by the drainage system. On that basis, it is very unlikely that any	Contamination of local water course or underlying ground or groundwater.	**Low - provided management procedures adhered to.**

			Actions in the event of spillages: • Incidents to be managed in accordance with emergency procedures regarding the handling of spills. • Spillages will be contained using appropriate spill kits or absorbent materials (e.g. soils). • Depending on the severity of the spill, the Environment Agency will be contacted. The emergency procedure includes incident reporting and, as part of the environmental management system, incidents will be reviewed by management on a regular basis.	spills would reach water courses or groundwater.		
Fire in processing areas.	Surface water receiving contaminated fire waters. Surrounding site facilities. Air.	Air Ground.	Unlikely for fires to occur on waste piles due to the nature of the waste itself. Fires could occur as a result of arson, from sources of ignition, or from electrical faults on site. Unlikely for contaminated fire waters to enter surface/groundwater water environment as the site will be served with impermeable surfacing which will be kerbed and provided with sealed drainage pumped to site holding tanks. **Preventative measures**: • No smoking policy. • Emergency vehicles will be able to gain access to all operational areas. • All staff involved in soil handling will be inducted in the emergency procedures	Even with measures in place to prevent the occurrence of fires, it is possible that fires could break out. However, measures in place to prevent the fire spreading or to limit its consequences will significantly reduce the probability of receptors being affected by a fire.	Smoke, local nuisance, risk of fire spreading to other areas or properties.	**Low - as long as management procedures adhered to.**

			including the fire action plan and a regular fire drill. • Daily checks and emergency procedures in place to prevent fire risk. • Site staff trained in fire risk and how to deal with an incident on site. • Any visitors to the site will be inducted and be made aware of the fire risks. • **Actions** in the event of fire: • Where it is safe to do so, site staff will use on-site fire-fighting equipment to extinguish fires. • Where a fire may have been caused by electricity or is close to electrical equipment, electricity to that area should be switched off and isolated. • Clear directions will be given to the fire service and a member of staff will wait at the entrance to the site to direct the service to the site on arrival, to ensure that the speediest service is provided. • A list of actions is outlined in the Fire Prevention Plan and associated Fire Risk Assessment The emergency procedure includes incident reporting. As part of the environmental management system, incidents will be reviewed by management on a regular basis to identify whether lessons can be learnt, and procedures improved.			

Flooding	Underlying soil. Groundwater. Surface water.	Flood water. Drainage systems.	**Preventative measures:** • Materials with hazardous properties (e.g. fuel) are contained and unlikely to leak as a result of partial submersion. • Flood Risk Assessment, document ref: 3982-CAU-XX-XX-RP-C-0300 indicates that the site is not at risk of flooding. **Actions** in the event of flooding: • In the event of flood warnings for the area, the site manager or technically competent manager should consider the possibilities of moving waste materials or any other materials with hazardous properties • Where flooding could reach areas where electrical equipment is used, electricity to that area should be switched off and isolated. • After flood waters have receded, the areas outside the site should be inspected and any materials which have escaped the boundary should be picked up.	**Unlikely.** None of operational area of the site is deemed to within flood zone1. [1] (low risk of flooding)	Contamination of surface waters or surrounding areas with soil materials could, depending on the properties of the soils (hydrocarbon content), affect water quality or be unsightly.	**Low**.
Soils treatment process failure, material becoming anaerobic and giving rise to odours	Local human population	Air transport, then inhalation	Preventative measures will include: • Good management of the treatment process, i.e. good mixing, aeration and regular monitoring, experienced and competent staff. In the event of failure of the treatment process:	**Unlikely,** the likelihood of soils becoming anaerobic is low.	Odour nuisance.	**low**

[1] Daneshill Landfill Soil Treatment Facility Flood Risk Assessment November 2019, 3982-CAU-XX-XX-RP-C-0300.

			• If material has become anaerobic and malodorous, the material may be covered with more soils to minimise odour and, if required, the removal of the failed material to landfill.			

3.1.1 The risk assessments above enable identification of appropriate mitigation measures to control the amenity and accident risks from the activities in relation to the proposed contaminated soils treatment facility. All identified risk mitigation measures will be incorporated within the management system for the site.

3.1.2 The amenity and accident risk assessment indicate that provided the identified risk mitigation measures (as identified in the tables above) are implemented, the risk of nuisance or pollution from fugitive emissions or accidents is low and will not present a significant impact on nearby receptors.

1. GOV.UK Guidance 'Risk assessments for your environmental permit' Updated 10th January 2019 – replaces previous: Environment Agency (2010): How to comply with your environmental permit. Additional guidance for: Horizontal Guidance Note H1 - Annex (a).

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Amenity and Accident Risk Assessment
Environmental Permit Variation Application
Dated January 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soil Treatment Facility

FCC Recycling (UK) Limited

Amenity and Accident Risk Assessment

Environmental Permit Variation Application

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APPROVAL RECORD

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Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

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DRAWINGS

3982-CAU-XX-XX-DR-V-1800 Sensitive Receptors Plan

1.1 Background

1.1.1 This report is an amenity and accident risk assessment of the impact of the activities subject to this variation and forms part of the permit variation application.

1.1.2 FCC Recycling (UK), the Operator, proposes a number of permit variation activities including the operations of a Soils Treatment Facility (STF) within the footprint of their Daneshill Landfill Site. The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous soils and 20,001 tonnes of non-hazardous waste. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The total storage capacity of the site is 50,000 tonnes. The usual maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

1.1.3 The proposed bioremediation process will utilise industry standard biopile technology and will operate through means of use of biopiles and moisture control, addition of suitable amendments to the soil, forced air extraction to encourage micro-organism growth and breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. The hazardous soils contaminated with asbestos fragments will undergo pre-screening and hand picking to remove oversized asbestos materials. The non-hazardous soils maybe also be screened to remove oversize inclusions prior to use in the restoration of the landfill after validation testing is complete.

1.1.4 All soils will be stored and processed on a newly constructed treatment pad with impermeable surfacing, as there is no surface water/foul sewer connections, the treatment pad will be constructed with sealed drainage which will be pumped to holding tanks prior to collection and treatment at a suitable facility.

1.1.5 In addition to the STF, it is proposed to add the following listed activities to the current permit to facilitate this proposed operation

- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.2 Identification of receptors

1.2.1 The Site is centred on national grid reference SK6764786722 within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits.

1.2.2 The proposed STF site is in a predominantly agricultural setting, the nearest residential dwellings include a travellers site located 155m SWS from the proposed treatment facility and Loundfield Farm 500m to the east. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

1.2.3 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

1.2.4 It is considered that the potential pathway for emissions from the site is via airborne transport. Meteorological data from windfinder.com details that the prevailing wind direction for Doncaster/Sheffield Weather is from the south-west/west-south-west towards north-east and east-north-east. Given the location and orientation of Doncaster/Sheffield airport, it is considered that weather patterns will reflect those similarly experienced at Daneshill Landfill Site.

1.2.5 The wind direction is likely to blow towards Mattersey Village and agricultural fields. Given the distance from the site boundary and the transient nature of odours and dust from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

1.2.6 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

1.2.7 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

1.2.8 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

1.2.9 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Travellers Site	Residential	155m	SWS, S
Daneshill Road	Public road	250-500m	S, W, SW

Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

1.2.10 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

1.2.11 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

1.2.12 The site is not located within a flood risk zone.

2.1 Odour, noise and vibration, fugitive emissions and accidents risk assessments

2.1.1 Separate risk assessment tables have been completed for odour, noise and vibration, fugitive emissions and accidents in line with GOV.UK guidance document.

2.1.2 Possible hazards (i.e. odour sources, sources of noise or vibration, sources of fugitive emissions that could be harm the environment or escape beyond the permit boundary and possible sources of accidents that could harm the environment) have been identified. For each possible hazard, an assessment of the risk that it poses to potential receptors has been carried out; taking into account the control measures that will be in place.

2.1.3 The STF will be handling and processing hazardous soils contaminated with bound asbestos. That will undergo initial waste characterisation to ensure asbestos fibre levels are compliant with waste acceptance limits prior to pre-screening and hand picking of bound asbestos fragments. Asbestos containing soils are detailed further below and the possible hazards detailed above has been considered further.

2.2 Asbestos Storage

2.2.1 Upon satisfactory pre-acceptance and waste acceptance checks, on arrival to site, the soils will be weighed and directed from the weighbridge to the soils reception area and undergo an inspection and sampling for reception analytical testing. Asbestos soils will be stored on an impermeable surfaced pad provided with bunding and sealed drainage. After placement on the storage area, the soils will be sheeted to reduce the potential for air borne emissions. The pre-acceptance testing is carried out to confirm that the soil does not contain asbestos fibres above >0.1% for chrysotile and >0.01% for other forms of asbestos to ensure that airborne asbestos fibres cannot be generated at concentrations above the HSE clearance/reoccupation limit of 0.01f/ml at the treatment equipment location and an agreed background reference level at the site boundary (See Section 8 Monitoring in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307). Until this initial reception testing has been completed, the soils will remain sheeted. Following formal compliance with the waste acceptance limits confirming that there are no unacceptable asbestos fibre concentrations, the soil is formally accepted and can be stored un-sheeted and will undergo pre-screening and handpicking for asbestos fragments. Soils containing asbestos of >0.1% for chrysotile and >0.01% for other asbestos types, that are observed to contain asbestos concentrations in excess of the waste acceptance limits, will be rejected from site.

2.3 Pre-screening and Handpicking of asbestos containing soils

2.3.1 Pre-screening will be carried out prior to hand picking. Formally accepted soils can be un-sheeted as they have no potential for releasing airborne asbestos fibres above the detection limit of 0.01f/ml or the agreed background reference level. The picking station will provide an enclosed working area for hand-picking. A conveyor belt will be used on

the picking line providing a effective means for removing visible bound asbestos. Handpicking of small bound asbestos inclusions will only be undertaken by suitably trained operatives and recovered asbestos fractions will be placed in individual polythene bags within the picking station. The bags will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin.

2.3.2 Dust suppression will be provided for the screener as a dust mitigation measure if required, in addition, air monitoring will be carried out to assess airborne concentrations of asbestos fibres. Further detail on controls and mitigation for the release of emissions from the proposed activities are provided in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.

2.3.3 The risk assessments are presented in Table 2 to 5 below.

Table 2: Odour risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Odour from the transfer and treatment of contaminated soils.	Workers and visitors to the site. Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air	Preventative measures include: • General housekeeping, such as sweeping of surfaces and machinery being cleared regularly of residue build up. • Air extracted through the biopiles will pass through a biofilter before being discharged to air, which will reduce any VOC's present that have the potential to create odour. • Meteorological conditions should be considered before activities such as transfer of waste takes place, these activities should be minimised during unfavourable wind conditions, in particular when winds are towards receptors to the south-east. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308.	**Fairly unlikely**. Waste acceptance measures will ensure that soils are not be overly odorous. Should any particular odorous soils be accepted the biofilter is in place to mitigate the potential for odour.	Seasonal variations such as warmer temperatures in the spring and summer has the potential for increased odour nuisance to human/residential receptors.	**Low - provided management procedures adhered to**

Odour from reception and storage of contaminated soils.	Local human population Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air transport, then inhalation.	Odour could be generated during delivery and offloading, sorting, or during stockpiling. Measures to prevent odour nuisance from the reception and initial storage of soils will include: • Waste acceptance procedures to ensure that only suitable soils are accepted. This includes hydrocarbon contaminated soils. The potential for odour problems will be assessed on receipt and actions, including immediate rejection taken when required. • Excessively malodorous soils will not be authorised for acceptance, if any are deposited on site they be removed from site and a non-conformance note issued. • Odour olfactory monitoring undertaken daily to assess odour levels from site activities. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308.	The frequency of exposure is likely to be **low** as: Receptors are some distance away (>200m). The travellers site is not downwind to the proposed facility, therefore significant impact not likely. the prevailing wind direction is south west	Nuisance	**Low - provided management procedures adhered to**
Odour from Soil Bioremediation Process	Local human population Industrial works located within a 500m radius of the site. Residential receptors	Air transport, then inhalation.	Measures to prevent odour nuisance from soil bioremediation process will include: • Industry standard biopile technology • Moisture control • Forced air extraction to encourage micro-organism growth. • Addition of suitable materials (nutrients and fertilizer) to the soil. • Continuous running of the bioremediation process under vacuum extraction.	The frequency of exposure is likely to be **low** as: Following industry standards will allow for sufficient oxygen ingress to minimise the impact of odours.	Nuisance, loss of amenity	**Low - provided management procedures adhered to**

	within 200m of the site.		• A biofilter will be in place to reduce odour as well as filter out any VOC's present. • An Odour Management Plan has been included as part of the application which details site controls and procedures for odours, under document ref: 3982-CAU-XX-XX-RP-V-0308. • Odour olfactory monitoring undertaken daily to assess odour levels from site activities.			

Table 3: Noise risk assessment and management plan

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Noise from soil handling and treatment.	Workers and visitors to the site. Residential receptors at Travellers Site	Air	Preventative measures include: • Fully trained and competent plant operators to operate silenced machinery. • Daily site inspections will include routine checks to ensure noise emissions from site operations are not overly excessive. • Maintenance of mobile plant/equipment in line with manufactures specifications to ensure screening/turning process produces minimal noise. • Vacuum extraction blowers and pumps are housed in acoustic enclosures to significantly reduce noise levels from the soil and water treatment equipment • Restriction of operating hours to non-sensitive times of day would normally form part of the planning consent conditions. • Where practicable, mobile plant and site equipment fitted with silencers or acoustic hoods.	**Low** It is considered that receptors residing at the Travellers site are unlikely to be significantly impact by operations at the STF due to existing background noise levels from the vehicle dismantler site and ready mix plant. Residential receptors are unlikely to be	Noise may cause annoyance to people working in the local businesses within 300m of the site.	**Low - provided management procedures adhered to**

			• Avoiding un-necessary revving of engines, engines switched off when not in use or idle for long durations. • Use of broadband type noise reverse alarms (i.e. non-beeper type) • Minimisation of drop heights during tipping; • Local industries nearby include a cement factory and vehicle dismantling workshop – these industries are inherently noisy operations and working on site unlikely to be impacted by noise operations from the site as baseline noise levels are established. • Noise Impact Assessment undertaken by Spire Environmental (document ref: R20.1365-2-AG) concluded that the proposed STF and asbestos operations at the site would not result in any additional noise that would be above the existing planning permissions noise conditions at site. The STF plant does not increase the overall noise levels during landfill operations. Noise is also not expected to be significant during the construction phase. Further noise control and mitigation measures are detail within the Noise Impact Assessment.	affected at >200m distance.		

Table 4: Fugitive emissions risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
			DUST			
Dust from contaminated soil treatment Dust from storage of hazardous storage	Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air - wind borne dust.	Preventative measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply and dust suppression by regular spraying in dry conditions; • Waste acceptance procedures to ensure soils that have the potential for dust emissions are not accepted • Dust suppression cannon/system with added asbestos surfactant; • Asbestos monitoring will be carried out quarterly against background reference levels determined with on site monitoring as a pre-commencement condition; • use of clean water for dust suppression, to avoid re-circulating fine material;	**Low** Emissions Management Plan in place under document ref: 3982-CAU-XX-XX-RP-V-0307. Dust emissions are transient in nature and likely to dissipate before settling Nearest residential receptors unlikely	Nuisance - dust on cars, clothing etc.	**Low - provided management procedures adhered to**

			• high standards of house-keeping to minimise track-out and windblown dust; • a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment; • minimisation of drop heights during tipping; • clear delineation of stockpiles to deter vehicles from running over edges; and • effective staff training in respect of the causes and prevention of dust. • Daily dust monitoring carried out to assess levels of emissions from site activities. • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site. **Specific measures** in relation to activities within the treatment facility include: • Misting equipment to be employed if required during summer months Meteorological conditions should be considered before activities such as transfer, and this activity should be minimised during unfavourable wind conditions.	to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. In addition, background dust from external sources at the Retford Concrete Plant, is likely to impact on Travellers site due to close distance. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors		

Pre-screening of asbestos soils Handpicking of asbestos soils	Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Wind – airborne asbestos fibres and inhalation	Preventative measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply by regular spraying in dry conditions with added asbestos surfactant; • Dust suppression cannon/system • Asbestos monitoring will be carried out quarterly against background reference levels determined with onsite monitoring as a pre-commencement condition; • For occupational exposure, daily asbestos monitoring will be carried out during soil screening operations. (See 'Section 8 Monitoring' in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307. • Use of clean water for suppression, to avoid re-circulating fine material; • Minimisation of drop heights during tipping; • Hand-picking operations are carried out in a fully enclosed picking station; • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site.	**Low** Emissions Management Plan in place under document ref: 3982-CAU-XX-XX-RP-V-0307. Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors	Asbestos linked illness	**Low - provided management procedures adhered to**

To Water						
Runoff from site surfacing directly into surface water.	Surface waters downstream of site	Surface water drainage system	The site's treatment areas comprise impermeable pads and sealed drainage which is pumped to holding tanks (disposed of to an appropriate and permitted facility)	**Unlikely** given the treatment plant which is in place. (Accidental spillages are dealt with in Table 5).	Contamination of local surface water.	**Low - provided management procedures adhered to**
Contaminated run-off percolating through ground.	Groundwater or surface waters close to the site	Migration through site surfacing and underlying soil.	Measures to control contaminated runoff into ground will include: • Offloading of soils to be supervised by suitably trained staff who will be aware of storage requirements for various wastes. • Daily site inspections will include checks to see that soils are stored in their designated storage areas. • All areas used for storage or handling of soils that may have contaminated runoff will be on impermeable pads which drain to sealed drainage sumps, containing any run-off. • Regular inspections of impermeable ground: Any damage detected that could impair the integrity of the pad should be recorded and repairs carried out as soon as possible. • All storage areas are bunded to contain run-off which drains into the network into the holding tanks.	**Unlikely**. The areas of the site used for soil activities are located on impermeable pads which drain to sealed drainage sumps.	Contamination of groundwater and surface water.	**Very low**
Pests						
Rodents/ pests	Workers and visitors to site, nearby agricultural land.	Over ground.	Unlikely due to nature of wastes accepted Measures taken to prevent infestation: • Daily site inspections will monitor for the presence of rats/pests on site.	**Unlikely** However, with any kind of biodegradable waste, occasionally	General nuisance and health risk from rats being vectors for human	**Low provided management procedures adhered to**

			• Waste acceptance procedures will ensure that non-conforming wastes are rejected. • Soils unlikely to attract rodents if strict waste acceptance procedures adhered to. • In general, good housekeeping with regular sweeping and clearing of waste areas is encouraged. Actions in the event of rodents/pests being detected at the site: - • The incident must be reported to the site manager; • A record must be made of the incident and actions taken; • Waste acceptance and storage procedures should be reviewed; and • Specialist pest control contractor will visit site regularly and on an ad hoc basis.	rats/s can be present, but the types of wastes are unlikely to result in rats/pests being a significant problem.	pathogens (e.g. weil's disease).	
Flies breeding in in soils treatment facility.	Workers and visitors to site. Residential receptors > 200 m from site and travellers site.	Air	Unlikely due to nature of wastes accepted Measures taken to prevent infestation: • Waste acceptance procedures will ensure that non-conforming wastes are rejected. • Daily site inspections will monitor for the presence of flies on site. • In general, good housekeeping with regular sweeping and clearing of waste areas is encouraged. Actions in the event of a fly infestation being detected at the site: - • The incident must be reported to the site manager; • A record must be made of the incident and actions taken;	**Fairly Unlikely** Significant flies are not anticipated	General nuisance	**Low - provided management procedures adhered to**

			• Waste acceptance and storage procedures should be reviewed; and In the event of severe infestations, the specialist pest control contractor will visit more regularly and on an ad hoc basis.			
			Mud/Litter			
Litter from off-loading and processing of mixed loads including possibility of some light wastes.	Workers and visitors to industrial estate. Sensitive Receptors dwelling at nearby Travellers Site.	Air - via wind.	Measures taken to prevent litter leaving the site: • Waste acceptance procedures to ensure the acceptance of only approved waste. Actions in the event of litter being detected leaving the site: - • Litter picking will be carried out. Priority is given to clearing any litter outside the permit boundary furthest away and working inwards. • The incident must be reported to the site manager. • A record must be made of the incident and actions taken. • Waste acceptance, storage and treatment procedures should be reviewed, and additional control imposed as deemed necessary by the site manager.	**Unlikely** Litter may be identified from time to time but likely to be in relatively small quantities and only problematic during high winds.	Nuisance to nearby receptors.	**Low - provided management procedures adhered to**
Mud being tracked onto surrounding roads.	Workers and visitors to site and users of surrounding roads	Tracking on vehicle tyres entering/leaving the site.	Measures taken to prevent mud leaving the site: • Roads and site areas will be regularly inspected/swept. • Drivers will be encouraged to ensure their vehicle tyres are clean before leaving site and that any loose material is in enclosed containers or the loads are sheeted or netted. • Daily site inspections will monitor for mud or debris being tracked from the site.	**Unlikely** Mud and debris may be tracked onto surrounding roads.	Nuisance to nearby road users In severe circumstances, mud on the road could affect road safety.	**Low - provided management procedures adhered to.**

			• In general, good housekeeping with regular sweeping and clearing of debris is encouraged. • Road sweeper can be hired in as necessary. Actions in the event of mud and debris is being tracked onto roads outside the site: - • Affected road areas will be swept. • The incident must be reported to the site manager. • A record must be made of the incident and actions taken.			

Table 5: Accidents risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Spillage or leak of fuel or other hazardous liquids.	Underlying soil, Groundwater and/or Surface water.	Through site surfacing and ground.	Fuel and various liquid products used in equipment or vehicle maintenance may have hazardous properties. These could leak during storage or spillages could occur during use. **Preventative measures**: • The soil bioremediation operation and associated activities take place on impermeable surfacing with drainage to holding tanks. • The site surfacing will be bunded to ensure that any leaks are contained within the facility. • All fuels and tanks will be appropriately stored and bunded. • Regular inspections to check for integrity of site surfacing and correct storage of any hazardous liquids e.g. fuel for mobile plant. • All staff involved in soils handling will be inducted in the emergency procedures regarding the handling of spills.	**Unlikely** Impermeable pads will prevent migration of spills or leakages to underlying ground. In the event of any uncontained spill, the drainage system will collect any oil spillages and other hazardous liquids would be collected by the drainage system. On that basis, it is very unlikely that any	Contamination of local water course or underlying ground or groundwater.	**Low - provided management procedures adhered to.**

			Actions in the event of spillages: • Incidents to be managed in accordance with emergency procedures regarding the handling of spills. • Spillages will be contained using appropriate spill kits or absorbent materials (e.g. soils). • Depending on the severity of the spill, the Environment Agency will be contacted. The emergency procedure includes incident reporting and, as part of the environmental management system, incidents will be reviewed by management on a regular basis.	spills would reach water courses or groundwater.		
Fire in processing areas.	Surface water receiving contaminated fire waters. Surrounding site facilities. Air.	Air Ground.	Unlikely for fires to occur on waste piles due to the nature of the waste itself. Fires could occur as a result of arson, from sources of ignition, or from electrical faults on site. Unlikely for contaminated fire waters to enter surface/groundwater water environment as the site will be served with impermeable surfacing which will be kerbed and provided with sealed drainage pumped to site holding tanks. **Preventative measures**: • No smoking policy. • Emergency vehicles will be able to gain access to all operational areas. • All staff involved in soil handling will be inducted in the emergency procedures	Even with measures in place to prevent the occurrence of fires, it is possible that fires could break out. However, measures in place to prevent the fire spreading or to limit its consequences will significantly reduce the probability of receptors being affected by a fire.	Smoke, local nuisance, risk of fire spreading to other areas or properties.	**Low - as long as management procedures adhered to.**

			including the fire action plan and a regular fire drill. • Daily checks and emergency procedures in place to prevent fire risk. • Site staff trained in fire risk and how to deal with an incident on site. • Any visitors to the site will be inducted and be made aware of the fire risks. • **Actions** in the event of fire: • Where it is safe to do so, site staff will use on-site fire-fighting equipment to extinguish fires. • Where a fire may have been caused by electricity or is close to electrical equipment, electricity to that area should be switched off and isolated. • Clear directions will be given to the fire service and a member of staff will wait at the entrance to the site to direct the service to the site on arrival, to ensure that the speediest service is provided. • A list of actions is outlined in the Fire Prevention Plan and associated Fire Risk Assessment The emergency procedure includes incident reporting. As part of the environmental management system, incidents will be reviewed by management on a regular basis to identify whether lessons can be learnt, and procedures improved.			

Flooding	Underlying soil. Groundwater. Surface water.	Flood water. Drainage systems.	**Preventative measures**: • Materials with hazardous properties (e.g. fuel) are contained and unlikely to leak as a result of partial submersion. • Flood Risk Assessment, document ref: 3982-CAU-XX-XX-RP-C-0300 indicates that the site is not at risk of flooding. **Actions** in the event of flooding: • In the event of flood warnings for the area, the site manager or technically competent manager should consider the possibilities of moving waste materials or any other materials with hazardous properties • Where flooding could reach areas where electrical equipment is used, electricity to that area should be switched off and isolated. • After flood waters have receded, the areas outside the site should be inspected and any materials which have escaped the boundary should be picked up.	**Unlikely.** None of operational area of the site is deemed to within flood zone1. [1] (low risk of flooding)	Contamination of surface waters or surrounding areas with soil materials could, depending on the properties of the soils (hydrocarbon content), affect water quality or be unsightly.	**Low.**
Soils treatment process failure, material becoming anaerobic and giving rise to odours	Local human population	Air transport, then inhalation	Preventative measures will include: • Good management of the treatment process, i.e. good mixing, aeration and regular monitoring, experienced and competent staff. In the event of failure of the treatment process:	**Unlikely,** the likelihood of soils becoming anaerobic is low.	Odour nuisance.	**low**

[1] Daneshill Landfill Soil Treatment Facility Flood Risk Assessment November 2019, 3982-CAU-XX-XX-RP-C-0300.

			• If material has become anaerobic and malodorous, the material may be covered with more soils to minimise odour and, if required, the removal of the failed material to landfill.			

3.1.1 The risk assessments above enable identification of appropriate mitigation measures to control the amenity and accident risks from the activities in relation to the proposed contaminated soils treatment facility. All identified risk mitigation measures will be incorporated within the management system for the site.

3.1.2 The amenity and accident risk assessment indicate that provided the identified risk mitigation measures (as identified in the tables above) are implemented, the risk of nuisance or pollution from fugitive emissions or accidents is low and will not present a significant impact on nearby receptors.

1. GOV.UK Guidance 'Risk assessments for your environmental permit' Updated 10th January 2019 – replaces previous: Environment Agency (2010): How to comply with your environmental permit. Additional guidance for: Horizontal Guidance Note H1 - Annex (a).

Drawings

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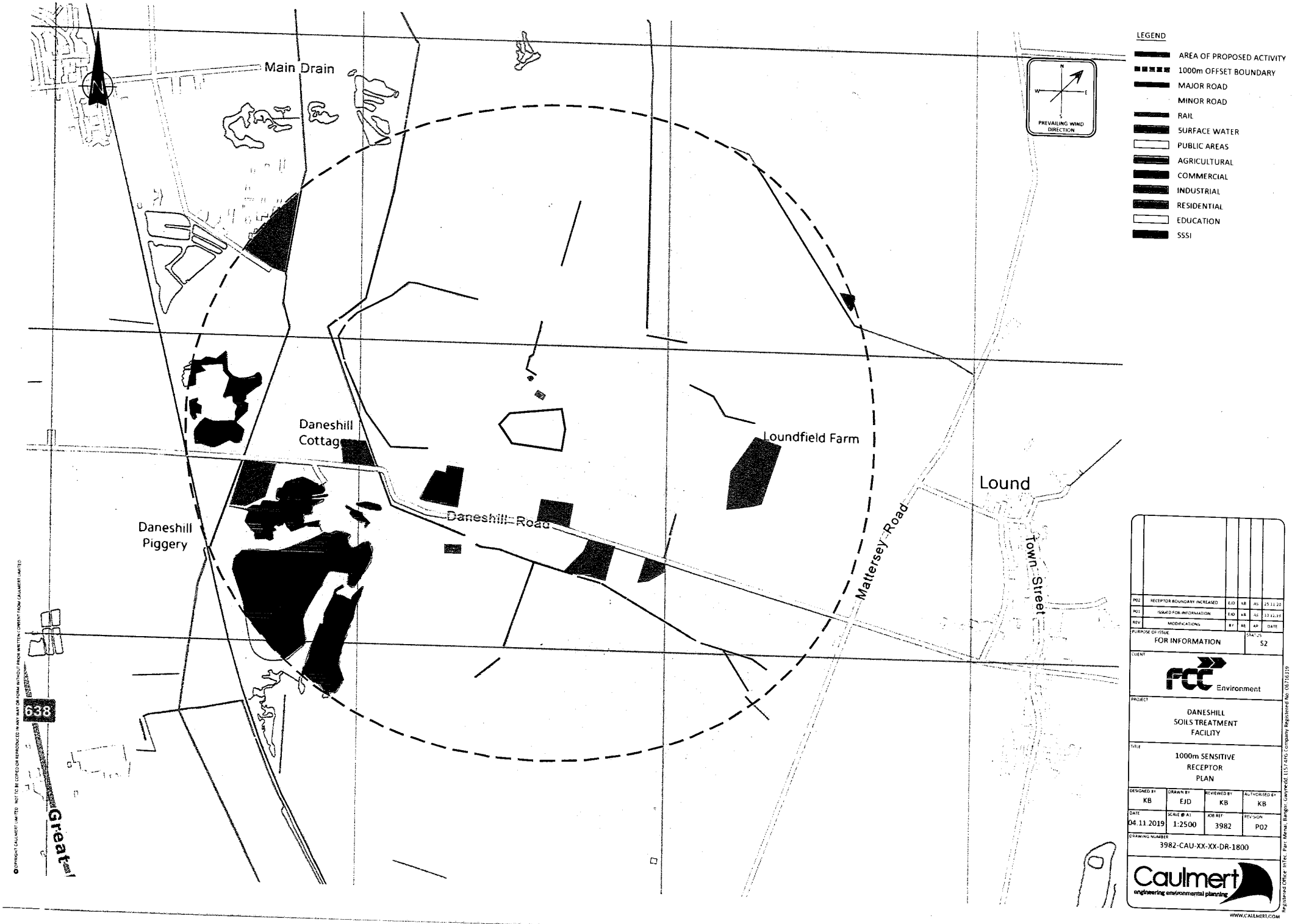
Main Drain
Daneshill Cottage
Loundfield Farm
Daneshill Piggery
Daneshill Road
Mattersey Road
Lound
Town Street
638
Great
LEGEND
AREA OF PROPOSED ACTIVITY
1000m OFFSET BOUNDARY
MAJOR ROAD
MINOR ROAD
RAIL
SURFACE WATER
PUBLIC AREAS
AGRICULTURAL
COMMERCIAL
INDUSTRIAL
RESIDENTIAL
EDUCATION
SSSI
PREVAILING WIND DIRECTION
P02 RECEPTOR BOUNDARY INCREASED EJD KB AS 25.11.20
P01 ISSUED FOR INFORMATION EJD KB AS 13.11.19
REV MODIFICATIONS BY RS AP DATE
PURPOSE OF ISSUE FOR INFORMATION
STATUS S2
CLIENT FCC Environment
PROJECT DANESHILL SOILS TREATMENT FACILITY
TITLE 1000m SENSITIVE RECEPTOR PLAN
DESIGNED BY KB
DRAWN BY EJD
REVIEWED BY KB
AUTHORISED BY KB
DATE 04.11.2019
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JOB REF 3982
REVISION P02
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Environmental Setting and Installation Design
Site Report Addendum
January 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Environmental Setting and Installation Design Site Report Addendum

Environmental Permit Variation Application

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January 2021

Caulmert
engineering environmental planning

APPROVAL RECORD

Site:	Daneshill Landfill Site
Client:	FCC Environment Ltd
Project Title:	Daneshill Soils Treatment Facility
Document Title:	Environmental Setting and Installation Design - Addendum
Document Ref:	3982-CAU-XX-XX-RP-V-0304-A0.C1
Report Status:	**Final**
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Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

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APPENDICES

DRAWINGS

1.1 Report Context

1.1.1 This report is intended as an addendum to the existing Environmental Setting and Installation Design (ESID) report produced by SLR (SLR Ref.: 4C-197-219/ESID) to support the further development of the Daneshill Landfill Site.

1.1.2 The addendum reflects proposed changes at the site which consists of a soil treatment facility (STF) on a newly constructed compost pad provided with sealed drainage.

1.1.3 The operator proposes to treat a total 29,999 tonnes per annum of hazardous soil at their STF facility and 20,001 of non-hazardous soils which will comprise of biopile remediation, screening and hand-picking of asbestos contaminated soils. The treated soils will be used for the restoration of the wider Daneshill Landfill site. It is anticipated that treatment durations are typically between 8-16 weeks, with the maximum treatment time being 6 months.

1.1.4 STF operations will be situated on a newly constructed treatment pad with an impermeable cover within the footprint of the Daneshill Landfill Site, the location as shown in drawing 3982-CAU-XX-XX-DR-V-1801. Due to condition and integrity, the former concrete pad will be excavated, a GCL layer will be placed down with drainage surrounded by crushed stone and crushed concrete on top. Drainage will ensure that no liquid will run off the pavement other than via the site system, all liquids entering the system shall be collected and pumped to onsite holding tanks. As there is no surface water or foul water drainage on site, all liquids will be held in a storage tank and then tankered for appropriate disposal.

1.2 Template for Site Condition Reports

1.2.1 The EA guidance on Site Condition Reports (horizontal guidance note H5) sets out the requirements to prepare and maintain a site condition report for facilities that are regulated under the Environmental Permitting Regulations over the lifetime of the Site.

1.2.2 A Site Condition Report template is provided within the guidance. The template is divided into sections to be completed at different life stages of the regulated facility:

Sections 1-3 to be completed and submitted with applications for new facilities: This should include a description of the condition of the land at permit issue and a description of permitted activities at the site.

Sections 4-7 to be maintained during the life of the site: This should include a description of any changes to the activities and any changes to the use or production of dangerous substances at the facility. It should also include records of inspections for all pollution prevention measures, pollution incidents that may have had an impact on land and environmental monitoring.

Sections 8-10 to be completed and submitted with surrender applications: This should include a description of site decommissioning and removal of pollution risk and, where relevant, reference data and details of any remediation. Finally, it should include a 'statement of site condition' that is based on the information provided in the previous sections of the report.

1.2.3 To support the permit application to extend the permitted area, sections 1 to 3 of the Environment Agency's Site Condition Report Template is addressed below. The text in *italics* is copied from the template as this is the Environment Agency guidance on what should be included.

1.3 Site Details

1.3.1 The details of the operator and the site are as follows:

Name of the Operator	FCC Recycling (UK) Limited
Activity Address	Daneshill Landfill Site Daneshill Road Loud Nottinghamshire DN22 8RB
National Grid Reference	SK 6755086750

1.3.2 In the context of this report, 'site' refers to all of the land within the proposed permit boundary.

1.3.3 The site will consist of a hazardous and non-hazardous soils treatment facility, the proposed design has 2 x treatment areas for biotreatment and physical screening/hand picking on treatment pads measuring at 3450m^2 and 3500m^2 as well as a separate screening/hand picking area of 4880m^2. The proposed site boundary and treatment layout can be seen in drawing ref: 3982-CAU-XX-XX-DR-V-1805 'Proposed Site Layout Plan' presented within the application. The drawing also offers indicative locations for site infrastructure including access roads, biofilter, site office, weighbridge and the direction of drainage flow.

1.4 Site Plans

(Note: In Part A of the application form you must give us details of the site's location and provide us with a site plan. We need a detailed site plan (or plans) showing:

- *Site location, the area covered by the site condition report, and the location and nature of the activities and/or waste facilities on the site.*
- *Locations of receptors, sources of emissions/releases, and monitoring points.*
- *Site drainage.*
- *Site surfacing*

If this information is not shown on the site plan required by Part A of the application form then you should submit the additional plan or plans with this site condition report.)

1.4.1 Site plans showing details of the site and its surroundings are included as part of the application for the facility. The list of drawings included in this application is provided in the table below.

Drawing number	Drawing title
3982-CAU-XX-XX-DR-V-1800	Sensitive Receptors Plan
3982-CAU-XX-XX-DR-V-1801	Site Location Plan
3982-CAU-XX-XX-DR-V-1802	Odour Monitoring Plan
3982-CAU-XX-XX-DR-V-1803	Dust & Abestos Monitoring Plan
3982-CAU-XX-XX-DR-V-1804	Site Boundary Plan
3982-CAU-XX-XX-DR-V-1805	Proposed Site Layout Plan
3982-CAU-XX-XX-DR-V-1806	Section Drawings

1.4.2 The proposed Soil Treatment Facility site is located within the footprint of Daneshill Landfill Centred which is located approximately 2km east of Lound Village, 6km north-west of Retford and 11km north east from Worksop.

1.4.3 The site is bordered to the north and east by agricultural land and mixed woodland and to the west. South-west are nature reserves and the Daneshill Lakes. The nearest residential dwelling to the site is Daneshill Cottages which lies approximately 75m to the south-west of the site and Loundfield Farm 200m east of the site.

1.4.4 The proposed location of the STF will fall within the current permit boundary of Daneshill Landfill Site, therefore this application is not seeking to extend the permit boundary. The STF shall sit within the southern part of Daneshill Landfill Site development as shown on drawing 3982-CAU-XX-XX-DR-V-1804.

1.4.5 The facility will be limited to accepting wastes that can be treated to a point where they can be used for restoration soils on the landfill in accordance with the approved restoration plan.

1.4.6 The 2004 ESID report details the nearby receptors of the landfill which have been updated within this application to reflect the addition of the STF to the site (Amenity Accidents 3982-CAU-XX-XX-RP-V-0300).

2. CONDITION OF THE LAND AT PERMIT ISSUE

2.1.1 The pathway and receptor term characterisation within the initial ESID remains valid. These sections included: climate, geology, hydrology, hydrogeology and surface water of which have been summarised below.

2.1.2 No natural geological barriers exist for the wider Daneshill Landfill Site, there are occasional bands of clays and silts, however these do not form a continuous barrier. At the time of the May 2004 ESID report by SLR, Phases 1 and 2 of the site had been landfilled and restored for a number of years, these also includes Cells 1, 2, 3, 4, & 5. Cells 6, 7, 8a and 8b were capped and partially restored in 2003, Cell 9B was constructed in 2003 and was currently operational, Cell 9a was planned to be constructed in 2005, with the remaining

cells to be constructed in future years. The Soils Treatment Facility falls under Cells 11 and 12 of the Daneshill Landfill Site, both these cells were destined for landfilling as per the May 2004 ESID 2 'Environmental Site Setting' drawing, however operations did not commence within these cells. These areas are currently unused for any site or storage activities.

2.2 Solid Geology

2.2.1 The proposed Soil Treatment Facility is underlain by drift deposits overlying the Nottingham Castle Formation of the Sherwood Sandstone Group, a review from BGS online mapping portal indicates there are no superficial deposits in the proposed STF area.

2.2.2 The Sherwood Sandstone is underlain by Permian units and the Carboniferous Coal Measures, these have been written in further detail within the 2004 ESID report and remain valid for the STF area. The Sherwood Sandstone consists of approximately 140m of Nottingham Castel Formation and 20m of Lenton Sandstone formation in the vicinity of the site. The Permian Strata comprises of approximately 120m of mudstones, sandstone, dolomitic limestones and breccia. The Carboniferous Coal Measures unconformably underlie the Permo-Triassic strata with a thickness range from 900m to 1300m

2.3 Drift Geology

2.3.1 The STF area is noted to be underlain by First Terrace sand and gravels associated with the River Idle which flows to the east of the site. It is understood that these deposits have also been worked from the western part of the Daneshill site, exposing the underlying Sherwood Sandstone. The First Terrace deposits consists of sands and gravel associated with the River Idle and are of varying and inconsistence thickness. Regionally the Permo-Triassic geological strata dip gently to the east, with successively older deposits outcropping in a westerly direction. The Carboniferous strata are folded and dip gently to the east and west.

2.4 Man-made subsurface pathways

2.4.1 Due to its historic industrial uses of the site, it is anticipated there could be a number of underground utilities including gas, water, electricity services. However, given the nature of the concrete surfacing and its previous land-use with no sealed drainage, it is considered that the proposed STF area is not served with any man-made subsurface pathways.

2.4.2 A review of the 'Site Layout and Waste Deposition' drawing ref ESID 4 from the May 2004 ESID report indicates that there are no sub-surface drains or underground services within Cells 11 and 12. At the time of the drawing, a fence line partitioned these cells from 10b and 10a. Bulk storage tanks, wheel wash, quarantine area and the fuel tanks were all stored on impermeable surfacing within Cell 10b and 10a.

2.5 Hydrology and Surface Water

2.5.1 The 2004 ESID report provides valid surface water quality data for the surrounding off-site hydrology at Daneshill Landfill Site. The landfill site is provided with various drainage ditches to control the hydrological regime of the site, these ditches collect run-off from the site and flow westwards towards Daneshill lakes which eventually drains northwards into the River Idle.

2.5.2 The proposed STF area is located within flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. A review on the Environment Agency 'Long term flood risk' mapping portal, indicates that the proposed STF area is:

Flood risk from rivers or the sea – VERY LOW RISK with a chance of flooding of less than 0.1%

Flood risk from surface water – VERY LOW RISK with a chance of flooding of less than 0.1%

Flood risk from reservoirs – VERY LOW RISK with a chance of flooding of less than 0.1%

2.5.3 In terms of surface water and drainage management, as the site has not been provided with any sealed drainage to foul sewer networks, the proposed STF area will be provided with subsurface drainage. The drainage will be collected via holding tanks which will be treated for reuse in the biotreatment and any surplus tankered away for further treatment at an appropriate facility. Clean surface waters which falls on impermeable surfacing will be directed towards the varies drainage detail as described above.

2.5.4 Caulmert were appointed to carry out a Flood Risk Assessment (FRA) on land at Daneshill Landfill site which provides a concept of how the site will collect, treat and discharge surface water. The FRA supported the planning application for the proposed Soil Treatment Facility (STF) development under document ref: 3982-CAU-XX-XX-RP-V-C-0300 ' Daneshill Landfill Site Flood Risk & Drainage Strategy' (November 2019). As part of the risk assessment, fluvial features were identified, the local geology and hydrology and the impact of flooding including; surface water, reservoirs and groundwater. Overall, the FRA determined that the proposed development of the Soil Treatment Facility is classed as a 'Less Vulnerable', however, there are some part of the adjacent site which are at some risk of surface water flooding, this will not impact the development proposed. Existing flood risks such as; drainage, groundwater, overland flow and surface runoff are not consisted to pose a significant flood risk impact to the proposed STF. In terms of climate change, the proposed STF is considered to be at low risk.

2.6 Hydrogeology

2.6.1 The Environment Agency classifies the Sherwood Sandstone group as a Principle Aquifer (previously classed as Major Aquifer). Principle Aquifers SPZ 3 Principle Aquifers provide high levels of water storage and support water supply and/or river base flow on a strategic scale. Groundwater flow and quality from the 2004 ESID report provides valid data

regarding hydrogeological characteristics of the site, mapping and contouring indicates that groundwater flow is in a general northerly direction. Routinely monitored groundwater quality and chemographs from the 2004 ESID report indicates that groundwater was previously impacted by non-landfill contamination sources with elevated concentrations of chloride, which has since declined below the drinking water standards (DWS). At the time of monitoring List I and List II (valid testing regime in 2004) was observed from two boreholes which did not indicate any presence of substances in the groundwater.

2.7 Landfill Gas Monitoring

2.7.1 Landfill gas monitoring was regularly undertaken at Daneshill Landfill Site, Appendix ESID 13 from the 2004 ESID report details a summary of monitoring data since January 2001. It was noted that methane concentration around the vast majority of the site were low, with breaches indicated in Phase 1 and 2 areas which reflects the lack of geomembrane lining system. There are no results for gas monitoring at the proposed STF area, this area was not utilised for landfilling activities, therefore gas monitoring was not a requirement.

Surface waters

2.7.2 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

2.7.3 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

2.7.4 The site is not located within a flood risk zone.

2.8 Sensitive Sites

2.8.1 The Site is centred on national grid reference SK6764786722 within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. A Sensitive Receptor Plan, drawing ref; 3982-CAU-XX-XX-DR-V-1800 details receptors within 500m of the Soil Treatment Facility.

2.8.2 The proposed STF site is in a predominantly agricultural setting of which Loundfield Farm is located 500m to the east. Other nearby residential and domestic dwellings include a few properties and a travellers site located on Daneshill Road. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

2.8.3 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

2.8.4 A review of the prevailing wind direction has identified that the most dominant wind is from the south-west/south-south-west towards north-east/north-north-east. The wind direction is likely to blow towards Mattersey Village and agricultural fields. Given the distance from the site boundary and the transient nature of odours from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

2.8.5 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

2.8.6 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

2.8.7 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

2.8.8 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Travellers Site	Residential	155m	SWS
Daneshill Road	Public road	250-500m	S, W, SW
Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

2.8.9 The closest SSSI is Groby's Flash. It is understood that these flashes are the result of subsidence caused by natural or anthropogenic halite dissolution at depth and it is further understood that water within these flashes ranges from fresh to saline due to the present of saline springs in some pools. There is no evidence of any such springs in the immediate vicinity of the site. To the east of the site, two small, enclosed pools are located east of the railway line.

3 SOURCE TERM CHARACTERISATION

3.1.1 The source term characterisation details provided in the 2004 ESID for the landfill remain valid, no activities relating to the permit were carried out on the proposed STF area. During the May 2004 ESID report, Cells 11 and 12 (proposed STF) were proposed for landfill operations, however this did not commence. The site was historically agricultural land prior to it being developed as a Royal Ordnance Munitions factory until its closure in the 1970's. The site was acquired by Nottinghamshire County Council (NCC) and the factory was demolished.

3.1.2 The STF will treat hazardous soils prior to enabling their use as restoration materials for the landfill. Contaminants within the waste soils are organic and will predominantly comprise (but not be limited to) the following:

- a range of petroleum hydrocarbons (e.g. petrol, heating fuel, diesel, used oils crude oil)
- polycyclic aromatic hydrocarbons (PAH's)
- creosote
- phenols and
- chlorinated solvents and other volatile organic compounds
- Visible bound asbestos debris suitable for removal by hand picking

3.2 Pollution History

3.2.1 From a review of previous reports and operational records, it is concluded that there have been no historical incidents which may have given rise to any significant land pollution. There are no CAR reports or improvement conditions which have indicated a contamination pollution event within the vicinity of the site.

3.3 Historic land-uses

3.3.1 Historical activities on site were summarised in the 2004 ESID site condition report (Appendix 2) for the wider Daneshill Landfill Site from review of historical ordnance survey mapping.

3.3.2 Prior to any waste activities, the site was previously operated as an Royal Ordnance Factory (ROF) munitions factory, where the site was eventually decommissioned and ownership transferred in the 1970's and 1980s. The Ranskill factory was a United Kingdom Ministry of

Supply, World War II explosive ROF which was built to manufacture cordite, producing 300tons of cordite per week. Codite production ceased in 1945, but the site was retained by the ministry on a "care and maintenance" basis for a further 30 years. A Research Department Explosive (RDX) plant was installed in the 1950s, which is an explosive widely used in military and industrial application. The production plant at ROF Ranskill was eventually broken up from the 1975 with useful spares from the RDF plant sent across to the ROF Bridgewater before the site was handler over to become the Defence Estates for disposal

3.3.3 The Nottingham County Council website did not indicate any references to contaminated land at the Daneshill ROF at Ranskill, there are no available records to identify any demolition and subsequent restoration/remedial works undertaken. The site was confirmed by Basset District Council 'not designated as contaminated'.

3.3.4 The historic land uses have been summarised below:

Date	Description	Source
Within the footprint of the Daneshill Landfill Site		
1921	Land use agricultural with drain on wester perimeter of site	OS County Series, 1:2,500 scale and 1:10,560
1939	Royal Ordnance Factory Ranskill created by Ministry of Works to produced explosive chargers and propellants for World War II on location of proposed Soil Treatment Facility.	Ranskill.org.uk
1948	Railway network, tracks and buildings encroaching on wider site. Area still predominantly agricultural.	OS County Series, 1:10,560 scale
1956	Marshy ground in northern corner of site	OS Plan (1:10,560)
1964	No change since previous mapping	OS Plan (1:2,500)
1969	North and western corners of site mapped as marsh and woodlands	OS Plan (1:10:560)
1970	Evidence of ROF munitions factory with a network of several buildings barracks and factory outbuildings.	1970 mapping from ranskill.org.uk
1991	Change in land use in the north eastern part of the wider landfill site development from agricultural to refuse dump	OS Plan (1:10,000)
Land use of surrounding area outside of Daneshill Landfill Site footprint		
1964	Danes Hill including woodland, buildings, Cottages and a Smithy lie on the sites southern perimeter. South of Danes Hill a pump is present. The Great Northern Railway runs along the west perimeter of the site.	OS County Series, (1:2,500) and (1:10,560)
1948	Predominantly agricultural land. The development of the area north west of the site along the railway line, Globe Fork Works and other buildings. Tanks and development of the area east of the site.	OS County Series, (10,560)

	A sheepwash is present south of the site. A gravel pit is located north of the site and Mattersey Hill Moises Plantations.	
1956	The gravel pit has expanded to the north west of the site. Agricultural land changed to woodland. Loundfield farm borders the eastern edge of the site.	OS Plan (1:10,560)
1964	No change	OS Plan (1:2,500)
1969	Lakes present to the west of the site and marshland between the site and the railway line. Sand and gravel quarry is an active works to the north. In the north east is the Mattersey and sand quarry along with the Antcliff Plantation.	OS Plan(1:10,560)
1991	South west of the site is Danes Hill lake (Nature Reserve) and Bird Sanctuary. The Mattersey quarry north of the site is now disused. Timber yard located to the north west of the site. Danes Hill buildings south of the site are no longer present.	OS Plan(1:10,000)

3.4 Evidence of existing or historic contamination

3.4.1 The 2004 ESID report carried out a reconnaissance of the wider Daneshill Landfill area, in particular to the non-landfill areas and facilities that have potential to create pollution findings are summarised below:

Storage tanks - No evidence of cracks or spillages evident e.g. staining or breaks in tank walls. Stored on impermeable surfacing on Cell 10b, not within the proposed area for STF.

Hardstanding and bunded areas – Hardstanding areas laid to fall towards an interceptor, no evidence of surface cracks or any other damage. No polluting substances handled outside of hardstanding areas.

Surface Water features – No evidence of discolouration, surface films, turbidity, or odour which would suggest possible contamination.

Surface water, drainage and foul drainage – Drainage around vehicle refuelling areas discharges via interceptors. Surface water discharges via soakaway/interceptor.

3.4.2 Findings from the WRG 2004 ESID report did not observe any visual evidence of significant pollution to the site.

3.4.3 In addition, a site visit was carried out in February 2019 by a Caulmert Environmental Consultant. The existing site as well as the immediate surroundings were inspected.

3.4.4 A Site Inspection Record is provided in Appendix 1 which includes photographic evidence of the current condition of the site of the proposed operations.

3.5 Baseline soil and groundwater reference data

3.5.1 The proposed STF area was previously used as a munitions factory, since its decommissioning, no landfilling or waste activities were carried out. At the time of the May 2004 ESID, the site was proposed for landfill operations, however these activities did not commence. The area was provided with impermeable surfacing without a sealed drainage system. Due to the many years of wear & tear since the munitions, the site surfacing shows many areas of cracks and breakages, therefore, the integrity of the concrete surfacing cannot be fully established. Based on the site inspection, the platform of the site will be redeveloped by use of subsurface drainage, a GCL layer and impermeable surfacing for the proposed STF activity.

3.5.2 A review of the 2004 ESID report identified that there have been no past pollution incidents or spillages within the wider Daneshill Site. Given the nature of historic activities, it is considered that there is little likelihood that land pollution occurred in the non-landfilling areas, therefore further intrusive monitoring of the site is not required.

4. PERMITTED ACTIVITY

Permitted activities

4.1.1 Daneshill Landfill Site is currently permitted under EPR/NP3538MF and operated by FCC Recycling (UK) Ltd. Other permitted activities included the treatment of soils under Standard Rules permit SR2010No12 'Treatment of waste to produce soil, soil substitutes and aggregate' which allows the operator to store and treat wastes (excluding hazardous' not exceeding 75,000 tonnes per year. In addition, the storage and recycling of fridge freezers were carried out.

4.1.2 The permit variation is to include a Soil Treatment Facility on the former aggregates recycling pad within the landfill site boundary and to handle 29,999 tonnes per annum of hazardous soils and 20,001 tonnes of non-hazardous soils over a 10-year period. The treated soils will be primarily used in the restoration of the landfill site. The treatment areas consist of 2 treatment pads measuring at 3450m2 and 3500m2 for biotreatment/physical treatment and another 1 x 48800m2 treatment pad solely for screening/processing.

4.1.3 The activities that will take place include the biological waste treatment of hazardous soils with the temporary storage of hazardous waste whilst formal acceptance analysis is conducted. Non-hazardous soils will be screened to remove oversize inclusions prior to reuse after validation testing is complete. Visible bound asbestos will be segregated by screener and a handpicking line. Soils to be accepted are outlined in the supporting document.

4.1.4 The STF will incorporate a biofilter as part of the treatment process to treat air that has been extracted from hydrocarbon impacted soils. In addition, a water treatment system is

shown that allows for temporary water storage and treatment prior to any disposal off-site or reuse in the biotreatment works.

Plan showing activity layout

4.1.5 The proposed boundary and activity layout and drainage detail is shown on drawing ref: 3982-CAU-XX-XX-DR-V-1805 'Proposed Site Layout Plan'.

Environmental risk assessment

4.1.6 An environmental risk assessment has been carried out to support the permit application; this is presented separately within the *'Amenity and Accident Risk Assessment'* (document reference 3982-CAU-XX-XX-RP-V-0303). This report is based on Environment Agency guidance and assesses the potential risks from odour, noise, fugitive emissions and accidents.

4.1.7 The risk assessment identifies risk mitigation measures such as infrastructure, equipment or operational practices that are required to manage the risks from the site. Identified mitigation measures are incorporated as part of the management measures for the Site. The identified activities that will be conducted at the site which may lead to land pollution along with the identified preventative measures that are needed to be in place to protect the land are presented within 'Fugitive emissions' and 'Accidents' tables of the above report.

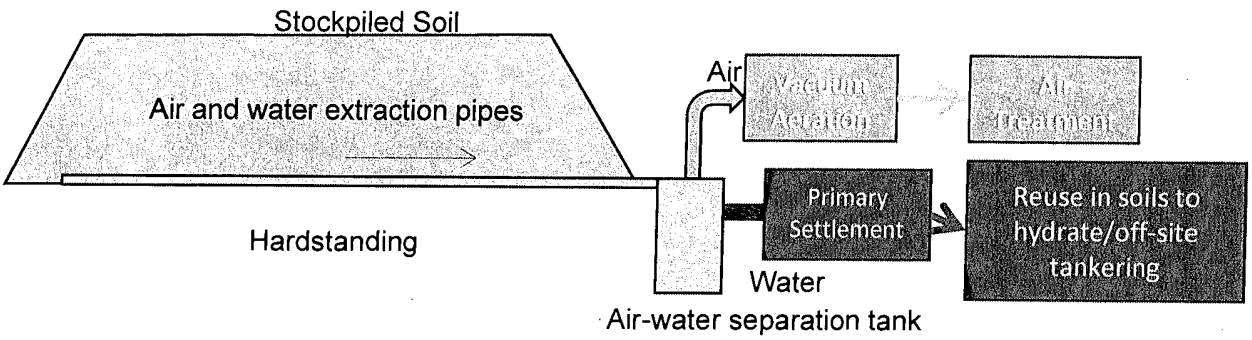
4.2 Proposed Operations

4.2.1 The treatment of 29,999 of hazardous soils and 20,0001 tonnes of non-hazardous soils per annum is proposed at Daneshill Soil Treatment Facility. The usual maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks. Treatment will consist of bioremediation with a screening and hand picking line for the removal of oversize inclusions and asbestos fractions.

Bioremediation of Soils

4.2.2 The proposed bioremediation process will utilise industry standard biopile technology and will operate through means of use of biopiles and moisture control, addition of suitable amendments to the soil, forced air extraction to encourage micro-organism growth and breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. The process is detailed in Figure 1 below.

Figure 1: Bioremediation process proposed at Daneshill Soils Treatment Facility



4.2.3 Prior to any requirement for biotreatment, soils containing any hydrocarbons will be inspected for any visible bound asbestos. If present, soils will undergo pre-acceptance testing to confirm that the asbestos fibre content is lower than 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Upon satisfactory receipt of pre-acceptance results, the stockpiles will undergo screening and handpicking to remove the visible asbestos fraction It will then will be moved into the biotreatment phase will be formed into biopiles and placed on water and air extraction pipes. These extraction pipes are connected to a blower that will draw air through the soils where it is then passed through a biofilter before being discharged to air. Excess water draining through the soils will be collected and treated to remove any oils or suspended solids.

4.2.4 This step is not implemented when soils do not contain visible asbestos debris, soils will just be subject to standard reception testing to ensure that the hydrocarbons present are compliant with the initial waste description and are treatable for reuse on the Daneshill landfill.

4.2.5 Standard NPK fertiliser 25:05:05 ratio, typically added initially at 1kg/tonne of soil per application. Occasionally, an organic additive such as woodchip is added, it is anticipated that a maximum of 1,500 tonnes per annum of amendment at ~5% will be added to clayey soils to break up the cohesive nature of the soils and aid aeration.

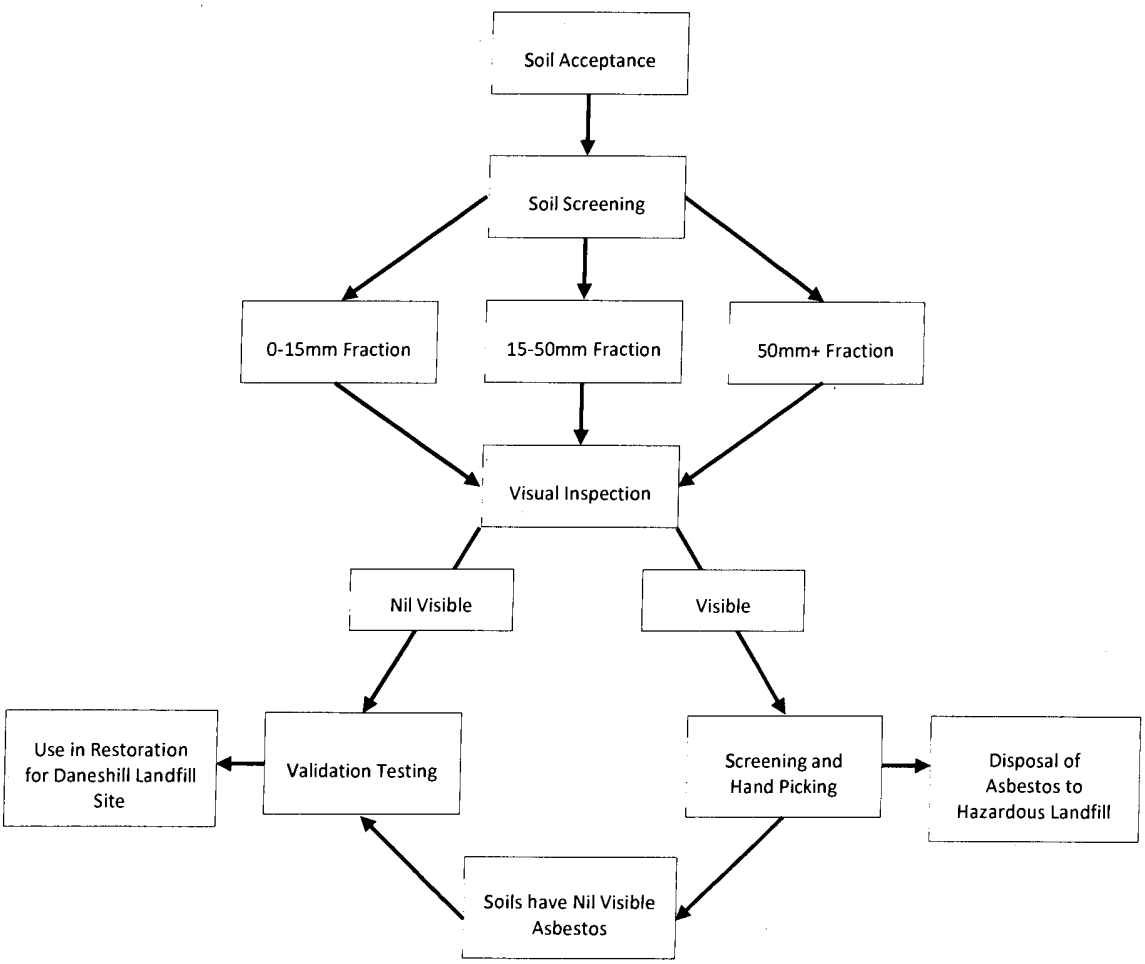
4.2.6 The typical reception/quarantine area is shown on drawing 3982-CAU-XX-XX-DR-V-1805, however the exact layout will vary over time dependent upon inputs and treatment timescales. Demarcation of the areas will be managed via suitable signage and/or barriers.

4.2.7 These activities all take place within separately designated impermeable areas within the proposed permit boundary as shown on drawing ref: 3982-CAU-XX-XX-DR-V-1805 'Proposed Layout Plan'. Drainage systems at the site will lead to sealed sumps and holding tanks which will be treated for reuse in the biopile or tankered off site to an appropriate disposal site. No surface water runoff will be released to the environment.

Asbestos containing soils

4.2.8 The approach is to accept hazardous asbestos impacted soils which can be treated and recovered to soils of a non-hazardous classification. Asbestos containing soils will undergo a number of pre-acceptance conditions, the overall soil treatment approach is detailed in Figure 2 below.

Figure 2: Overall Soil Treatment process at Daneshill Landfill Site



4.2.9 It is not proposed to accept soils that would result in airborne asbestos emissions above the method of detection limit for air sampling, no disposal of hazardous materials within the landfill is proposed.

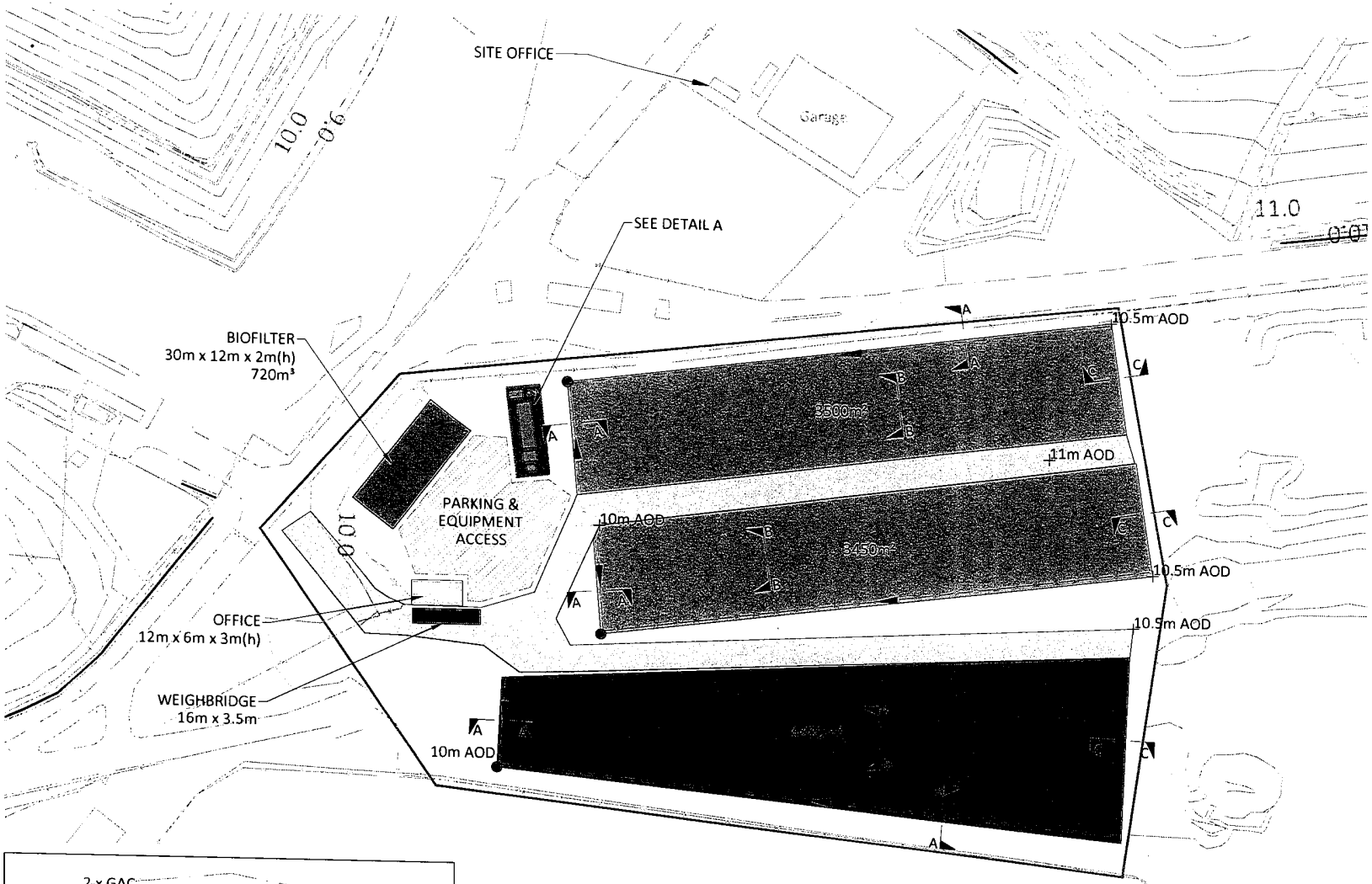
4.2.10 Following acceptance and valid pre-acceptance testing results to confirm chemical validity, non-hazardous soils will be placed into their respective treatment batches and undergo physical treatment. Non-hazardous soils will be screened to remove oversize inclusions prior to reuse to ensure they are physically suitable.

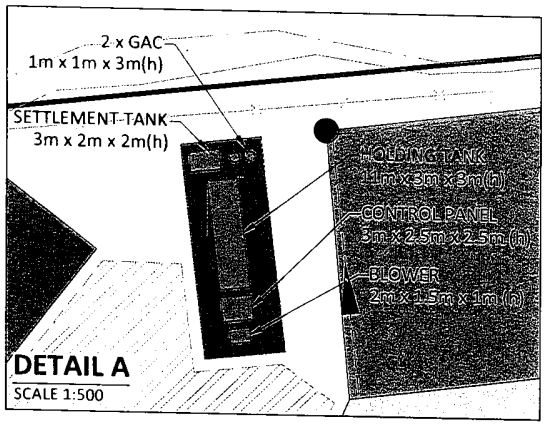
APPENDIX 1

Site Inspection Record

Appendix 2:
ESID Report (SLR, 2004)

Registered Address:
Intec,
Parc Menai,
Bangor
Gwynedd
LL57 4FG





DETAIL A
SCALE 1:500

SITE LAYOUT
SCALE 1:1000

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- SECTION LINES
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING
- ACCESS ROAD
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P2	LEGEND UPDATED	EJD	KB	AS	24.03.20
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: PROPOSED LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF:	REVISION
04.02.2020	AS SHOWN	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1805

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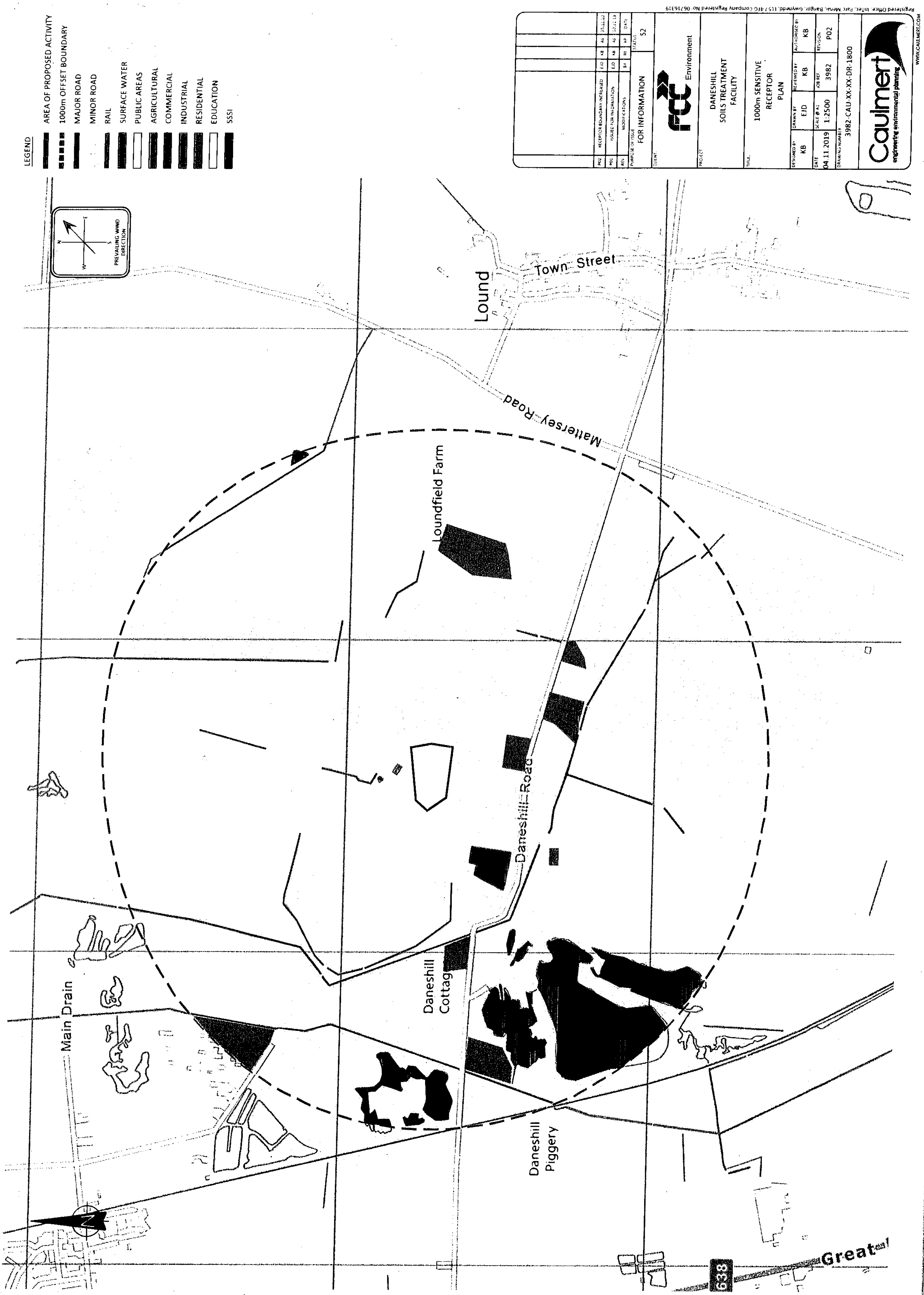
LEGEND
AREA OF PROPOSED ACTIVITY
1000m OFFSET BOUNDARY
MAJOR ROAD
MINOR ROAD
RAIL
SURFACE WATER
PUBLIC AREAS
AGRICULTURAL
COMMERCIAL
INDUSTRIAL
RESIDENTIAL
EDUCATION
SSSI
PREVAILING WIND DIRECTION
Town Street
Lound
Mattersey Road
Loundfield Farm
Daneshill Road
Daneshill Cottag
Main Drain
Daneshill Piggery
Great
638
P02 RECEPTOR BOUNDARY INCREASED EJD KB AS
P01 ISSUED FOR INFORMATION EJD KB AS
REV MODIFICATIONS BY RE AP DATE
PURPOSE OF ISSUE
FOR INFORMATION
STATUS
S2
CLIENT
fcc Environment
PROJECT
DANESHILL SOILS TREATMENT FACILITY
TITLE
1000m SENSITIVE RECEPTOR PLAN
DESIGNED BY KB
DRAWN BY EJD
REVIEWED BY KB
AUTHORISED BY KB
DATE 04.11.2019
SCALE @ A3 1:2500
JOB REF 3982
REVISION P02
DRAWING NUMBER 3982-CAU-XX-XX-DR-1800
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Environmental Permit Variation Application

Treatment Process Description & Indicative BAT Review:
Establishing BAT conclusions for Waste Treatment
Dated July 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Environmental Permit Variation Application

Treatment Process Description & Indicative BAT Review: Establishing BAT conclusions for waste treatment

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July 2021

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engineering environmental planning

APPROVAL RECORD

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Document Title:	Treatment description & indicative BAT review
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Amended	Kellie-Marie P. Burston	**Date**	09/07/2021

DISCLAIMER

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1.1 Background

1.1.1 This report is an assessment of compliance of the proposed new soils treatment facility at Daneshill Landfill in line with 'best available techniques (BAT) conclusions for waste treatment industries (BREF), under Directive 20/10/75/EU, from the Official Journal of the EU.

1.1.2 A general process description for the treatment activities is provided in section 2 of this report.

1.1.3 Indicative BAT standards are laid out in the BAT Conclusions (updated August 2018) for setting permit conditions for installations covered by Chapter II of Directive 2010/75/EU and their set emissions limit values to ensure that under normal operation conditions, emissions do not exceed emissions levels associated the with best available techniques as laid down by the BAT conclusions.

1.1.4 Therefore, the technical standards for this installation have been outlined in section 3 of this report in tables 2.1 to 2.11 with reference to the BAT conclusions for waste treatment industries (BREF), under Directive 20/10/75/EU, from the Official Journal of the EU.

1.2 Principle of Operation

1.2.1 The facility will be limited to accepting wastes that can be treated so that they are suitable for landfill restoration in accordance with the approved restoration plan.

1.2.2 The proposed bioremediation process will utilise industry standard biopile technology and will operate through the use of biopiles and moisture control; addition of suitable nutrients to the soil and forced air extraction to encourage micro-organism growth leading to the breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. Soils will typically be treated over an 8-16-week period, with the material being turned infrequently, typically once every 4-8 weeks. The bioremediation plant will operate continuously. Please refer to Operating Procedures in Appendix 1.

1.2.3 The biopiles will be placed on water and air extraction pipes connected to a blower that will draw air through the soils where it is then passed through a biofilter before being discharged to air. Excess water draining through the soils will be collected and treated to remove any oils or suspended solids.

1.2.4 Standard NPK fertiliser 25:05:05 ratio, typically added at 1kg/tonne of soil per application. Occasionally, an organic additive such as woodchip is added at ~1-3% to clayey soils to break up the cohesive nature of the soils and aid aeration.

2 [illegible]

2.1.1 The Soil Treatment Facility is proposed to accept and process up to 29,999 tonnes per annum of hazardous soils and 20,001 tonnes of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The total storage capacity of the site is 50,000 tonnes. The treatment areas consist of 2 treatment pads measuring at 3450m^2 and 3500m^2 for biotreatment/physical treatment and another 1 x 48800m^2 treatment pad solely for screening/processing. An indicative operational layout of the treatment and processing area and cross section is detailed in drawing refs: 3982-CAU-XX-XX-DR-V-1805 and 3982-CAU-XX-XX-DR-V-1806.

2.2 Pre-Assessment

2.2.1 Pre-acceptance procedures are undertaken to confirm the suitability of materials for treatment to subsequently achieve the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer including a clear statement of any waste characterisation samples that are deemed unsuitable for treatment. These are agreed in writing between the Waste Producer and FCC prior to an authorisation number (contract line) being issued by FCC at the weighbridge for deposit at the Soil Treatment Facility. The set of terms and conditions will include the following:

- Maximum soil contaminant concentrations for reuse of material in the restoration area or disposal within the landfill (re-use criteria);
- Limitations on physical and chemical characteristics of the soils (e.g. particle size, pH, moisture content); and,
- Statement from the waste producer confirming that soils containing tars, free oils, invasive species (e.g. Japanese Knotweed) and high moisture content will not be accepted to site.

2.2.2 The pre-assessment testing for asbestos is carried out to confirm the soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. If any variations or discrepancies should be found regarding the waste producer's waste description, FCC can either reject the waste immediately or attend the site of origin to undertaken further pre-acceptance checks and visual inspections. This will enable the operator to identify any potential issues which could be affecting the conformity of the source materials prior to any further acceptance of waste for treatment.

2.2.3 In the event that moisture content of the waste could result in the material not being self-supporting, then the potential for free water or free oil will be further reviewed. Should FCC determine that there is the high potential for material to contain untreatable materials or properties where the waste materials behave as a liquid or containing free water or oil then, the waste will not be quoted for acceptance and/or will be rejected.

2.2.4 If insufficient information is provided to adequately characterise the waste or determine its suitability for treatment, the Operator will undertake a pre-acceptance testing at the source site to establish an initial waste description. This pre-acceptance will include a

visual inspection. Waste soils will be tested in accordance with a general suite of analysis for soils based on the potential substances present from the site history and any existing chemical data. Sampling of waste soils will be undertaken by a technically competent person, using the sampling frequency utilised at the STF site for soil reception as a minimum. Samples will be clearly identified using labels and recorded on chain of custody forms for transfer to a soils laboratory. All testing and analysis will be undertaken using an UKAS/MCERT accredited laboratory and accredited methods (BAT 9).

2.3 Waste Acceptance

2.3.1 A full waste list is outlined in the Supporting Document reference: 3982-CAU-XX-XX-RP-V-3000.

2.3.2 On arrival to site, lorries entering will be weighed at the weighbridge and all appropriate documentation checked and referenced by the weighbridge clerk. The weighbridge clerk will direct the lorries to the designated soil reception area.

2.3.3 For soils containing asbestos, following satisfactory results from pre-assessment (confirmation of soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos) soils will be directed to the soils asbestos storage area. This is an external storage area with an impermeable base, here these soils will be undergo pre-acceptance testing and will be sheeted. Soils contaminated with hydrocarbons will be subject to pre-acceptance testing and formal acceptance prior to the commencement of biotreatment. Non-hazardous soils will be directed to a designated area for pre-acceptance testing prior to any physical treatment commencing.

2.3.4 If in the circumstance that a load is tipped and upon inspection is identified as non-conforming, (for example deleterious inclusions) the waste materials will be reloaded immediately and rejected. A record of the waste material rejection will be reported to the manager on duty who will record the event. If in the event of a non-conformity that takes place later e.g. chemical data shows inconsistencies against the data originally provided as a waste description by the producer. In this scenario, the waste producer will be contacted and the waste rejection procedure implemented where required.

2.3.5 All wastes received to Daneshill Soil Treatment Facility will be in accordance with general BAT requirements as detailed in BAT 39-44 which at pre-acceptance stage ensures that:

- All assessment of waste is undertaken by a suitability competent person;
- Testing is undertaken at a laboratory with UKAS/MCERTS accreditation All wastes on site is validated through chemical analysis; and visual inspection.
- Checks are undertaken to ensure that the method of treatment will allow reuse on site prior to any acceptance on site.

2.4 On Site Verification

2.4.1 On-site verification procedures will be carried out to ensure soils received at the Soil Treatment Facility (STF) are visually, structurally and chemically similar to those described during the pre-acceptance procedures and confirm compliance with the Environmental Permit and suitability for treatment.

2.4.2 Soil sampling will be performed by the STF technician or project manager in line with composite sampling methods as detailed in the British Standards BS812.

2.4.3 A minimum of at least one composite sample must be taken from each job (unique authorisation code) and in accordance with the sampling frequency highlighted in Table 1 below. Chemical testing is undertaken to ensure that the materials being tipped are consistent with the analysis and description provided by the client at the waste description stage.

2.4.4 Sampling requirements for soil samples are detailed within Table 1 below

Table1: Sampling requirements for Soil Samples

Volume of soil (t)	No. of samples needed (before or during acceptance at STF)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

2.4.5 The general suite of analysis for soils shall include:

- pH
- CLEA Metals
- Total TPH
- Total PAHs
- Total Cyanide (where required)
- Phenols (where required)
- SVOCs and VOCs (where required)
- PCBs (where required)
- Asbestos (screen) and quantification
- Moisture content

2.4.6 Soils deemed unsuitable for treatment will be removed from site and either returned to the waste producer or taken to a suitable permitted facility for final treatment/disposal

2.5 Screening/Processing Treatment of Soils

Screening of non-hazardous soils

2.5.1 Following acceptance and valid pre-acceptance testing results to confirm chemical validity, non-hazardous soils will be placed into their respective treatment batches and undergo physical treatment. Non-hazardous soils will be screened to remove oversize inclusions prior to reuse to ensure they are physically suitable.

Temporary storage of asbestos containing soils (prior treatment)

Upon satisfactory pre-acceptance and waste acceptance checks, on arrival to site, the soils will be weighed and directed from the weighbridge to the soils reception area and undergo an inspection and sampling for analytical testing. Soils will be stored on impermeable surfacing provided with bunded edges and sealed drainage. After placement on the storage area, the soils will be sheeted to reduce the potential for air borne emissions. The pre-assessment testing is carried out to confirm the soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Until the testing has been completed, the soils will remain sheeted. Following satisfactory results from pre-assessment confirming that the soils are compliant with the acceptance criteria, the soil can be stored externally, un-sheeted and will undergo pre-screening and handpicking for asbestos fragments. Asbestos containing soils with fibres concentrations that has to potential to become airborne at concentrations above the air monitoring detection limit will be rejected from site. Soils that meet all waste acceptance checks will be formally accepted for treatment.

Pre-screening and Handpicking of asbestos containing soils

2.5.2 Following formal acceptance, only hazardous soils containing asbestos will under-go pre-screening and handpicking, where pre-screening will be carried out prior to hand picking. Soils will be screened using a three-way screening (0-15mm, 15-50mm and 50mm+). This is to reduce the potential of damage to the picking station and make hand picking of asbestos debris more effective.

2.5.3 After screening, the picking station will provide an enclosed working area for hand-picking, details and specifications of the station are included in Appendix 3. A conveyor belt will be used on the picking line providing a smoother running line which will aid the hand-picking process. Treatment will only commence when waste acceptance testing has confirmed that the asbestos fibres content in soils is lower than 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Handpicking of small asbestos fractions will only be undertaken by suitably trained operatives, with asbestos fractions placed directly in polythene asbestos bags. The bags will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin.

2.5.1 All stockpiles generated from the screening/hand-picking will be visually inspected for the presence of residual asbestos prior to being samples for further biotreatment or reuse. Following hand-picking, the treated soils are deposited in a stockpile awaiting compliance testing prior to further onward treatment/disposal. Soils with elevated hydrocarbons will be transferred for bioremediation treatment. If the soils meet the 're-use' criteria, they will be retained on site for recovery operations on the Landfill Site.

2.5.2 Dust suppression will be provided for the screener as a preventative measure, in addition, air monitoring will be carried out hourly to assess if there is any detection of asbestos fibres above the method detection limit.

Storage of asbestos after screening/hand-picking

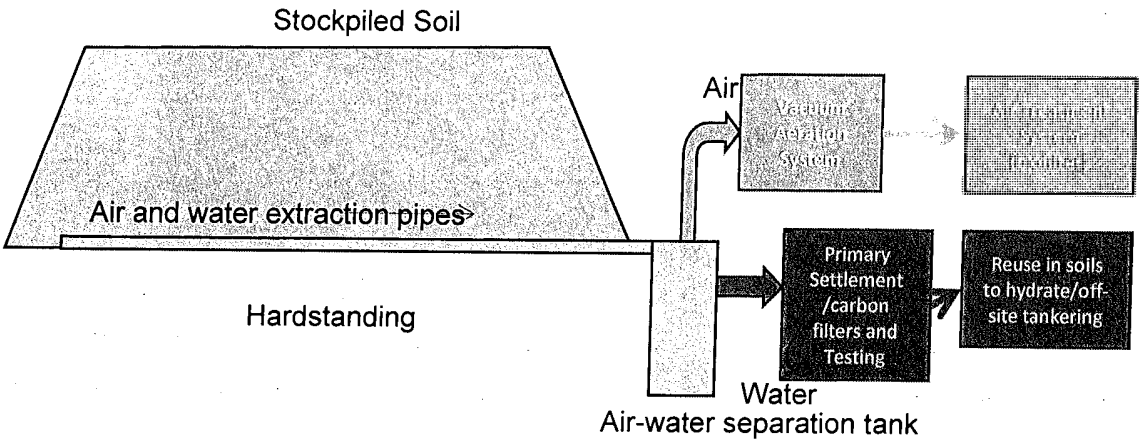
2.5.3 Following the screening and handpicking of asbestos fractions from the soils, the asbestos will be placed will be in bags which will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin. The locked asbestos bin will be stored on impermeable hardstanding.

2.5.4 Following screening, the soils will be stockpiled for use in recovery at Daneshill Landfill Site, this may also include soils that have undergone bioremediation process to remove oversized materials.

2.6 Bioremediation of Soils

2.6.1 Following screening and hand-picking, soils undergoing biotreatment activities will remove contaminants such as hydrocarbon utilising industry standard biopile technology as shown in Figure 1 below. The process will operate through the use of biopiles and moisture control, addition of suitable nutrients to the soil and forced air extraction to encourage micro-organism growth leading to the breakdown of hydrocarbons into by products such as carbon dioxide and water vapour.

Figure 1: Bioremediation Process



2.6.2 The biological treatment process varies between 8 to 16 weeks, dependent on the contaminants present in the soil.

2.6.3 Bioremediation of soils will be undertaken on a newly constructed GCL lined pad comprising sand blinding, crushed concrete and sealed drainage to allow pumping to holding tanks. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully. As there is no drainage network on site, all process waters will be pumped to on-site holding tanks with any excess water tankered off to an appropriate disposal facility.

2.6.4 Soils accepted at the STF are deposited on the treatment area. The soils are arranged into biopiles using a system of batches which allows the waste to be trackable by age of waste and from the point of origin to its location on the treatment pad.

2.6.5 Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

2.6.6 Biodegradation of the organic contaminants is carried out by microorganisms in the soil. This is enhanced by addition of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Management of moisture content is also essential for microbial activity; low moisture content has the potential to inhibit microbial growth, but excessive moisture can restrict airflow. The perforated aeration pipes located beneath the waste will extract air from the biopile to effectively control waste oxygen levels and moisture content to maintain aerobic conditions.

2.6.7 Temperature in the biopiles is maintained between 30 and 40°C to ensure the mesophilic microflora are predominately stimulated, optimising biodegradation.

2.6.8 The stages of the bioremediation process are detailed below:

- Initial Placement: The soil is placed on the treatment pad by a tipper lorry/dump truck where an excavator will form the biopile.
- Addition of Nutrients: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.
- Chemical Analysis – Approximately every 4 weeks the soil is analysed for contaminant concentrations to determine whether the biological treatment of the

soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process

- Nutrients testing – Every 2-4 weeks the soil is analysed for nutrient levels within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process.
- De-compaction of the soil – Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil. Reintroduction of treated water into the biopiles if emissions (e.g. dust) is being generated or soils are outside of the optimal moisture content range
- Validation testing: Once the soil treatment is deemed complete it is sampled for laboratory testing to ensure that contaminants meet the landfill re-use criteria.

2.6.9 On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent landfill void or reused on site as restoration soils.

2.6.10 There are no direct releases off-site other than via the engineered surface water management system. The site will be engineered so that all collected surface waters and process waters from biopiles will pass into a drain at the lowest points of the treatment pad and transferred into holding tanks. The holding tanks will store all surface and process waters until emptied and disposed of at a suitable facility offsite.

2.6.11 Treatment for soils will include pre-acceptance testing prior to formal acceptance. Non-hazardous soils will undergo pre-screening of oversize inclusions. Soils which are contaminated with asbestos will be hand-picked and the removal of asbestos debris in soils.

2.7 Post Treatment Verification Sampling

2.7.1 This is to ensure soils treated at the Soil Treatment Facility (STF) meet the waste acceptance criteria to enable their use for the restoration of the landfill.

2.7.2 The sampling of soils will be performed by the STF technician or project manager. The procedure uses composite sampling methods as provided in BS812. For batches where treatment has been completed the sampling frequency will be 1/500t of treated soil.

2.7.3 Soils that do not meet the acceptance criteria will be treated further (if deemed viable) or removed from site for treatment/disposal at a suitable permitted facility.

2.8 Transfer – Landfill Restoration or off-site

2.8.1 Treated soils will be transferred onto the landfill for storage prior to spreading in accordance with the approved restoration plan.

3.1 Mobile Plant

3.1.1 Soils will be handled using tracked 360° excavators from reception through the treatment process. Treated soils will be moved onto the landfill restoration area using dump trucks.

3.1.2 A mechanical screener will be brought in as required to remove oversize material from treated soils prior to reuse on the landfill restoration area. In addition, a mechanical screener and picking station will be provided for the hand-picking removal of asbestos fragments from hazardous soils and screening of non-hazardous soils.

3.2 Fixed Plant

3.2.1 Fixed plant will include the following items

- Weighbridge
- Office
- Bunded process/surface water storage tank
- Air Blower and containerised control panel/transfer pumps
- Biofilter
- Process water treatment vessels
- Storage Container

4.1 Biofilter

4.1.1 Air forced down through the biopiles via the extraction pipework system will pass through a biofilter before being discharged to air.

4.1.2 The blower connects to a manifold with several perforated pipes covered in stone above an impermeable surface. Overlying these pipes is oversize compost or woodchip mixture, nutrients and small amount of contaminated soil (<5%) to inoculate the biofilter placed to a height of approximately 1.5m. The compost/nutrient/soil mixture is overlain by an irrigation pipe network on top to maintain the moisture content and covered with a tarpaulin to ensure the biofilter does not dry out. It is then tested every month to ensure the process parameters remain within the optimal range. Olfactory odour checks are also undertaken daily.

4.2 Surface Water drainage from treatment pad

4.2.1 Currently surface water drains to a sump which drains to a tank which is pumped out when required. Details of the site drainage system for leachate in the treatment pad and site design is shown in drawing ref: 3982-CAU-XX-XX-DR-V-1806.

4.2.2 Upon commencement of operations, surface water is collected within the process pipework from where it will be pumped into the small treatment plant prior to disposal off-site via tanker or redirected via a pipeline to humidify the biofilter/biopiles. Valves can be switched to use treated water to irrigate the biofilter/biopiles and then reverse back to collect water for tanker disposal.

4.2.3 The treatment plant comprises:

- $50m^3$ settlement tank with transfer pump and level detectors
- Oil Water separator/settlement tank with transfer pump and level detectors
- $5m^3$/hr sand filter
- $5m^3$/hr granular activated carbon filter

4.2.4 The capacity of the treatment plant is **<50tonnes/day**.

4.2.5 Effluent from the treatment plant will be stored within a tank prior to reuse within the treatment process or removal for further treatment off-site.

4.3 STF Dust Control

4.3.1 Dust suppression is to be undertaken when soil movement is generating excessive dust, this includes traffic movements and soil turnover. The source of dust will be identified and the operation creating a dust presence ceased. Mitigation measures will include the

use of the on-site water bowser with spray rail or equivalent, rain guns and or misting systems will be employed if required.

4.4 Asbestos Fibres

4.4.1 Daneshill Soil Treatment Facility is proposed to accept waste soils containing mixed forms of asbestos with an asbestos fibrous content at concentrations of lower than <0.1% for chrysotile asbestos, and fibre concentration of <0.01% for all other asbestos. These fibre contents will be validated at the pre-acceptance testing stage to remove the potential for airborne emissions of asbestos fibres above the detection limit. Air monitoring for asbestos and particulate testing will be undertaken at 6 locations on site, their locations are detailed within the Dust Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307 in the dust monitoring plan, drawing ref: 3982-CAU-XX-XX-DR-V-1803.

4.5 Cross-Contamination and clean down procedures

4.5.1 To control and prevent cross-contamination of asbestos fibres, only asbestos soils will undergo physical treatment and hand-picking of asbestos fragments at any one time.

4.5.2 Pre-acceptance testing of asbestos waste prior to screening and hand-picking will validate that soils undergoing this physical process do not contain unacceptable concentrations of asbestos fibres (results detected above those detailed in Section 6.4.1 above will be rejected). Therefore, the accumulation and build-up of asbestos fibres on mobile plant/machinery is not anticipated. Where decontamination procedures are required when mobile equipment/plant is to be removed from site. Cleaning down procedures will be carried out using wet cleaning techniques; any cleaning residues/sludges generated will be placed into one of the storage areas available to accept contaminated soils. In addition, air monitoring will be undertaken to ensure that the concentration of any potential airborne asbestos fibres is below the detection limit of 0.01f/ml.

4.5.3 Any contaminated waters from cleaning will be pumped to the on-site holding tanks which will be tankered off for disposal at a suitable facility. Any PPE/RPE used will be bagged and disposed of with any asbestos wastes and classed as hazardous for disposal at a suitable facility.

5. MONITORING

5.1.1 Visual monitoring of equipment, including plant, and soil biopiles shall be undertaken on a daily basis. Equipment modules will be inspected every morning and evening upon module opening and closing respectively. Noise, vibration and heat observations of equipment shall also be executed at these times. Monitoring of emissions is included in the Emissions Management Plan, under document ref: 3982-CAU-XX-XX-RP-V-0307.

5.1.2 Proposed monitoring is limited to the following:

- Air emissions from the biofilter.
- Material testing of the biofilter matrix.
- Water emissions from the water discharge point at the STF.
- Dust concentrations in air at the STF.
- Airborne asbestos fibre monitoring in air
- PID measurements for VOCs at the STF.
- Noise assessment
- Odour assessment

5.2 Asbestos Baseline Background Monitoring

5.2.1 It is an established procedure to attain pre-operational baseline monitoring for asbestos to form the basis when determining the air quality prior to any treatment activities and the issue of the permit The operator will obtain baseline background monitoring prior to the commencement of operations where 3 rounds of monitoring will be taken at locations shown on drawing ref: 3982-CAU-XX-XX-DR-V-1803.

5.2.2 Following issue of the permit, the operator will be able to compare the monitoring results against reference background levels obtained from baseline monitoring. The background reference levels will be used as an action level should there be any soils with elevated asbestos fibres above the detection limit (0.01f/ml) or reference background level.

5.2.1 Detail of the frequency and thresholds of monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

5.3 Process Emissions

5.3.1 The point emissions from the STF include process water, surface water collection and air emissions from the biofilter as well as dust and odour from general site works. The monitoring for these processes includes:

- Biofilter sampling (from exhaust vents)
- Process water sampling
- Visual and olfactive daily assessment for dust and odour on site.
- Dust monitoring

5.4 Biofilter Monitoring

5.4.1 The biofilter will be regularly checked and maintained to ensure appropriate media particle size, nutrient levels, temperature and moisture content. Equipment will be calibrated in accordance with manufacturer's instructions or as agreed with the Environment Agency. These procedures will maintain an effective air extraction system, reducing odour emissions and identifying any leaks or damage for repair. The frequency for the biofilter sampling is monthly and is scheduled through a nominated UKAS accredited laboratory. The schedule of analysis for the biofilter is as follows:

- Ammonia
- TVOCS
- Hydrogen Sulphide
- VOC's
- Photo-ionisation detector (PID) to quantify gaseous emissions.

5.4.2 Detail of the frequency and thresholds of biofilter monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

5.4.3 The use of a nominated laboratory will permit independent testing of the biofilter air quality for reporting and recording to allow compliance with the permit conditions. The procedure for biofilter monitoring is STF – WI 008. The air sample analysis undertaken before and after the biofilter demonstrates that ~99% of monitored contaminants are continuously removed during the operation of the STF. The biofilter is operational 24 hours per day.

5.5 Process Water Monitoring

5.5.1 The water quality in the water collection tank will be monitored on a monthly basis. A sample will be obtained and analysed for parameters to ensure that they do not exceed limits as stated by the receiving treatment facility. Regular checks will be made to ensure no visible oil or grease is present in the tanks.

5.6 Air Quality Monitoring

5.6.1 If during air quality monitoring, fibre concentrations exceed 0.01f/ml or the agreed background reference value then all work operations will cease to allow for dampening down measures to limit the amount of airborne asbestos fibres. Dust suppression and potentially covering of soils will be carried out.

5.6.2 An exceedance of 0.01f/cm^3 will be followed with an immediate investigation; a sample will be submitted for electron microscopy to confirm the measured concentration of asbestos present. Until results are received, soils will remain covered and untreated. The EA will be notified of any exceedance. It is considered that the likelihood of an exceedance occurring is very low, this is due to the pre-acceptance testing which is carried out on every hazardous soil to confirm the asbestos fibrous content of that sample prior to any processing and screening. No exceedances of detection limits using either Phase Contrast Microscopy (PCM) or Scanning Electron Microscopy (SEM) methodologies have ever occurred in the Operator's experience of undertaking this treatment method on other sites.

5.6.3 Detail of the frequency and thresholds of monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

5.7 STF Dust Monitoring

5.7.1 Visual dust monitoring shall be undertaken on a daily visual basis during periods of dry weather or following a complaint. Monthly onsite monitoring will be carried out using a hand-held dust detector (Dustmate http://dustmonitor.co.uk/ or similar) as well as fixed Frisbee gauges. Details of dust monitoring in included within the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.

5.8 Photo-Ionisation Detector Measurements

5.8.1 A photo-ionisation detector (PID) shall be used on a bi-monthly basis at around the perimeter and near the biofilter (6) to quantify gaseous emissions. If PID readings for Benzene exceed 1ppm (based on EH40 guidance), then the source shall be identified and assessed by the operator. It will be dealt with, for example, increasing PPE levels on site, a cessation of soil movement or covering of odorous soils with a tarpaulin etc.

5.8.2 If site activity involves the movement of soil that has been identified as containing high concentrations of VOC which may be harmful to personnel working in the vicinity or other off-site receptors, then PID and benzene monitoring shall occur on a daily basis.

5.8.3 Results are recorded in the on-site database system. Detail of the frequency and thresholds of monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

5.9 Noise Measurements

5.9.1 Observations relating to excessive noise incidents shall be recorded in the database system.

5.10 STF Odour Control

5.10.1 Regular daily checks will take place for odours on and around the treatment area. If excessive odours are identified, the source of odour will be assessed by the operator. It will be dealt with, for example, by a cessation of soil movement if required or covering of odorous soils with a tarpaulin etc. Observations shall be logged in the database system. Details of odour monitoring and procedures are detailed within the Odour Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0308 included within this application.

5.11 Recording of Results

5.11.1 All analytical results and monitoring results shall be stored onto the STF database under the relevant environmental batches location. Any changes made to the type of monitoring or adjustment to the biofilter shall also be recorded on the STF database.

6.1.1 The energy requirements of the facility are low with the main energy consumption associated with the treatment processes with the majority of energy use from the air extraction blower.

6.1.2 As the energy requirements of the facility in general are low and no alternatives are available with lower energy use, no improvements are considered necessary. Basic energy saving measures will be adopted and continually reviewed. This includes measures such as: -

- Efficient use of plant and machinery to avoid unnecessary ignition;
- Plant and machinery to be switched off when not in use; and
- Regular maintenance of all plant and machinery.

7.1.1 The activities on site require amounts of resources and raw materials as part of the treatment process.

7.1.2 A water bowser may be used at the site during dry conditions to control the generation of dust. The water will be used only when necessary, and the minimum amount will be used. Water treated in the water treatment plant (detail within drawing ref: 3982-CAU-XX-XX-1806) from surface water run off can be used in place of mains water.

7.1.3 Fuels and chemicals associated with on-site plant will be appropriately stored and bunded; use of diesel will be undertaken in accordance with the site's EMS.

7.1.4 A Standard NPK fertiliser 25:05:05 ratio is used to encourage micro-organism growth. Typical application rates are 1kg/tonne of soil per application equating to a usage of up to 150 tonnes per year if the maximum of 3 applications per batch are used. Bags of the fertilizer will be stored with a waterproof cover.

7.1.5 Organic additive such as woodchip maybe added at ~5% to clayey soils to break up the cohesive nature of the soils and aid aeration. The biodegradation of the organic contaminants can be enhanced by addition of very low concentrations of organic material such as woodchip. Leaf litter within street residues (20 03 03) are received for treatment increases soil temperatures during the colder months. Use of these raw materials replaces virgin materials such as manufactured fertiliser or virgin woodchip and using 'waste raw materials' which would otherwise be landfilled. Approximately 30m^3 of woodchip is stored in an articulated lorry at any one time.

7.1.6 Details of the raw materials proposed are in Table 2 below, it is anticipated that a maximum of up to 2,500 tonnes per annum of woodchip of similar organics from Table 2 will be required.

Table 2: Raw materials to be used in the bioremediation treatment process

Raw Material Description	EWC Specification and use
Wood Off-Specification compost Wood other than those mentioned in 19 12 06	17 02 01 ,19 05 03 & 19 12 07 – wood chips break up cohesive nature of soils, aids aeration and enhances biodegradation Use within biofilter process and occasionally within soil treatment
Street cleaning residues	20 03 03 Leaf litter following removal of residues – improves soil temperatures during winter conditions

7.1.7 Street cleaning residues are usually a combination of organic waste inclusions and soils which is not normally accepted unless it is hazardous (due to the presence of hydrocarbons) and is handpicked by the producer to remove the detritus such as plastics. However, in Autumn and Winter months, leaf litter wastes (following handpicking by the producer to remove rubbish such as crisp packets, bottles and plastics) is accepted at the soil treatment facility. Due to the high leaf litter content within EWC 20 03 03, there is an increased amount of cellulose/lignin which (similar to composting of green wastes) provides an energy source for the thermophilic microflora range present in soil that proliferates at higher temperatures (45-60°C) compared to the mesophilic microflora that are most effective in soil for mineralising hydrocarbons at 25-40°C. The addition of leaf litter in low quantities benefits the biotreatment process as for every 10°C increase in soil temperature, the respiration rate of microflora doubles.

8. EMERGENCY PROCEDURES

8.1.1 FCC operates a Near Miss, Incident and Emergency management systems, specific Emergency procedures for this facility will cover:

- Spillages of waste and/or reagents.
- Fire
- Injury to staff or visitor
- Incident

8.1.2 FCC has ISO14001, 18001 and 45001 accreditation and this will be extended to this facility.

9 REVIEW AGAINST INDICATIVE BAT STANDARD

	Overall Environmental Performance
BAT 1	*In order to improve the overall environmental performance, BAT is to implement and adhere to an environment management system (EMS) that incorporates all of the following features:* *I) Commitment of the management, including senior management;* *II) Definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the installation;* *III) Planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;* *IV) The implementation of procedures;* *V) Checking performative and taking corrective action;* *VI) Review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness;* *VII) Following the development of cleaner technologies;* *VIII) Consideration for the environmental impacts from the eventual decommission of the plant at the stage of designing a new plant, and throughout its operating life;* *IX) Application of sectoral benchmarking on a regular basis;* *X) Waste stream management;* *XI) An inventory of waste water and waste gas streams;* *XII) Residues management plan;* *XIII) Accident management plan;* *XIV) Odour management plan;* *XV) Noise and vibration management plan.*
	The company operates under an ISO14001 accredited environmental management system, audits of the performance of key plant, and all maintenance that has been undertaken will be undertaken and reviewed as part of the company's management system. The company management system is audited externally as part of the ISO 9001 and 14001 accreditation. Further information is provided within the management plan summary provided with this application, however in summary the site will have: - • A full maintenance schedule for all machinery and equipment on site;

	• Documented procedures to control all aspects of the operation that may have an impact on the environment, including contingency and operational methods which are to be undertaken in the event that there is a plant breakdown, or activities could lead to an unacceptable emission; • Well documented procedures for monitoring emissions and impacts including the use of a daily site log. All monitoring will occur in accordance with the Environmental Management plans The site will undertake a preventative maintenance programme where site plant, and infrastructure will be inspected on a daily, weekly and monthly basis in accordance with written procedures. Training systems are in place and all employees which will include: - • Relevant treatment activities undertaken on site; • Management techniques to be employed for all aspects of waste treatment which are relevant to their position • Reporting any abnormal events; • Contingency measures in place to prevent breaches of the Environmental Permit in the event of abnormal weather conditions; and ccontingency measures to be taken in the event that accidental emissions are released to the environment. The operator will only appoint suitably qualified contractors, and all purchasing of equipment and materials will be undertaken in accordance with the management system.
BAT 2	*In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques detailed in 'BAT 2 Table 'best available techniques (BAT) conclusions for waste treatment industries (BREF), under Directive 20/10/75/EU, from the Official Journal of the EU' summarised below:* *Pre-acceptance procedures* *Waste Acceptance procedures* *Waste tracking and inventory* *Output quality management system* *Ensure waste segregation* *Waste compatibility prior to mixing or blending of waste* *Sorting of incoming solid waste*

	Pre-acceptance and Waste Acceptance procedures Waste pre-acceptance and Waste acceptance procedures will be in place to ensure that only waste types permitted are accepted for treatment, procedures are outlined in Section 2.2-2.3 and contained within Appendix 1 of this document. No liquid wastes, drummed wastes or laboratory smalls will be accepted. During pre-acceptance checks, the type of contamination of each waste load will be established as will the end use of the waste (after it has been treated. The waste will only be accepted if it is compliant with the permitted waste types and if the site is able to treat the waste. The treatment method is determined prior to the waste being delivered to the facility. In the event of any non-conforming wastes a waste rejection notification will be issued informing that the waste is not suitable for treatment Waste deemed not acceptable will be rejected as per written procedures (see Appendix 1). Rejected wastes will be stored within a designated quarantine area pending removal from site and a note will be made of the waste type, quantity, hazardous properties and storage requirements. The quarantine area is segregated from the storage areas for other permitted wastes to reduce the risk of cross contamination. Waste tracking and inventory Waste tracking system will be used as detailed in written procedures contained in Appendix 1. Written records will be maintained which will include information on the waste type, quantity, how the materials were stored and how they were subsequently disposed of. A daily assessment of the current capacity of the site is undertaken and waste is only accepted if there is sufficient capacity. A spreadsheet calculating how much waste is on site will be updated daily to account for waste received on site where waste tonnages have been dedicated (e.g. pre-storage, bioremediation treatment, wastes treated, and wastes removed from site). Asbestos fractions hand-picked and placed in sealed double bags. The number of bags will be recorded and placed in a locked asbestos waste bin (stored on impermeable hardstanding). Written records will be maintained which will include information on the waste type, quantity, how the materials were stored and how they were subsequently disposed of. Output Quality Management System The Operator will have a technically competent manager who is qualified to 'Level 4 in Waste Management Operations – Managing', and 'Treatment of Hazardous Waste (Remediation HROC6 or equivalent)'. The roles of sales and technical staff are clearly defined within the procedures and staff will only undertake activities for which they have received suitable training.

	All staff undertaking waste acceptance procedures will receive suitable training in the waste acceptance procedures, as well as in waste handling and the relevant health and safety and environmental procedures in place. The site will be manned by a minimum of two staff under normal circumstances, during waste reception periods, the operations manager to be qualified to at least HNC Chemistry or equivalent. Ensure waste segregation Segregation of the accepted waste types is not necessary as they are not considered to be reactive. In the event of any non-conforming wastes a waste rejection notification will be issued informing that the waste is not suitable for treatment Waste deemed not acceptable will be rejected as per written procedures (see Appendix 1). Rejected wastes will be stored within a designated quarantine area pending removal from site and a note will be made of the waste type, quantity, hazardous properties and storage requirements. The quarantine area is segregated from the storage areas for other permitted wastes to reduce the risk of cross contamination. Waste Compatibility Waste pre-acceptance and Waste acceptance procedures will be in place to ensure that only waste types permitted are accepted for treatment, procedures are outlined in Section 2.2-2.3 and contained within Appendix 1 of this document. Section 2.4 details on-site verification, Reception and Compliance testing will be undertaken in accordance with written procedures (see Appendix 1) Testing will be performed to ensure that the materials accepted are consistent with the analysis and description supplied at the pre-characterisation stage. All external lab analysis will be carried out by MCerts and UKAS-accredited laboratories as detailed within the procedures. Samples shall be retained on site for a minimum of two days following samplings, the accredited laboratory will retain samples for 30 days. Sorting of Incoming waste As per Section 2.5, following acceptance and valid-pre-acceptance testing result (dependant on the waste stream) wastes will undergo the following: Screening of non-hazardous soils

	Temporary storage of asbestos containing soils Pre-screening and handpicking of asbestos containing soils Storage of asbestos after screening/hand-picking
BAT 3	*In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams as part of the environmental management system.*
	Water usage is minimal. Rainfall derived drainage water will be used for moisture control where required. Use of mains water restricted to washing plant etc. The waste discharge areas comprise of impermeable pads which drains to a collection pipework so that any runoff will be contained. There is no drainage to sewer at Daneshill Landfill site, waters will either be used within the process to maintain optimum moisture levels or stored in tanks awaiting collection and disposal to a suitable treatment facility. See Section 5.8 'Photo-ionisation Detector' on quantifying gaseous emissions.
BAT 4	*In order to reduce the environmental risk associated the with storage of waste, BAT is to use all of the techniques given below* *Optimised storage location* *Adequate storage capacity* *Safe storage operations* *Separate area for storage and handling of packaged hazardous waste*
	Waste Acceptance procedures, Waste Rejection Procedures outlined in Section 5.2 of this document and contained within Appendix 1. Waste storage is outlined in Section 3 of this report. A daily assessment of the current capacity of the site is undertaken and waste is only accepted if there is sufficient capacity. The waste storage areas are on impermeable treatment pads with sealed drainage system (detail shown in drawing ref: 3982-CAU-XX-XX-DR-V-1806) any runoff will be treated and then either stored for reuse (within the process to maintain optimum moisture levels) or stored in tanks awaiting collection and disposal to a suitable treatment facility. All areas will be clearly marked using signage. All vehicles delivering waste travel over a calibrated weighbridge and a ticket is printed for a record. The driver is then directed to the designated unloading area by the site operation staff. The site is always manned during operational hours.

	The site layout has been designed to ensure that treatment and storage areas are separate from the rest of the site so as to ensure segregation of activities. Wastes will not be stored in container, the segregation of accepted waste types is not necessary as they are not considered to be reactive. The proposed STF site is in a predominantly agricultural setting, the nearest residential dwellings include a travellers site located 155m SWS from the proposed treatment facility and Loundfield Farm 500m to the east. Materials are stored in such a way as to avoid double handling i.e. wastes are received, stored, treated and moved to the post treatment area. Wastes will only be removed from the storage area if sufficient capacity is available for them to be treated. Waste will be either be treated or stored in stockpiles prior to treatment taking place. All waste that is accepted on site will commence treatment within 10 days of being accepted on site. A spreadsheet calculating how much waste is on site will be updated daily to account for waste received on site where waste tonnages have been dedicated (e.g. pre-storage, bioremediation treatment, wastes treated, and wastes removed from site). Asbestos fractions hand-picked and placed in sealed double bags. The number of bags will be recorded and placed in a locked asbestos waste bin (stored on impermeable hardstanding).
BAT 5	*In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.* *Handling and transfer procedures aim to ensure that wastes are safely handled and transferred to the respective storage or treatment. Including the following elements:* *A) Handling and transfer of waste are carried out by competent staff;* *B) Handling and transfer of waste are duly documented;* *C) Measures are taken to prevent, detect and mitigate spills;* *D) Operation and design precautions are taken when mixing or blending wastes;*
	The Operator will have a technically competent manager who is qualified to 'Level 4 in Waste Management Operations – Managing', and 'Treatment of Hazardous Waste (Remediation HROC6 or equivalent)'. The roles of sales and technical staff are clearly defined within the procedures and staff will only undertake activities for which they have received suitable training. All staff undertaking waste acceptance procedures will receive suitable training in the waste acceptance procedures, as well as in waste handling and the relevant health and safety and environmental procedures in place.

	The site will be manned by a minimum of two staff under normal circumstances, during waste reception periods, the operations manager to be qualified to at least HNC Chemistry or equivalent.
	Monitoring
BAT 6	*For relevant emissions to water as identified by the inventory of waste water stream, BAT is to monitor key process parameters at key locations (e.g. at inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation)*
	Monitoring and reporting of emissions currently undertaken as a requirement of the permit.
BAT 7	*BAT is to monitor emissions to water with at least the frequency detailed in BAT 7 'best available techniques (BAT) conclusions for waste treatment industries (BREF), under Directive 20/10/75/EU, from the Official Journal of the EU'*
	Monitoring and reporting of emissions is currently undertaken as a requirement of the permit. There will be no groundwater monitoring required as part of the proposed operations. The waste discharge areas comprise of impermeable pads which drains to a collection pipework so that any runoff will be contained. There is no drainage to sewer at Daneshill Landfill site, waters will either be used within the process to maintain optimum moisture levels or stored in tanks awaiting collection and disposal to a suitable treatment facility. The water quality in the water collection tank will be monitored on a monthly basis. A sample will be obtained and analysed for parameters to ensure that they do not exceed limits as stated by the receiving treatment facility. Regular checks will be made to ensure no visible oil or grease is present in the tanks.
BAT 8	*BAT is to monitor channelled emissions to air with at least the frequency detailed in BAT 8 'best available techniques (BAT) conclusions for waste treatment industries (BREF), under Directive 20/10/75/EU, from the Official Journal of the EU' and in accordance with EN Standards. If EN standard are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.*
	See Section 5 of this document for Monitoring for: • Air emissions from the biofilter. • Material testing of the biofilter matrix. • Water emissions from the water discharge point at the STF. • Dust concentrations in air at the STF. • Airborne asbestos fibre monitoring in air • PID measurements for VOCs at the STF. • Noise assessment • Odour assessment

	Daily visual monitoring to air for dust, litter and olfactory odour monitoring will be carried out on site. Monitoring is undertaken as per the Operating Techniques and requirements of the management system and operational procedures. Given the rural nature of this activity and the existing similar operations on site that have not given rise to complaints, noise modelling is not considered to be required. Noise management has been addressed within the Environmental Risk Assessment. Air forced down through the biopiles via the extraction pipework system will pass through a biofilter before being discharged to air. Emissions to be tested every month to ensure the process parameters are within the optimal range. Olfactory odour checks are also undertaken daily. During soil screening activities, asbestos monitoring around the process area will be carried out every 2 hours as detailed in the monitoring section in the Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-0307.
BAT 9	*BAT is to monitor diffuse emission or organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPS with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.*
	N/A
BAT 10	*BAT is to periodically monitor odour emissions*
	Monitoring is undertaken as per the Operating Techniques Report (document ref. 3982-CAU-XX-XX-RP-V-0305) and requirements of the management system and operational procedures. The wastes to be accepted are not inherently malodorous although hydrocarbons may produce slight odour - see Amenity and Accidents Risk Assessment (document ref. 3982-CAU-XX-XX-RP-V-0303). As none of the waste is putrescible, odour modelling is not deemed to be required for this installation. The waste types and treatment is not expected to cause odour at levels that will cause a nuisance outside of the permit boundary. The Air Quality Assessment and Environmental Risk Assessment outline the techniques that will be employed to control odour. Given the nature of the activity and the odour control techniques that will be in place, the installation is not expected to generate high levels of odour. A suitability qualified person will do a perimeter walk on a daily basis, if the daily walk identifies high levels of odour at the site boundary, the operator will investigate what activities were occurring on site at the time. If the odour proves to be coming from the site, the operator may investigate further operating techniques to control/diminish the odour levels. See Air Quality Assessment (Appendix 2) & Amenity and Accident Risk Assessment (document ref. 3982-CAU-XX-XX-RP-V-0303).

	Closest residential receptor is approximately 155m from proposed operation. The facility will operate in accordance with the odour management techniques in this document. All abatement equipment will be in place prior to operations commencing. The operator will operate the facility in accordance with BAT for the sector and will review the operating techniques on an annual basis, upon changes to regulations/guidance or after a substantiated complaint as verified by the Environment Agency. All waste will be thoroughly screened through pre-acceptance checks. Any waste which is likely to cause unacceptable odour will be rejected at this stage. If, upon arrival of waste at the site, the visual checks identify the odour content of waste may cause problems at the site, the waste will either be rejected, or if there is sufficient capacity to immediately treat or safely store the waste, the waste may be accepted. There will be no scrubber liquors associated with the site operations, therefore odours and their controls is not applicable. Regular daily checks will take place for odours on and around the treatment area. If excessive odours are identified, the source of odour will be assessed by the operator. It will be dealt with, for example, by a cessation of soil movement if required or covering of odorous soils with a tarpaulin etc. Observations shall be logged in the database system. Details of odour monitoring and procedures are detailed within the Odour Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0308 included within this application.
BAT 11	*BAT is to monitor the annual consumption of waste, energy and raw materials as well as the annual generation of residue and wastewater, with a frequency of at least once per year.*
	Monitoring is undertaken as per the Activities and Operating Techniques Report (document ref.3982-CAU-XX-XX-RP-V-0305) and requirements of the management system and operational procedures. The annual consumption of waste, energy, raw materials and the generation of waste water will be reported on an annual basis. It is considered however that the energy requirements of the operation are not considered to be significant, Specific Energy Consumption (SEC) information is not applicable to the site operations. The use of Raw Materials is detailed further in Section 7 of this document and specific details are provided in the Operating Techniques. The site will utilise the following raw materials: • Oil and fuels • Standard NPK fertilizer

	• leaves from road sweepings, organic woodchip, Datasheets for the raw materials will be kept on site. A regular review of raw materials will be carried out as per requirements of ISO14001 environmental management system, this will include quality-assurance procedures, waste minimisation and substitutions for less polluting options. Water requirement for the proposed operation are minimal, rainfall derived drainage water will be used for moisture control where required. Use of mains water restricted to washing plant etc. Usage will be reported on a yearly basis within the annual report submitted to the Environment Agency and an audit shall be undertaken within the first two years of operation. Water efficiency objectives will be identified and reported on in an annual basis with an annual report including investigations into water saving technologies. Techniques to minimise water usage will be employed as per requirements of ISO14001 environmental management system.
	Emissions to air
Bat 12	*In order to prevent, or where that is not practicable, to reduce odour emissions, BAT is set up, implement and regularly review an odour management plan, as part of the environmental management system, that includes all of the following elements:* *Protocol for containing actions and timelines;* *Protocol for conducting odour monitoring as set out in BAT 10;* *Protocol for response to identified odour incidents, e.g. complaints* *An odour prevention and reduction programme designed to identify the source(s); to characterise the contributions of the sources; and to implement prevention and/or reduction measures.*
	See BAT 10 and Odour Management Plan document ref: 3982-CAU-XX-XX-RP-V-0308, Air Quality Impact Assessment (Appendix 2) included within this application
BAT 13	*In order to prevent or, where that it not practicable, to reduce odour emissions, BAT is to use one of more a combination of the following techniques:* *a) minimise residence time* *of potentially odorous waste in storage on in handling systems (e.g., pipe, tank containers) in particular in anaerobic conditions* *b) Using chemical treatment* *c) Optimising aerobic treatment*

	See BAT 10 and Odour Management Plan document ref: 3982-CAU-XX-XX-RP-V-0308, Air Quality Impact Assessment (Appendix 2 included within this application
BAT 14	*In order to prevent or, where that is not practicable, to reduce emissions to air, in particular of dust, organic compounds and odour. BAT is to use an appropriate combination of the techniques given below:* *a) Minimizing the number of potential diffuse emissions sources* *b) Selection and use of high integrity equipment* *c) Corrosion prevention* *d) Containment, collection and treatment of diffuse emissions* *e) Dampening* *f) Maintenance* *g) Cleaning of waste treatment and storage areas* *h) Leaks detection and repair (LDAR) programme*
	Dust management will contain the following measures: - • provision on site of a water bowser equipped with rain gun, misting and adequate year-round water supply and dust suppression by regular spraying in dry conditions; • use of uncontaminated water for dust suppression, to avoid re-circulating fine material; • high standards of housekeeping to minimise track-out and windblown dust; • a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment; • minimisation of drop heights during tipping; • clear delineation of stockpiles to deter vehicles from running over edges; and • effective staff training in respect of the causes and prevention of dust. • inspection and maintenance of all trafficked surfaces; • regular compaction, grading and maintenance of haul routes and unsurfaced routes; • setting an appropriate speed limit; • fitting all site vehicles and plant with upswept exhausts and radiator fan shields where practical;

	• even loading of vehicles to avoid spillages; • sheeting of haulage loads; • regular removal of spilled material from site routes. For VOCs, see the Air Quality Impact Assessment (Appendix 2) For fugitive, dust and odour emissions, see the Air Quality Impact Assessment (Appendix 2) Odour Management Plan (document ref. 3982-CAU-XX-XX-RP-V-0308) and Amenity & Accidents Risk Assessment (document ref: 3982-CAU-XX-XX-RP-V-0303. As per the company EMS and detailed in the Amenity & Accidents Risk Assessment, maintenance of mobile plant/equipment will be in line with manufacturers specification. For the pre-screening and hand picking of asbestos containing soils, see Section 2.5 'Screening/Processing Treatment of Soils' of this document. After screening, the picking of asbestos will be carried out in an enclosed working area, details and specifications of the station are included in Appendix 3. A conveyor belt will be used on the picking link providing a smoother running line which will aid the hand-picking process and reduce the potential for agitation. A LDAR programme is not applicable to the proposed operations at Daneshill Landfill Site.
BAT 15	*BAT is to use flaring only for safety reasons or for non-routine operation conditions (e.g. start-ups, shut downs) by using techniques below* *a) correct plant design* *b) Plant management*
	N/A to the proposed operations.
BAT 16	*In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use the techniques detailed below:* *a) Correct design of flaring devices* *b) Monitoring and recording as part of flare management*
	N/A to the proposed operations.
	Noise and Vibrations
BAT 17	*In order to prevent, or where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan as part of the environmental management system.*

	Given the rural nature of this activity and the existing similar operations on site that have not given rise to complaints, noise modelling is not considered to be required. Noise management has been addressed within the Noise Management techniques provided with the Amenity and Accident Assessment, document ref: 3982-CAU-XX-XX-RP-V-0303 of this application. • Noise management techniques are employed at the facility as set out in the Environmental Risk Assessment. • In summary the site will employ the following BAT recognized techniques: - • Ensuring site roads and surfaces are kept in good working order; • Acoustic dampening of noise generating equipment; • Low level reversing alarms; • Deliveries and pickups from the site will only take place within the stipulated operational hours; and, • Minimizing drop heights when handling material.
BAT 18	*In order to prevent or where that is not practicable, to reduce noise and vibration emissions, BAT is to use of or a combination of the techniques given below.* *a) Appropriate location of equipment and buildings* *b) Operational measures* *c) Low-noise equipment* *d) Noise and vibration control equipment* *e) Noise Attenuation*
	See Response to BAT 17, Noise Management techniques provided with the Amenity and Accident Risk Assessment, document ref: 3982-CAU-XX-XX-RP-V-0303.
	Emissions to Water
BAT 19	*In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that it not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given below.*
	There are no emissions to groundwater. The operation will not have a dedicated water supply.

	All offloading is on impermeable bases with sealed drainage. The waste storage areas are on impermeable treatment pads with sealed drainage system (detail shown in drawing ref: 3982-CAU-XX-XX-DR-V-1806) any runoff will be treated and then either stored for reuse (within the process to maintain optimum moisture levels) or stored in tanks awaiting collection and disposal to a suitable treatment facility. The on-site holding tanks are bunded to 110% and its condition will be monitored regularly. The water quality in the water collection tank will be monitored on a monthly basis. A sample will be obtained and analysed for parameters to ensure that they do not exceed limits as stated by the receiving treatment facility. Regular checks will be made to ensure no visible oil or grease is present in the tanks. See Management Procedures in Appendix 1. Further details of the water treatment and discharge are outlined in sections 6 and 7.
BAT 20	*In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of techniques.*
	See response to BAT 19 and details of the water treatment and discharge are outlined in sections 6 and 7. Waste water will not be treated on site.
	Emissions from accidents and incidents
BAT 21	*In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all for the techniques given below, as part of the accident management plan (See BAT 1)* *a) Protection measures* *b) Management of incidental/accidental emissions* *c) Incident/accident registration and assessment system*
	An Accident Management Plan has been submitted with the application, (See Section 8 of this document, 'Emergency Procedures' that identifies: - • The likely causes of accidents; • The consequences of such accidents; • Prevention measures in place to reduce the likelihood of accidents; and • How any accidents that do occur will be managed. The potential for accidents and incidents hazards have been assessed and management techniques put in place as per: • The Activities & Operating Techniques (document ref.3982-CAU-XX-XX-RP-V-0305);

	• BAT assessment (this document); and, • Amenity and Accident Risk Assessment (document ref.3982-CAU-XX-XX-RP-V-0303). These documents have been prepared in support of this application, to ensure that in the unlikeliness of the any accidents or incidents occurring, the operator has sufficient contingency plans and management techniques to ensure they will not lead to an impact on the environment. The company Management system includes written procedures dealing with noncompliance. Any non-compliance will be reported to the site manager or foreman immediately. The site manager or their deputy will determine the course of action to be taken in accordance with the procedure. The company Management system includes written procedures for handling, investigating, communicating and reporting environmental complaints and implementation of appropriate actions. See Management System summary
	Material Efficiency
BAT 22	*In order to use materials efficiently, BAT is to substitute materials with waste*
	The activities on site requires of resources and raw materials as part of the treatment process, See Section 7 'Resources Use – Raw Materials'. Organic additive. Specific details regarding raw materials are provided in the Operating Techniques. The site will utilise the following raw materials: • Oil and fuels • Standard NPK fertilizer • leaves from road sweepings, organic woodchip, Use of the raw materials replaces virgin materials such as manufactured fertiliser or virgin woodchip and using waste raw materials which would otherwise be landfilled. The operator has in place as per requirement of the ISO140001 Environmental Management system: a) Procedures for the regular review of new developments in raw materials and any suitable replacements with an improved profile; b) Quality assurance procedures for controlling the impurity content; and, c) Waste minimization and less polluting options favored.

	Energy Efficiency
BAT 23	*In order to use energy efficiently, BAT is to use both of the techniques given below:* *a) Energy Efficiency plan* *b) Energy balance record*
	Energy requirements of the operation are not considered to be significant and there are no buildings proposed that would require energy-efficient services. The energy efficiency plan relating to techniques relevant to the installation including operating, maintenance and housekeeping measure are in place and covered under an Environmental Management System. Housekeeping measures including maintenance and operational procedures are in place for all areas of the site where the breakdown of machinery could lead to an impact upon the environment or compromise the operator's ability to undertake normal site activities. These measures will be reviewed every year to determine if additional energy savings could be made and will include: - • Switching off equipment when not in use; • Careful operation and maintenance of plant & equipment; • Regular cleaning of plant & equipment.
	General BAT Conclusion for the mechanical treatment of wastes **Emissions to air**
BAT 25	*In order to reduce emissions to air of dust, and of particulate-bound metals*
	N/A
	BAT Conclusions for the mechanical treatment in shredders of metal waste
	BAT Conclusions 26-28
	N/A

	BAT Conclusions for the treatment of WEE containing VFCs and/or VHCs
	BAT Conclusions 29-30
	N/A
	BAT Conclusions for the mechanical treatment of waste with calorific value
	BAT Conclusions 31
	N/A
	BAT Conclusions for the mechanical treatment of WEEE containing mercury
	BAT Conclusions 32
	N/A
	BAT Conclusions for the biological treatment of waste
BAT 33	*In order to reduce odour emissions and to improve the overall performance, NAT is to select the waste input.*
	See BAT 2 regarding the pre-acceptance, acceptance and sorting of waste.
BAT 34	*Emissions to air* *In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3, BAT is to use one or a combination of the techniques given below:* *a) Adsorption* *b) Biofilter* *c) Fabric filter* *d) Thermal oxidation* *e) Wet scrubbing*
	See Section 4.1 'Control of emissions- biofilter' and BAT 8 regarding the use of biofilter to reduce emissions to air.
BAT 35	*Emissions to water and water usage* *In order to reduce the generation of waste water and reduce water usage, BAT is required to use all of the techniques given below:* *a) Segregation of water streams*

	b) Water circulation *c) Minimisation of the generation of leachate*
	See BAT 3 and BAT 19 Water usage is minimal. Rainfall derived drainage water will be used for moisture control where required. Use of mains water restricted to washing plant etc. The waste discharge areas comprise of impermeable pads which drains to a collection pipework so that any runoff will be contained. There is no drainage to sewer at Daneshill Landfill site, waters will either be used within the process to maintain optimum moisture levels or stored in tanks awaiting collection and disposal to a suitable treatment facility.
	BAT Conclusions for the aerobic treatment of waste
BAT 36	*In order to reduce emission to air and to improve the overall performance, BAT is to monitor and/or control the key waste and process parameters.*
	See Section 2.6 'Bioremediation of Soil' and BAT 1, BAT 2
BAT 37	*Odour and diffuse emission to air* *In order to reduce the diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use or both of the techniques given below:* *a) Use of semipermeable membrane covers* *b) Adaption of operations to the meteorological conditions.*
	See BAT 10 and BAT 15 See Activities and Operating Techniques Report, document ref: 3982-CAU-XX-XX-RP-V-0305. For VOCs, see the Air Quality Impact Assessment (Appendix 2) For fugitive, dust and odour emissions, see the Air Quality Impact Assessment (Appendix 2) Odour Management Plan (document ref. 3982-CAU-XX-XX-RP-V-0308) and Amenity & Accidents Risk Assessment (document ref: 3982-CAU-XX-XX-RP-V-0303.
	BAT Conclusions for the anaerobic treatment of waste
	BAT 38

	N/A
	BAT Conclusions for the mechanical biological treatment (BMT) of waste
	BAT 39
	N/A
	BAT Conclusions for the physico-chemical treatment of solid and/or pasty waste
	BAT 40-41
	N/A
	BAT Conclusions for the re-refining of waste oil
	BAT 42-44
	N/A
	BAT Conclusions for the physico-chemical treatment of waste with a calorific value
	BAT 45-47
	N/A
	BAT conclusions for the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil
	BAT 48-49
	N/A
	BAT Conclusions for the water washing of excavated contaminated soil
	BAT 50
	N/A
	BAT Conclusions for the decontamination of equipment containing PCB's
	BAT 51
	N/A
	BAT conclusions for the treatment of waste-based liquid waste

	BAT 52-53
	N/A

Appendix 1

Management Procedures

Appendix 2

Air Quality Risk Assessment

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Table C
Asbestos Waste Codes

Table 1c: Wastes to be accepted for the physical-chemical treatment of asbestos wastes

17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances (contains identifiable pieces of bonded asbestos (any particle of size that can be identified as potentially being asbestos by a competent person if examined by the naked eye))
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 05*	construction materials containing asbestos (discrete pieces of bonded asbestos within the soil matrix only

Emissions Management Plan
January 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Emissions Management Plan

Prepared by:

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Document Reference: 3982-CAU-XX-XX-RP-V-0307.A0-C1

January 2021

APPROVAL RECORD

Site:	Daneshill Soils Treatment Facility
Client:	FCC Recycling (UK) Limited
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Document Title:	Emissions Management Plan
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Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

EMISSIONS MANAGEMENT PLAN

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1. INTRODUCTION

1.1 Report Context

1.1.1 FCC Recycling (UK) Ltd (hereafter referred to as the 'Operator') operate Daneshill Landfill Site, which is located approximately 2km east of Lound Village, Nottinghamshire at National Grid Reference SK6755086750.

1.1.2 Caulmert Limited were appointed by the operator to prepare an application to vary the existing permit to include a Soil Treatment Facility (STF) which will operate on a constructed treatment pad within the landfill site boundary. As part of the application, an Emissions Management Plan (EMP) is required.

1.1.3 Preparation of this EMP has been in consultation with the following Environment Agency (EA) guidance documents:

1.1.4 Technical Guidance Notes (Monitoring) M8 – Ambient Air. Environment Agency, Version 2 (May 2011); and

1.1.5 Technical Guidance Note (Monitoring) M17 – Monitoring Particulate Matter in Ambient Air around Waste Facilities. Environment Agency, Version 2 (July 2013).

1.1.6 The Operator proposes to add the following listed activities to the current permit:

- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.1.7 This EMP provides details of appropriate measures that are required for effective emissions management and control at the facility during construction and operational phases.

1.1.8 The Operator are required to submit a EMP to consider the impact of dust & particulate emissions on receptors as a result of the construction and operational activities of the STF. This EMP provides means of assessing the effectiveness of control measures. The proposed Emissions Action Plan should be implemented in cases of failure and emissions events.

1.2 Objectives

1.2.1 This EMP has the aim of ensuring that potential emission sources are identified and controlled at source where possible. The EMP aims to minimise the risk of emissions

impact at locations outside of the facility boundary. Potential emissions as a result of the soil treatment facility include:

1) Dust

2) PM10's

3) Asbestos fibres

4) Biofilter: VOC's (including BTEX), Speciated PAHs, TPH, PID

1.2.2 As a minimum this EMP will consider the following elements:

- An assessment of the risks of emissions at the Facility;
- Identify the appropriate controls to manage the identified risks;
- Prevent the emissions of dust, PM10 and asbestos fibres;
- Emissions monitoring;
- Identify actions, contingencies and responsibilities when emission problems arise; and
- Regular review of the effectiveness of the control and mitigation measures.

1.2.3 All internal and external storage and treatment areas will be designed so that they collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.

1.2.4 The EMP is supported by the procedures and controls established within the following documents:

- The Site Management Plan;
- The Site Operational Procedures; and,
- The Site Environmental Risk Assessment.

2.1 Site Setting

2.1.1 The proposed Soil Treatment Facility site is located within the footprint of Daneshill Landfill Site which is located approximately 2km east of Lound Village, 6km north-west of Retford and 11km north east from Worksop. The location of the proposed activity in relation to its surroundings is detailed in the Site Location Plan (3982-CAU-XX-XX-DR-V-1801).

2.1.2 The site is bordered to the north and east by agricultural land and mixed woodland and to the west. South-west are nature reserves and the Daneshill Lakes. The nearest residential dwelling to the site is Daneshill Cottages which lies approximately 75m to the south-west of the site and Loundfield Farm 200m east of the site.

2.1.3 The proposed location of the STF will fall within the current permit boundary of Daneshill Landfill Site; therefore, this application is not seeking to extend the permit boundary. The STF shall sit in the southern part of the site within the footprint of Daneshill Landfill Site as shown on drawing 3982-CAU-XX-XX-DR-V-1804.

2.1.4 The facility will be limited to accepting wastes that can be treated to a point where they can be used for restoration soils on the landfill.

2.2 Soil Treatment Operations

2.2.1 The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous containing visible bound pieces of asbestos and/or hydrocarbons and 20,001 tonnes of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The usual maximum biological treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

2.2.2 The treatment areas consist of 2 treatment pads measuring at 3450m^2 and 3500m^2 for biotreatment/physical treatment and another 1 x 48800m^2 treatment pad solely for screening/processing. An indicative operational layout of the treatment and processing area and cross section is detailed in drawing refs: 3982-CAU-XX-XX-DR-V-1805 and 3982-CAU-XX-XX-DR-V-1806.

Asbestos Storage

Upon satisfactory pre-acceptance and waste acceptance checks, on arrival to site, the soils will be weighed and directed from the weighbridge to the soils reception area and undergo an inspection and sampling for analytical testing. Soils will be stored on impermeable surfacing provided with bunded edges and sealed drainage. After placement on the storage area, the soils will be sheeted to reduce the potential for air borne emissions. The pre-assessment testing is carried out to confirm the soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Until the testing has been completed, the soils will remain sheeted. Following satisfactory results from pre-assessment confirming that the soils are compliant with the acceptance criteria,

the soil can be stored externally, un-sheeted and will undergo pre-screening and handpicking for asbestos fragments. Asbestos containing soils with fibres concentrations that has to potential to become airborne at concentrations above the air monitoring detection limit will be rejected from site. Soils that meet all waste acceptance checks will be formally accepted for treatment.

Pre-screening and Handpicking of asbestos containing soils

2.2.3 Following formal acceptance, only hazardous soils containing asbestos will under-go pre-screening and handpicking, where pre-screening will be carried out prior to hand picking. Soils will be screened using a three-way screening (0-15mm, 15-50mm and 50mm+). This is to reduce the potential of damage to the picking station and make hand picking of asbestos debris more effective. All stockpiles generated from the screening/hand-picking will be visually inspected for the presence of residual asbestos prior to being samples for further biotreatment or reuse.

2.2.4 The picking station will provide an enclosed working area for hand-picking, details of the station specification is included in Appendix 1 . A conveyor belt will be used on the picking line providing a smoother running line which will aid the hand picking process. Treatment will only commence when waste acceptance testing has confirmed that the asbestos fibres content in soils is lower than 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Handpicking of small asbestos fractions will only be undertaken by suitably trained operatives, with asbestos fractions placed directly in polythene asbestos bags. The bags will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin.

2.2.5 Dust suppression will be provided for the screener as a preventative measure, in addition, air monitoring will be carried out hourly to assess if there is any detection of asbestos fibres above the method detection limit.

Screening of non-hazardous soils

2.2.6 Following acceptance and valid pre-acceptance testing results to confirm chemical validity, non-hazardous soils will be placed into their respective treatment batches and undergo physical treatment. Non-hazardous soils will be screened to remove oversize inclusions prior to reuse to ensure they are physically suitable.

2.2.7 Following screening, the soils will be stockpiled for use in recovery at Daneshill Landfill Site, this may also include soils that have undergone bioremediation process to remove oversized materials.

Bioremediation Process Description

2.2.8 The biological treatment process varies between 8 to 16 weeks, dependent on the contaminants present in the soil.

2.2.9 Bioremediation of soils will be undertaken on a newly constructed GCL lined pad comprising sand blinding, crushed concrete and sealed drainage to allow pumping to

holding tanks. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully. As there is no drainage network on site, all process waters will be pumped to on-site holding tanks with any excess water tankered off to an appropriate disposal facility.

2.2.10 Soils accepted at the STF are deposited on the treatment area. The soils are arranged into biopiles using a system of batches which allows the waste to be trackable by age of waste and from the point of origin to its location on the treatment pad.

2.2.11 Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

2.2.12 Biodegradation of the organic contaminants is carried out by microorganisms in the soil. This is enhanced by addition of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Management of moisture content is also essential for microbial activity; low moisture content has the potential to inhibit microbial growth, but excessive moisture can restrict airflow. The perforated aeration pipes located beneath the waste will extract air from the biopile to effectively control waste oxygen levels and moisture content to maintain aerobic conditions.

2.2.13 Temperature in the biopiles is maintained between 30 and 40°C to ensure the mesophilic microflora are predominately stimulated, optimising biodegradation.

2.2.14 The stages of the bioremediation process are detailed below:

- Initial Placement: The soil is placed on the treatment pad by a tipper lorry/dump truck where an excavator will form the biopile.
- Addition of Nutrients: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.
- Chemical Analysis – Approximately every 4 weeks the soil is analysed for contaminant concentrations to determine whether the biological treatment of the soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process
- Nutrients testing – Every 2-4 weeks the soil is analysed for nutrient levels within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process.
- De-compaction of the soil – Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil. Reintroduction of treated water into the biopiles if emissions

(e.g. dust) is being generated or soils are outside of the optimal moisture content range

- Validation testing: Once the soil treatment is deemed complete it is sampled for laboratory testing to ensure that contaminants meet the landfill re-use criteria.

2.2.15 On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent landfill void or reused on site as restoration soils.

2.2.16 There are no direct releases off-site other than via the engineered surface water management system. The site will be engineered so that all collected surface waters and process waters from biopiles will pass into a drain at the lowest points of the treatment pad and transferred into holding tanks. The holding tanks will store all surface and process waters until emptied and disposed of at a suitable facility offsite.

3. POTENTIAL SENSITIVE RECEPTORS

3.1.1 The proposed STF site lies within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. The site is in a predominantly agricultural setting of which Loundfield Farm is located 500m to the east. Other nearby residential and domestic dwellings include a few properties and a traveller's site located on Daneshill Road. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

3.1.2 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

3.1.3 A review of the prevailing wind direction has identified that the most dominant wind is from the south-west/south-south-west towards north-east/north-north-east. The wind direction is likely to blow towards Mattersey Village, Loundfield Farm and agricultural fields. Given the distance from the site boundary and the transient nature of odours from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

3.1.4 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

3.1.5 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

3.1.6 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

3.1.7 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Traveller's Site	Residential	155m	SWS
Daneshill Road	Public road	250-500m	S, W, SW
Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

3.1.8 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

3.1.9 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

3.1.10 The site is not located within a flood risk zone.

4.1 Construction Phase

4.1.1 Fugitive emissions during the construction of building and developing all infrastructure associated with the Soil Treatment Facility

4.1.2 Emissions can arise from:

- Construction of treatment pads;
- Drop height of materials e.g. aggregates,
- Handling of aggregates and crushed concrete for surface preparation;
- Screening of non-hazardous soils to remove oversized materials;
- Movement of site vehicles on dusty surfaces; and,
- Crushed concrete dust/asbestos fibres on site vehicles.

4.2 Operational Phase

4.2.1 Fugitive emissions can result from the receipt of contaminated soils if the waste acceptance procedure for soil inputs is not correctly implemented or if emissions mitigation measures are absent.

4.2.2 Potential emission sources have been identified from the proposed operational activities:

- Delivery of waste to site;
- Vehicle movements;
- Deposit of soils on the appropriate treatment area;
- Potential dust, particulates and asbestos fibres as a result of soil screening and hand picking;
- Bioremediation of hydrocarbon contaminated soils including initial placement, aeration and turning; and
- Storage and transfer of oversize materials (e.g. concrete debris etc) removed from soil screening.

Potential Pathways

5.1 Airborne Pathways

5.1.1 It is considered the potential pathway for dust ,particulate and asbestos fibre emissions to sensitive receptors are via airborne transmission. Factors affecting emissions include:

- Quantity of wastes;
- Wind direction, exposure and speed; and,
- Exposure of sensitive receptor to site operations.

5.1.2 Meteorological data from Doncaster/Sheffield airport weather station (winderfinder.com) indicates that the prevailing wind is from the south-west, west-south-west and west towards the north-east, east, and east-north-east. These wind conditions are reflective of those likely to be experienced at Daneshill Soil Treatment Facility. A review of the sensitive receptors in Table 1 shows that the receptor likely to be impacted by emissions within 500m of the site boundary, is Loundfield farm which is located 495m east from the site boundary. However, given the transient nature of airborne emissions and the distance of this receptor from site, it is unlikely to be significantly impacted by emissions from site.

CONTROL MEASURES

6.1.1 The following control measures will be implemented to minimise the impact of emissions from Daneshill Soil Treatment Facility.

6.1.2 During the construction of the geo-composite clay lined crushed treatment pad, drop heights will be reduced to ensure there isn't any unnecessary or excessive dust & particulate plumes. Lorry drivers delivering hardcore and aggregates which will form the foundations of the impermeable base will be advised at the weighbridge to reduce drop heights to minimise the likelihood of dust & particulate emissions.

6.1.3 Haul and traffic movements roads can be dampened down as necessary, especially during dry and windy conditions by use of a site bowser. When leaving site, all vehicles will be required to pass through the wheel wash prior to exit.

6.1.4 All staff will be trained and aware of the effect of dust and particulate emissions and to carry out activities in a way that will minimise any plumes as a result of handling and developing the crushed treatment pad.

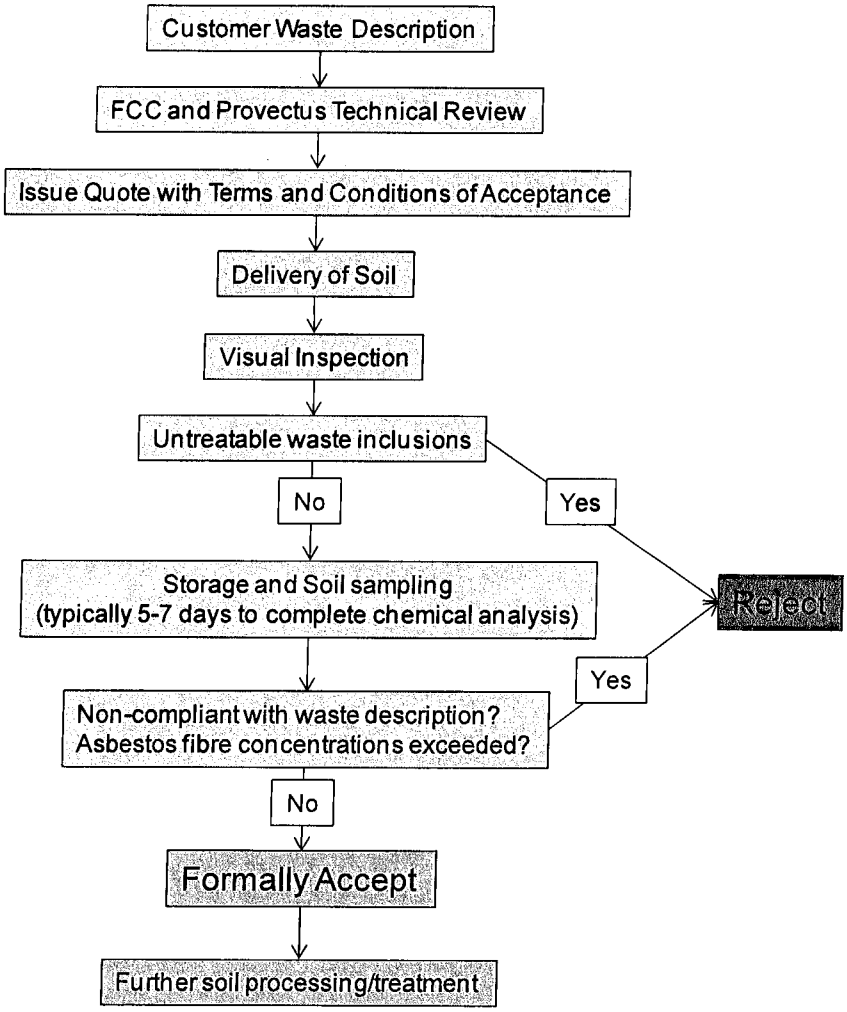
Pre-acceptance, Waste Acceptance and pre-assessment

6.1.5 In addition to FCC's Waste Acceptance Procedures, the site will operate in accordance to the Provectus 'STF – FO02- Soil Reception Procedure' (Appendix 2) which details specific procedures and measures for the pre-acceptance of hazardous soils, including rejection of non-conforming wastes. Form FO03 (Appendix 2) details the soil characterisation procedures and measure undertaken for sampling of soils received at the STF.

6.1.6 The weighbridge will conduct assessments of waste inputs and impose controls and restriction on potentially dusty waste (e.g. bagging, rapid cover following placement, refusal to tip).

6.1.7 Soil with asbestos will be consigned by contractors and haulier as 17 05 03* 'soils and stones containing hazardous substances' or 17 06 05* 'other construction materials containing asbestos'. All asbestos containing wastes will undergo visual inspection and chemical analysis to ensure that any soils that are formally accepted are suitable for further soil processing/treatment without the potential for any asbestos fibre emissions above the detection limit. A summary of waste acceptance is shown in Figure 1 below.

Figure 1: Summary of Waste Acceptance Procedures – Asbestos containing wastes



6.1.8 Unacceptable forms of asbestos containing wastes which will be rejected include:

- Asbestos pipe lagging;
- Loose asbestos fill;
- Asbestos insulation board; and,
- Soils with elevated asbestos fibres in any form that could result in airborne emissions above the detection limit (0.01f/ml) or reference background level (see Section 8 Monitoring).

6.1.9 Pre-assessment will be carried out to identify the asbestos fibre concentrations in soil, and to ensure that waste soils only containing identifiable pieces of bonded asbestos are subject to further treatment. This approach will eliminate the potential for airborne asbestos fibre emissions above the detection limit. Pre-assessment testing will confirm that asbestos fibre content is less than 0.01% for chrysotile asbestos and 0.01% for all other forms of asbestos. Any results above these levels will be rejected. During the storage time waiting for pre-assessment results, the soil will remain sheeted. Only on satisfactory laboratory results will the waste soils be un-sheeted. Air monitoring will be undertaken

during treatment of soils to provide reassurance that there are no airborne asbestos fibres present above the detection limit at all times.

Site Traffic and movement of vehicles

6.1.10 All site traffic will be kept to designated haul routes. The surface of internal haul routes will be inspected daily and swept when required with any defects made good.

6.1.11 Further standard good practices for haulage on site will include:

- Setting appropriate site speed limits and vehicle routes;
- Even loading of vehicles to avoid spillages;
- Ensuring even road surfacing and maintenance of potential potholes;
- Regular removal of spilled material from site haul routes; and,
- Dust suppression by regular spraying in dry conditions where there is the potential to generate dust and release of particulates and asbestos fibres.

6.1.12 A wheel wash is used to remove any debris or other deposits on internal roads to prevent drag out onto the public highway. In the event that drag-out is observed, then a road sweeper will be employed.

Waste Storage & Treatment

6.1.13 During particularly dry weather the storage areas will be dampened down as necessary. A tractor fitted with a bowser can be deployed during warm, dry and windy conditions to dampen down haul roads. The site will also be provided with dust & particulate suppression cannons which will spray a mist air to reduce the potential for airborne dust, particulates and asbestos fibres.

6.1.14 The soils will be stored on the impermeable pad that will be constructed with sealed drainage to onsite holding tanks.

6.1.15 The moisture content of the biopiles is maintained at a constant level to allow the bioremediation and subsequently minimise the dust, particulate and asbestos fibre potential. If soil is observed to be generating emissions on that biopile, it is an indicator that moisture content is too low. Irrigation of the biopile with treated water will then be implemented to rehydrate the soil to the correct moisture content levels thereby eliminating any potential emissions. Operational controls during the bioremediation process are in place to ensure no turning of the biopiles is undertaken during high winds.

6.1.16 On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust.

6.1.17 Drop heights will be minimised during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for dust and particulate release as a consequence of agitation.

6.1.18 All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance. A road sweeper will be regularly hired into clean site roads of any mud trailed on from site vehicles. Dampening of site roads/surfaces as necessary using a tanker/water bowser during dry periods will minimise dust.

Asbestos Screening and hand-picking

6.1.19 The control of asbestos emissions is predominantly based upon only receiving soils that are proven to pose no potential for airborne emissions of asbestos fibres above the detection limit. Asbestos fibres are not generated on site above the detection limit so no abatement system is required.

6.1.20 Soils with asbestos will be quarantined prior to formal acceptance even where in the majority of cases, soils have already been visually inspected and sampled prior to a formal offer for accepting the soils has been issued to the waste producer. The reception testing also includes for moisture content which will provide information on the dust potential in addition to the asbestos fibre quantification.

6.1.21 Reception testing will be undertaken at the receipt of soils and any soils that contain >0.1% chrysotile fibres, >0.01% other forms of asbestos fibres, or any form of unbound asbestos will be rejected from site. As an extra level of mitigation all externally stored asbestos contaminated soils will be covered prior to transfer to the internal building for screening and hand picking.

6.1.22 Within the asbestos soils storage and treatment areas, a dust suppression system is available to reduce dust and any particulate emissions. However, even without this operating and treatment activities operational there has never been an incidence of airborne asbestos being measured above the detection limit using Phase Contrast Microscopy (PCM) or if required to achieve a lower detection limit: Scanning Electron Microscopy (SEM) or Transmission Electron Microscopy (TEM).

6.1.23 Asbestos containing soils which has passed the pre-acceptance and waste acceptance will undergo a processing system comprising of a three-way soil screener according to the sizing fractions of; 0-15mm (fine fraction), 15-20mm (mid-range) and 50mm+ (oversized). Any soils with visible asbestos will go through further screening and hand picking to remove the asbestos element. All fractions will be visually checked for the presence of any residual asbestos debris before final resampling prior to biotreatment. Asbestos classified as 17 06 05 which has been removed from soils will be placed in a sealed, covered and lockable skip for onward disposal. Records of hazardous waste disposed from the site will be kept by the operator. The picking station will be an enclosed working area and dust suppression to reduce the potential for dust, particulate and asbestos fibre emissions. In addition, air monitoring will be carried during the pre-screening and hand-picking to confirm that asbestos levels are below the detection limit of 0.01f/ml. However, it is considered that due to pre-acceptance testing and previous experience, the risk of asbestos fibres being detected during air monitoring is extremely low. Monitoring in addition to the occupational

monitoring will be undertaken on a periodic basis to ensure compliance with the agreed background reference level for airborne asbestos.

Dust Suppression

6.1.24 During particularly dry weather the storage areas will be dampened down as necessary. A tractor fitted with a bowser can be deployed during warm, dry and windy conditions to dampen down haul roads. Misting suppression cannons will spray a mist air to reduce the potential for airborne dust and asbestos particulates. Misting cannons will be situated so that they concentrate spraying on storage, active and operational areas including the pre-screening and hand-picking for asbestos. The waters for dust suppression systems will be dosed with an asbestos surfactant additive which is a specially formulated solution which is capable of penetrating and "wetting out" amphibole (hydrophobic) forms of asbestos quickly and thoroughly. A copy of the MSDS sheets for the asbestos surfactant can be found in Appendix 3.

6.1.25 Dust generation is largely on haul roads and road sweeping/dust suppression is undertaken at source to prevent or minimise dust emissions occurring.

6.1.26 In addition, air monitoring testing will be carried out over an hour period to identify any elevated airborne asbestos fibres as a result of site activities to ensure compliance with occupational exposure reference standards. On a periodic basis this will be supplemented by background environmental monitoring that is undertaken for a longer period to achieve the lower background reference detection limit.

Bioremediation Process

6.1.27 The biopiles are operated using vacuum technology that means that >99% of volatile contaminants within soil pore spaces are collected and treated at the adjacent biofilter. Emissions from the biotreatment pad will be collected by undersoil pipework with liquids treated in the water treatment system and air treated by the biofilter. The conversion of hydrocarbons to carbon dioxide and water vapour means that the soil moisture concentration in soils is elevated during treatment and is rarely, if ever below 15-20%. Soil in treatment does not give rise to visible dust or elevated dust concentrations during treatment.

6.1.28 The bioremediation process in itself provides mitigation where the moisture content of the biopiles is maintained at a constant level either through the generation of water vapour within the pile or the reinstruction of treated water into soils to allow the bioremediation to continue optimally and subsequently minimising the risk for dust emissions. Operations controls are in place to ensure that no turning of biopiles in undertaken during high windy weather conditions.]

6.1.29 Air forced down through the biopiles via the extraction pipework system will pass through a biofilter before being discharged to air.

6.1.30 The blower connects to a manifold with several perforated pipes covered in stone above an impermeable surface. Overlying these pipes is oversize compost or woodchip mixture, nutrients and small amount of contaminated soil (<5%) to inoculate the biofilter placed to a height of approximately 1.5m. The compost/nutrient/soil mixture is overlain by an irrigation pipe network on top to maintain the moisture content and covered with a tarpaulin to ensure the biofilter does not dry out. It is then tested every month to ensure the process parameters remain within the optimal range. Olfactory odour checks are also undertaken daily. Biofilter emissions monitoring include monthly VOC's (including BTEX), Speciated PAHs, TPH, and bi-monthly photo-ionization detector (PID). Limits and thresholds of monitoring parameters are included in Table 2 'Emissions Monitoring'.

PM10 emissions from vehicles

6.1.31 The main sources of PM10 emissions on site are from:

- Excavators
- Dump trucks
- Tipper/articulated lorries

6.1.32 The additional storage areas will allow a one-way traffic system to be employed and avoid the vehicle restrictions and delays during delivery into the asbestos building. This will significantly decrease the time the lorry is present on site and result in a reduction in PM10 emissions.

6.1.33 PM10 emissions are largely from heavy plant and vehicle traffic. Emissions from vehicles delivering soils to site are to be reduced by having external reception areas rather than the existing system of delivering inside a building which often leads to queuing vehicles.

6.1.34 The use of a soil screener in the asbestos processing will result in a tenfold reduction in PM10 emissions compared to the existing emissions.

Off Site Emission sources

6.1.35 The Retford Ready Mix Limited Concrete Supplies are located 330m south from the site boundary across Daneshill Road. It is considered that given the wind direction, there is potential for the concrete supplies as a source of wind-blown dust and particulate matter. Dust and particulates emissions are most likely from accumulation on site roads and operating activities such as loading, unloading and bagging.

7.1.1 A risk assessment for dust, particulate and asbestos fibre emissions and the possible hazards has been considered in an Amenity & Accidents Risk Assessment, document reference:3982-CAU-XX-XX-RP-V-0303 which has been included within the permit variation application.

7.1.2 The risk assessment details the control and mitigation measures to minimise emissions from operations at Daneshill Soil Treatment Facility.

7.1.3 It is considered that the majority of emissions are prevented from occurring and do not require further mitigation after the initial suppression. Monitoring will provide verification to the effectiveness of the suppression carried out on site.

8.1 Baseline Background Monitoring

8.1.1 It is an established procedure to attain pre-operational baseline monitoring to form the basis when determining the air quality prior to any treatment activities and the issue of the permit The operator will obtain baseline background monitoring prior to the commencement of operations where 3 rounds of monitoring will be taken at locations shown on drawing ref: 3982-CAU-XX-XX-DR-V-1803.

8.1.2 Following issue of the permit, the operator will be able to compare the monitoring results against reference background levels obtained from baseline monitoring. The background reference levels will be used as an action level should there be any soils with elevated asbestos fibres above the detection limit (0.01f/ml) or reference background level.

8.2 Schedule

8.2.1 Emissions monitoring will be undertaken in order to assess the effectiveness of the operational management and mitigating control measures at the STF. Monitoring will identify the potential for nuisance emissions to impact the nearby receptors, and the appropriate remediation measures required. Environmental monitoring locations are detailed in the Dust and Asbestos Monitoring Plan, drawing ref; 3982-CAU-XX-XX-DR-V-1803. PM10 will be undertaken around the working areas with a handheld decide.

8.2.2 Daily visual air monitoring during the soil processing works will be carried out to ensure that site activities do not increase emissions.

8.2.3 Monitoring will be undertaken by designated staff that will be fully trained by Site management. All site personnel will be responsible for reporting any problem emissions identified during their day to day operations.

8.2.4 Monitoring at the Facility will consist of the following detailed in Table 2 Below:

Table 2: Emissions monitoring

Parameter	Frequency	Thresholds	Comments
Asbestos (TCM)	Daily during initial soil screening	<0.01f/ml *Asbestos monitoring at locations around the STF during soil screening over 2 hour period *Pumped sampling >1m above ground level Flow rate = 4 litres/minute,	Method as described in M17 guidance and Table S3.3. This frequency is far in excess of other similarly permitted facilities. Monitoring undertaken around the treatment during soil screening process.

		minimum sample volume 480 litres, filter pore size = 1.2 µm asbestos fibre limit of detection = 0.001 fibres/ml	
Asbestos (SEM)	Quarterly	Supplementary asbestos monitoring at boundary locations (see drawing ref: 3982-CAU-XX-XX-DR-1803) to ensure compliance with an agreed background reference level.	Added reassurance to ensure baseline of asbestos emissions is not changing. Method is as described in M17 guidance. Detection limit anticipated to be <0.0005f/ml. This monitoring is far in excess of other similarly permitted facilities. Pre-operational background monitoring will be carried out at locations shown on 3982-CAU-XX-XX-DR-V-1803. 3 rounds of monitoring will be taken prior to the commencement of activities at site and prior to the issue of the permit.
Dust	Monthly	200mg/m2/day On Site checks and off site check in response to an issue being identified. Dust monitoring at locations onsite using Frisbee dust gauges,	Frisbee dust gauge method as described in M17 guidance. Daily on-site checks (or more frequently following dust complaints, or during prolonged dry or windy conditions)
Soil moisture content	Reception testing of soils as per	15% moisture content	To ensure soils received have low potential for dust release
Asbestos content in soils	Reception testing of soils	<0.1% chrysotile, <0.01% other types of asbestos fibres. No visible unbound asbestos or insulation	To ensure soils received cannot generate airborne emissions of asbestos above the method detection limit
PM_{10}	Weekly or as required if dust is suspected	250µg/m3/15 minute TWA*	Use of handheld nephelometer – not used for compliance against EU Directive Limit for PM_{10} as stated in EA Guidance M8, but provides real time results for implementing immediate mitigation if results are within 25% of threshold. A handheld mobile device for discrete monitoring around working areas. This method is preferred to support operational control of emissions rather than a fixed monitoring system for general air quality analysis at fixed locations (e.g. Filter

			Dynamics Measurement System/Beta Attenuation Monitor)
Biofilter Monitoring	6 monthly	Ammonia 20mg/m3 TVOCSs 40mg/,3 Hydrogen Sulphide (No Limit set)	Hourly mean Biofilter Monitoring taken at the treatment facility. Monitoring of moisture content, flow rate, nutrient levels and contaminant elimination (monitoring frequency as required).
VOCs	Weekly or as required	1mg/m^3 benzene	Use of calibrated PID around working areas on biotreatment pad. For ensuring RPE requirements are respected and biofilter is not overloaded with VOCs from incoming soils.
Odour	Daily	Absent	To ensure site activities do not cause nuisance

8.3 Air Quality - VOCs limits

8.3.1 Limits of VOC were derived from the applicant providing a full 20 months of monitoring data for the biofilter at their Rowley Regis site that will be replicated at Daneshill Soil Treatment Facility. The biofilter design and site operations will be the same and therefore emissions are predicted to be the same. Copies of analyses from the Rowley Regis site are included in Appendix 5 for information.

8.3.2 It can be seen that the average annual point source emissions at the biofilter are below public health protection benzene standard of 5 $\mu g/m^{-3}$ as an annual mean. The average annual concentrations during 2018 were 2.81 $\mu g/m^{-3}$ (conservative as assumes results shown as less than detection level were at detection level) and during the first 9 months of 2019 results were all below 5 $\mu g/m^{-3}$ and mostly below detection level at the biofilter demonstrating protection to nearby receptors.

8.4 Photo-Ionisation Detector Measurements

8.4.1 A photo-ionisation detector (PID) shall be used on a bi-monthly basis at around the perimeter and near the biofilter (6) to quantify gaseous emissions. If PID readings for Benzene exceed 1ppm (based on EH40 guidance), then the source shall be identified and assessed by the operator. It will be dealt with, for example, increasing PPE levels on site, a cessation of soil movement or covering of odorous soils with a tarpaulin etc.

8.4.2 If site activity involves the movement of soil that has been identified as containing high concentrations of VOC which may be harmful to personnel working in the vicinity or other off-site receptors, then PID and benzene monitoring shall occur on a daily basis.

8.4.3 Results are recorded in the on-site database system. Detail of the frequency and thresholds of monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

8.5 Meteorological Monitoring

8.5.1 It is considered that the principle mechanism for the transit of emissions from site activities to nearby sensitive receptors is likely to be via airborne. Meteorological conditions will heavily impact and determine the level of risk and exposure to sensitive receptors. The following factors are likely to influence the risk:

Wind Direction & speed

8.5.2 The dominant wind direction determines which receptors are likely to be impacted and levels of exposure. Wind speed will affect the likely distances odours can be transported, however, in contracts increased wind speed is likely to dissipate odours.

Ambient air temperatures

8.5.3 Higher temperatures and warmer conditions can result in an increased risk of odour emissions from site. Staff will be trained to be vigilant of meteorological conditions and those likely to encourage odour emissions.

8.5.4 In the event of an emissions complaint, conditions will be assessed against the complaint and details of site activities/operations carried out during the time of that complaint. Meteorological information will be recorded on the Complaints Form.

8.6 Emissions Monitoring

8.6.1 Prior to the operation of the facility, asbestos monitoring will be undertaken at locations shown in drawing ref: 3982-CAU-XX-XX-DR-V-1803 to establish an agreed background reference level for asbestos in accordance with EA technical guidance document M8 and M17. The agreed reference level will be used for periodic monitoring on a quarterly basis to ensure no increase in asbestos concentration in air above the background reference concentration.

8.6.2 Dust and Asbestos monitoring during the operations on site will be undertaken at environmental monitoring points onsite using Frisbee dust gauges to measure for deposited dust, their locations are shown in the Dust and Asbestos Monitoring Plan;3982-CAU-XX-XX-DR-V-1803. Limits and frequency of monitoring will be as per the existing permit. The air extraction system will be regularly monitored and maintained. The biofilter will be monitored for the following parameters on a monthly basis for VOCs (including BTEX), Speciated PAHs and TPH. PID will be carried out bi-monthly.

8.6.3 The air sample analysis undertaken before and after the biofilter demonstrates that ~99% of monitored contaminants are continuously removed during the operation of the STF. The biofilter is operational 24 hours per day.

8.6.4 The biofilter will also be regularly checked and maintained to ensure appropriate media particle size, temperature and moisture content. Equipment will be calibrated in accordance with manufacturer's instructions or as agreed with the Environment Agency. These procedures will maintain and effective air extraction system, reducing odour

emissions and identifying any leaks or damage for repair. Compliance with this requirement will be demonstrated by the monthly biofilter monitoring and regular VOCs monitoring at the site.

8.6.5 As part of the daily inspections, appropriately trained and experienced site personnel will carry out an on-site inspection to monitor visual dust, particulates, and asbestos fibres emission generation, which will be recorded on the daily inspection form. The records of the site daily inspections will be made available to the EA on request.

8.6.6 Visual monitoring will include observing the movement of vehicles, stockpiling and movement of materials, to establish if such operations are giving rise to emissions and the size and frequency of these releases.

8.6.7 The frequency of site inspections will be increased when site activities with a high potential to produce emissions are being carried out and during prolonged dry or windy conditions.

8.6.8 In the event that visual emissions are observed to be crossing the site boundary or surfaces are becoming soiled, the site management will be informed immediately and the approximate location and extent of a dust/particulate plume, or deposition, assessed and site operations reviewed and remediated.

8.6.9 Asbestos monitoring will be carried out by placing air pumps around the perimeter of the working area whilst soil screening is being undertaken, locations of the pumps will be determined by wind direction on the day of sampling. Asbestos monitoring will only be undertaken during periods when asbestos contaminated wastes are being accepted and treated.

8.6.10 PM10 Monitoring will be carried out in working areas and carried out weekly (and or when dust is suspected). Equipment will consist of a handheld nephelometer mobile device for discrete monitoring.

9. ENGAGING WITH THE NEIGHBOURS

9.1 Complaints Procedure

9.1.1 As part of this EMP, engagement with the neighbours will be undertaken.

9.1.2 Typically, any complaints received at the site are likely to be through the Environment Agency or Local Authority although the operator is willing to deal directly with the complainants and where necessary the following can be implemented:

- Information can be provided to the local neighbours (via the Environment Agency) regarding the point and method of contact for the Facility in the event that fugitive emissions has been detected or they want to discuss any activities at the Facility.
- The neighbours can be advised that any complaints / concerns will be addressed immediately following identification / notification and contingency action implemented.
- The neighbours can be advised of any corrective action and a follow up call carried out if required.

9.1.3 The Operator will continue to maintain a routine liaison with the Environment Agency regarding nuisance emissions from site. In the event of an emissions complaint being received by the EA the complaint is passed to the Operator for the investigation. The primary point of contact at the site for complaints and liaison within the neighbours is the Site Manager who will ensure that the recording, investigation and close out of complaints is undertaken as described below and in accordance with company management procedures. Every complaint will be recorded on FCC Recycling internal system as below:

- All complaints are recorded by the site manager or site staff on the FCC 'Safeguard' online incident recording system, describing the complaint and severity;
- The complaint can be forwarded to the Regional Environment Manager to undertake further investigation;
- Depending on the severity, the complaint can be escalated to senior management for investigation if necessary; and,
- The system is a digitalised process and records a wide range of reporting.

9.2 Complaints Monitoring

9.2.1 Any complaints received directly by the Facility or via the Regulatory bodies, including the EA and Local Authority, will be recorded on the FCC 'Safeguard' online incident recording system. This will instigate emissions monitoring at the location of the complaint and on site to determine the source and extent of the plume.

9.2.2 If necessary, monitoring will also be carried out at the nearest sensitive receptors to the Facility and the monitoring results recorded.

10. REMEDIAL ACTION PLAN

10.1.1 Following receipt of a complaint or identification of visual emissions at the STF which may give rise to an offsite impact the following action plan will be undertaken, including:

- Additional monitoring as detailed above to identify the extent of the impact and potential cause and source;
- Examination of the operational activities at the Facility at the time of the complaint or identification of an impact;
- Examination of the meteorological conditions at the time of the complaint or identification of an impact;
- Carry out a review of the operational procedure and process controls as detailed in Section 4 and instigate any control measures immediately following identification of the problem;
- Further monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

10.2 Record Keeping and Reporting

10.2.1 The Complaints Form will be completed, and the forms will be maintained free from damage and kept within the Site office and will be made available to the regulating authorities on request. The record keeping will form part of the Facilities Management System.

10.3 EMP Review

10.3.1 This EMP will be reviewed by site management on a regular basis as a minimum to ensure that the controls described are effective and reflect best available techniques. The EMP will also be reviewed following a number of complaints at the Facility or relevant changes in the site operations or procedures.

DRAWINGS

P02	RECEPTOR BOUNDARY INCREASED	EJD	KB	AS	25.11.20
P01	ISSUED FOR INFORMATION	EJD	KB	AS	12.11.19
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: 1000m SENSITIVE RECEPTOR PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A1	JOB REF.	REVISION
04.11.2019	1:2500	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1800

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NOTE

AREA OF PROPOSED ACTIVITY

REV	MODIFICATIONS	BY	AS	DATE
P2	ISSUED FOR INFORMATION	EJD	KB	AS	22.12.19
P1	ISSUED	KB	KB	KB	14.11.19

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SITE LOCATION PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	KB	KB	KB

DATE	SCALE @ A1	JOB REF	REVISION
14.11.2019	1:10000	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1801

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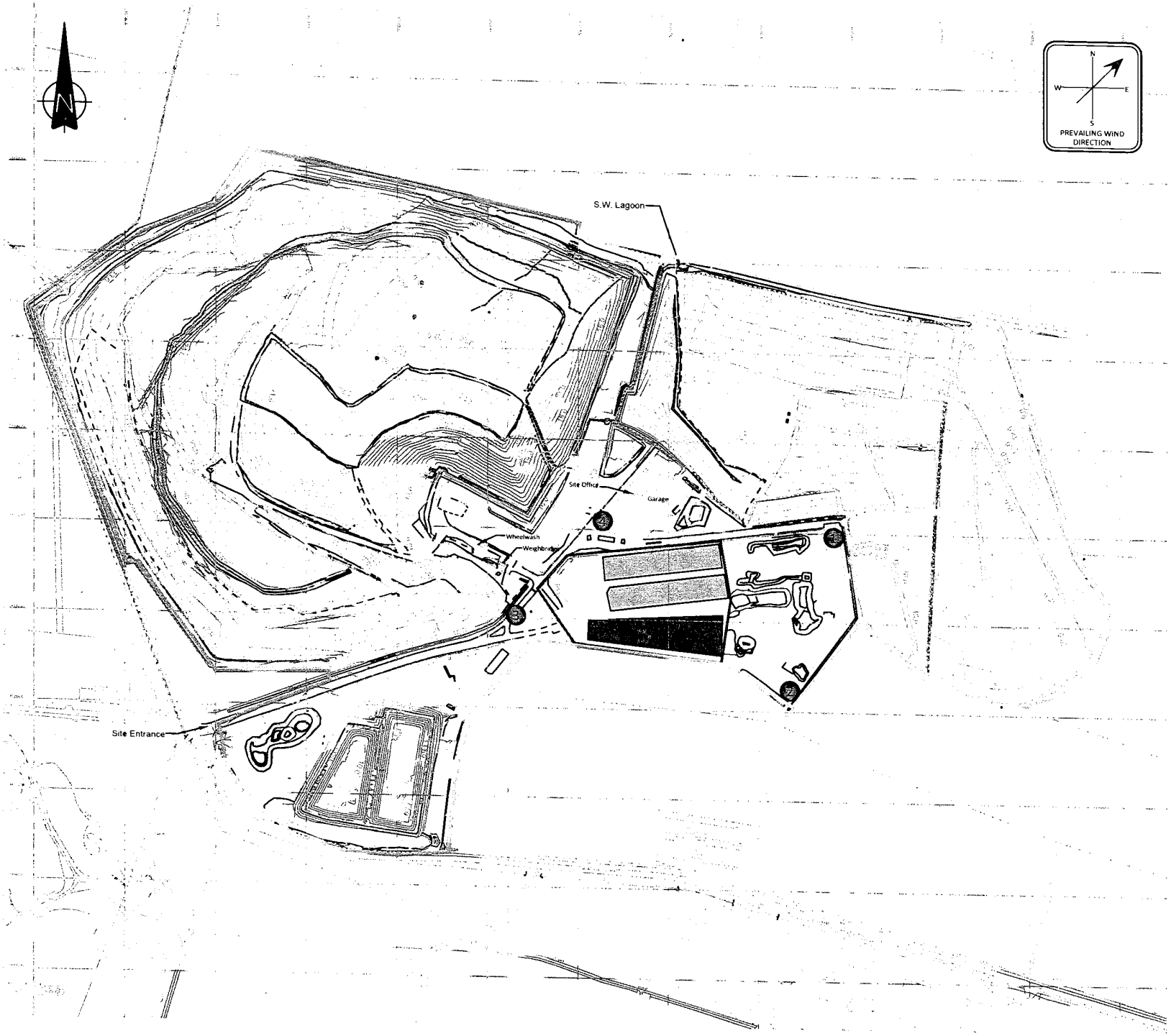

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LEGEND

- COMBINED DUST AND ASBESTOS MONITORING POSITIONS
- AREA OF PROPOSED ACTIVITY
- PERMIT BOUNDARY
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING AREA

P07	MONITORING POINTS AMENDED TO P04	EJD	KB	AS	18.01.21
P06	ENVIRONMENTAL MONITORING POINTS ADDED	EJD	KB	AS	15.01.21
P05	MONITORING POINTS UPDATED	EJD	KB	AS	26.11.20
P04	LEGEND UPDATED	EJD	KB	AS	24.03.20
P03	MONITORING POINTS UPDATED	EJD	KB	AS	03.02.20
P02	MONITORING POINTS UPDATED	EJD	KB	AS	09.12.19
P01	ISSUED FOR INFORMATION	EJD	KB	AS	05.12.19
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: DUST AND ASBESTOS MONITORING PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF	REVISION
04.12.2019	1:4000	3982	P07

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1803

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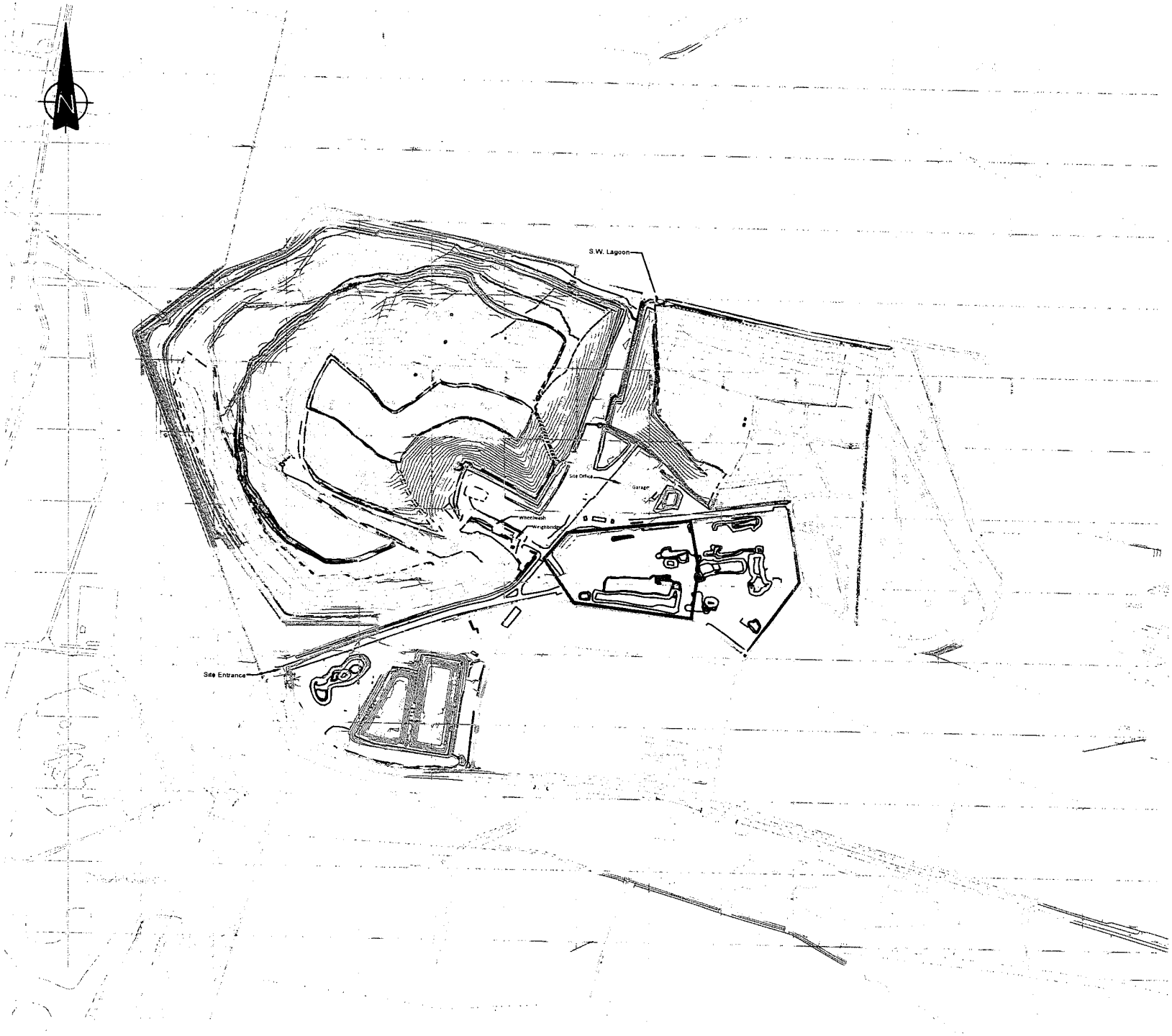

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LEGEND

PERMIT BOUNDARY

AREA OF PROPOSED ACTIVITY

REV					
P1	ISSUED FOR INFORMATION	EJD	KB	AS	03.02.20
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SITE BOUNDARY PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	**SCALE @ A3**	**JOB REF.**	**REVISION**
17.12.2019	1:5000	3982	P1

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1804

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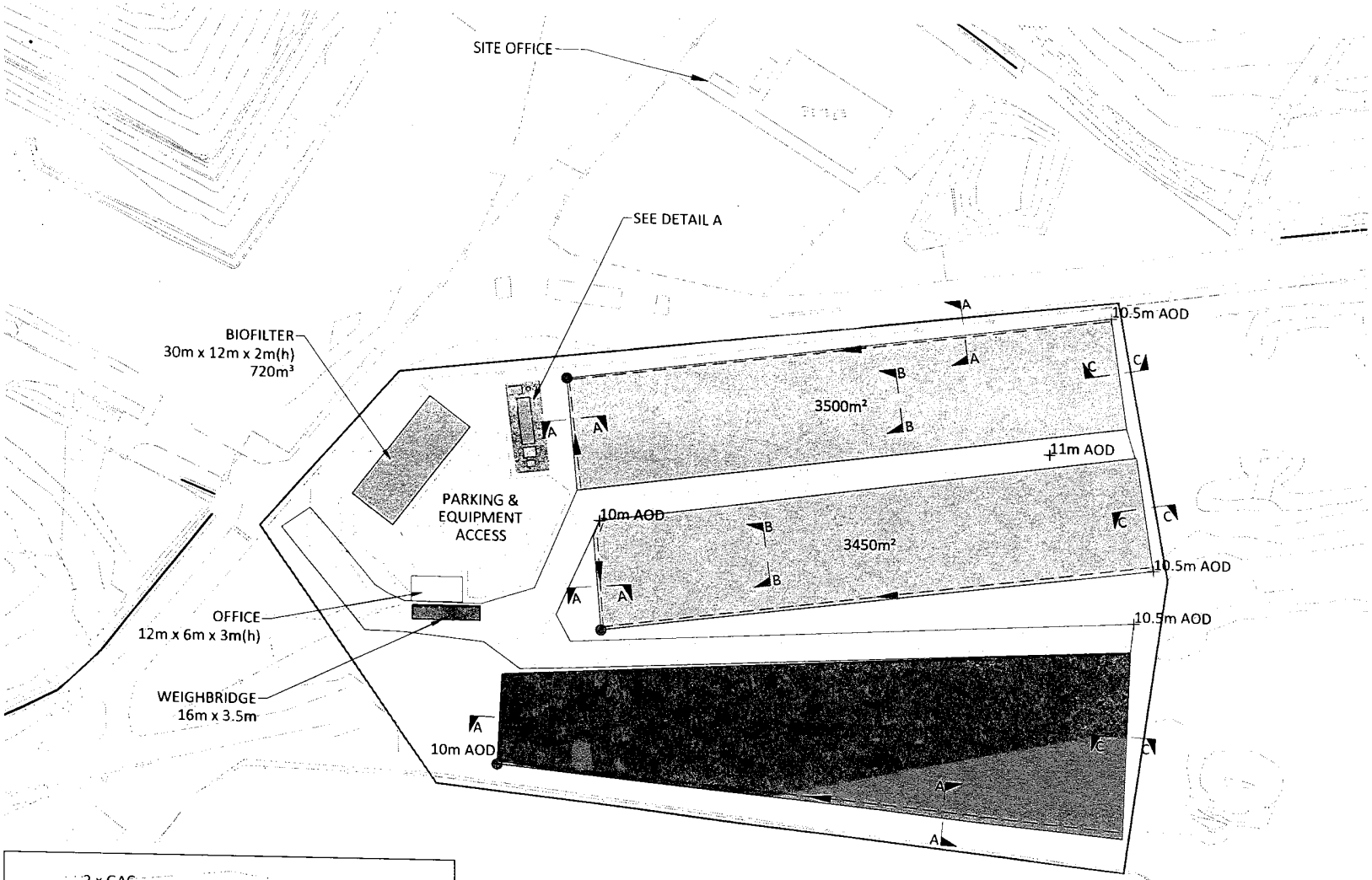

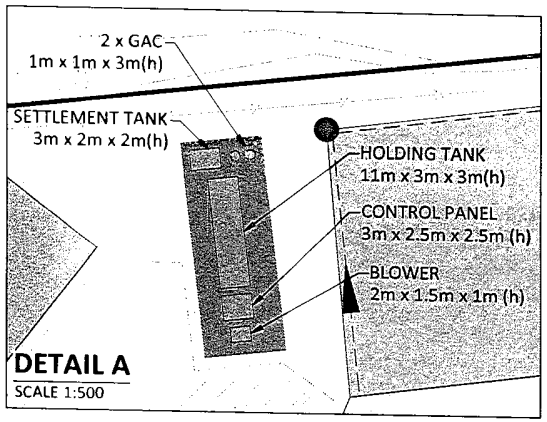

DETAIL A
SCALE 1:500

SITE LAYOUT
SCALE 1:1000

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1
4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- SECTION LINES
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING
- ACCESS ROAD
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P2	LEGEND UPDATED	EJD	KB	AS	24.03.20
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: PROPOSED LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC
DATE	SCALE @ A3	JOB REF	REVISION
04.02.2020	AS SHOWN	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1805

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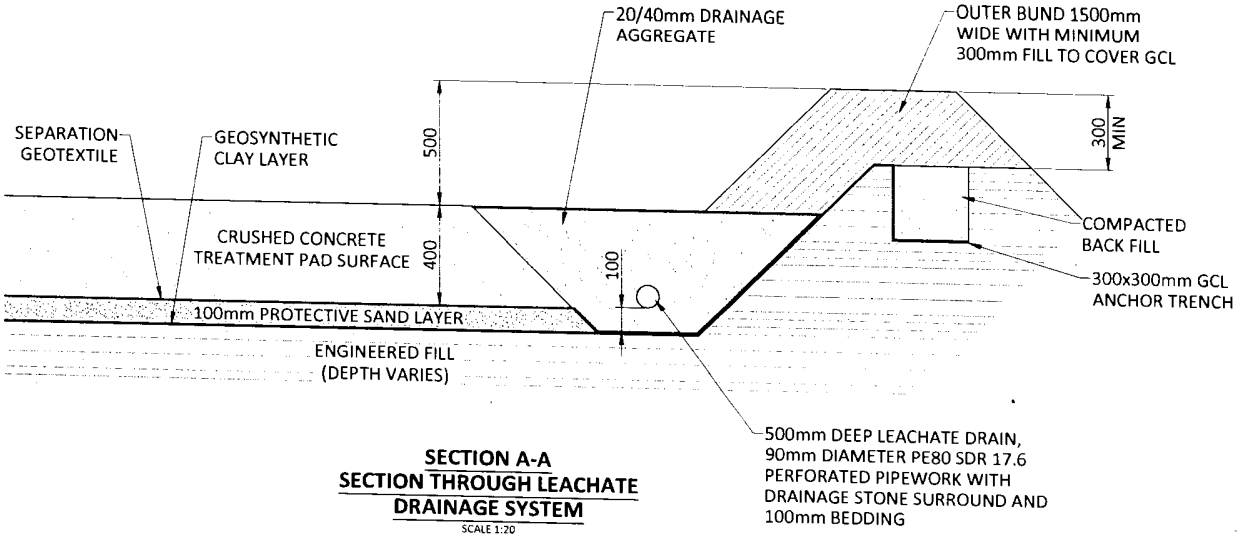
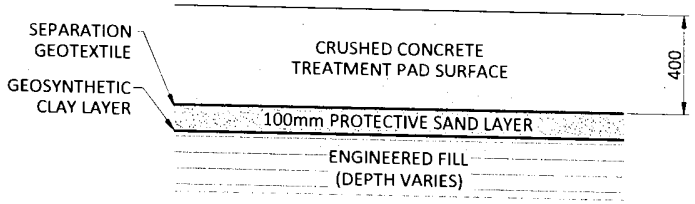
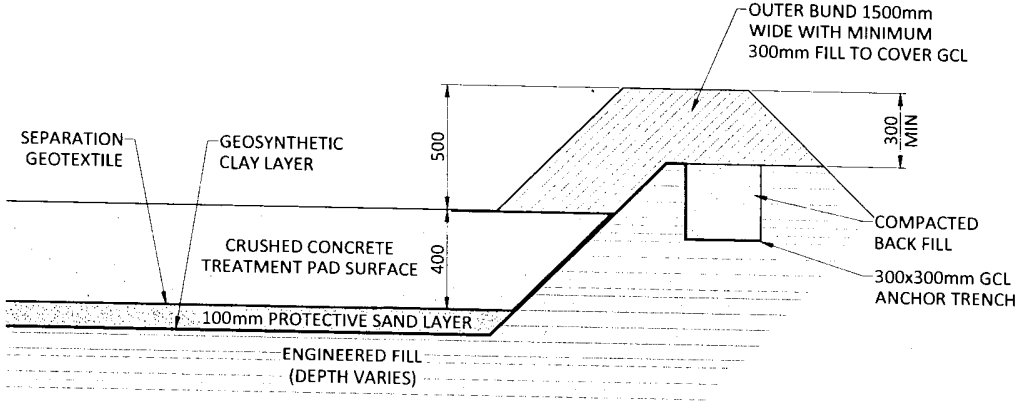


SECTION A-A
SECTION THROUGH LEACHATE DRAINAGE SYSTEM
SCALE 1:20



SECTION B-B
SECTION THROUGH TREATMENT PAD
SCALE 1:20



SECTION C-C
SECTION THROUGH TREATMENT PAD & EDGE BUND
SCALE 1:20

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3. SECTIONS POSITIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1805

REV	MODIFICATIONS	BY	RE	AP	DATE
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SECTIONS DRAWING

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JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF:	REVISION
05.02.2020	AS SHOWN	3982	P1

DRAWING NUMBER: 3982-CAU-XX-XX-DR-C-1806

Caulmert engineering planning

WWW.CAULMERT.COM

Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG Company Registered No: 06716319

APPENDIX 1

CRS NI LTD

COMPLETE RECYCLING SYSTEMS

Specification
Ref: CRS-045-SITE MASTER

COMPLETE RECYCLING SYSTEMS

T: +44 (0) 28 8076 0496
E: Marketing@crsni.com
W: www.crsni.com

Office Address: 136 Termon Road, Carrickmore, County Tyrone,
BT79 9HW, N.Ireland

CRS NI LTD

COMPLETE RECYCLING SYSTEMS

SALE OR HIRE

UNPARALLELED PERFORMANCE

Designed For Building & Construction Sites To Retrieve Valuable Products From Waste Reducing What Goes Into Your Skip.

Features & Benefits

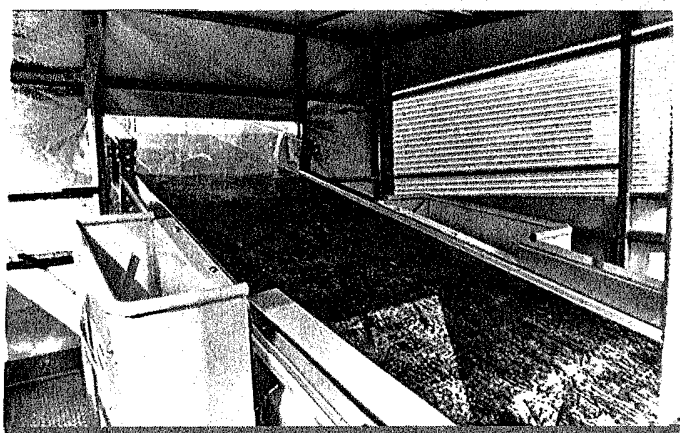
- Mobile 2 - 4 Man pick
- Designed for Building & Construction Sites
- Retrieve Valuable Products from waste
- Cut Down on what goes into your skip
- Adjustable Height
- Canopy for Weather Protection
- Economical Simple Design
- Electric Drive
- Robust & Heavy Duty Build

CRS NI LTD

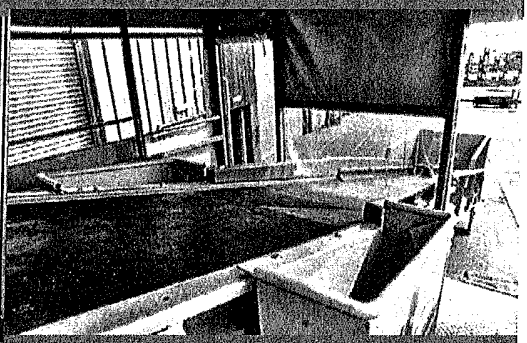
COMPLETE RECYCLING SYSTEMS

SALE OR HIRE

UNPARALLELED PERFORMANCE



- Fully Mobile
- Easily Transported Around And Between Sites
- 2 to 4 Man Picking
- Low Cost To Run



- Low Maintenance
- Reduce Skip hire cost

OPTIONS

- Hydraulic Drive
- Air Brakes
- Hard Cover
- Chevron Belt
- Radial Stockpiler

CRS NI LTD

COMPLETE RECYCLING SYSTEMS

Sales:

E: sales@crsni.com

www.crsni.com

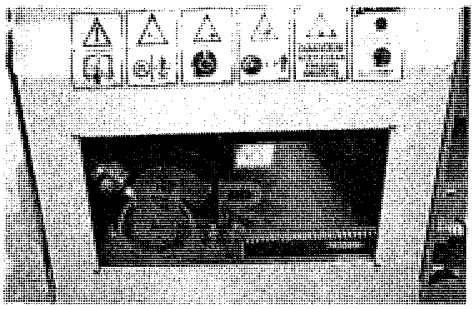
1.0 Conveyor

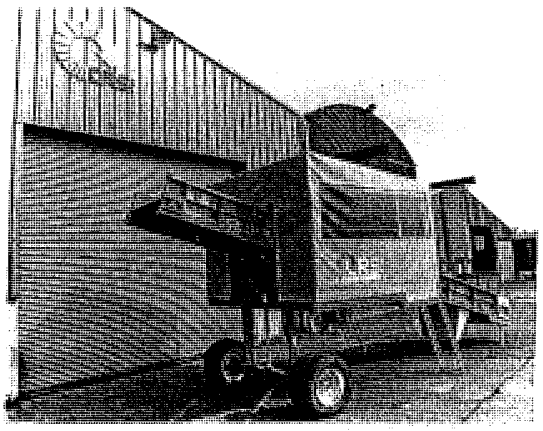
Feature

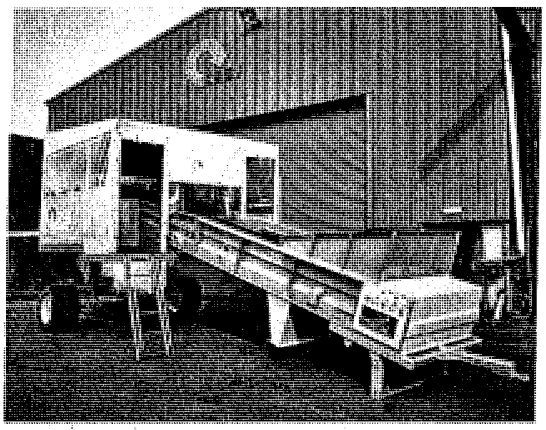
- Heavy duty profile steel construction
- Specially designed 8mm and 5mm steel profile to produce high strength section
- Typically 3 times stronger than traditional 6mm channel designs

Technical Specification

- 1000mm wide heavy duty rubber belt
- EP500/3ply – 5mm top cover 1.5mm bottom cover
- 8.5m drum centres
- 3.0kW Hi Torque Motovario slip on gear motor drive
- 100mm dia carry rollers placed at 875mm centres
- 100mm dia disc return rollers placed at 2115mm centres
- Head and Tail are fully enclosed to reduce spillage
- High sides incorporated into conveyor with skirting rubber
- Impact bars at infeed boot
- Plough scraper at Tail to reduce material build up
- SKF 50mm bearings (Tail)
- SKF 60mm bearings (Head)
- 288mm dia crowned and lagged drum
- 220mm dia crowned tail drum
- Rosta belt scraper tensioner with polyurethane rubber
- Perspex window at each maintenance point along conveyor
- Dirt chute at tail under plough scraper
- Support legs
- Full guards with emergency stops



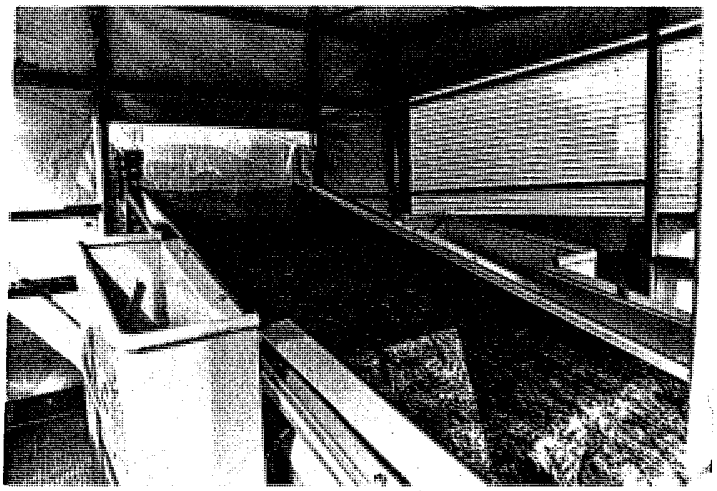


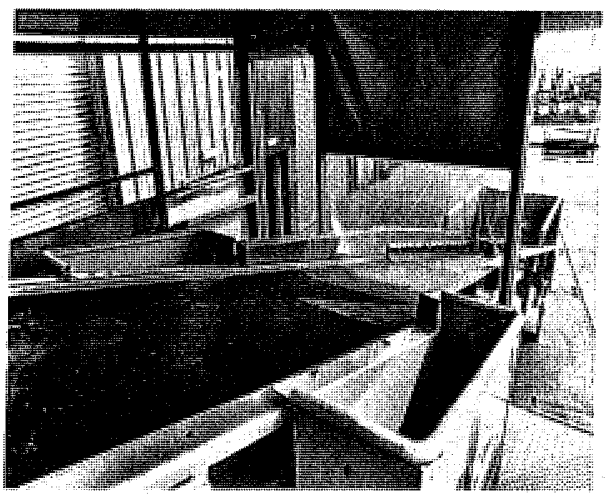


2.0 Picking Station

Feature

- 2-4 Man Picking
- 3.5mm Chequered Walkway
- 2 Dropboxes:
  - Width: 900mm
  - Depth: 452mm
  - Height: 989mm
- Access Step Ladders to Picking Station
- Canopy for Weather Protection
- Optional Hard Cover

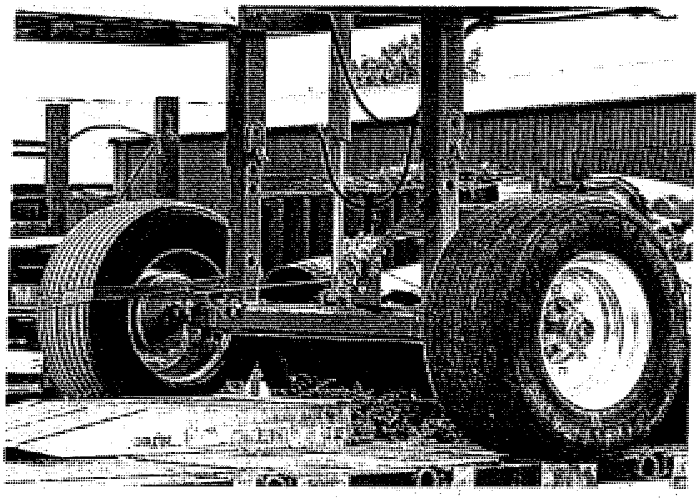




3.0 Wheel Assembly

Feature

- Adjustable Ram
- Handbrake Lever
- 300x80mm Stud Axle
- Super Single Tyres - 385/65 R22.5



APPENDIX 2

Evergard

SAFETY DATA SHEET

EVERGARD WETTING AGENT

Compilation date: 11/04/2017

Revision No: 1

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: EVERGARD WETTING AGENT

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.3. Details of the supplier of the safety data sheet

Company name: SMH Products Ltd
SMH House
Maxwell Street
South Shields
Tyne & Wear
NE33 4PU
Tel: 0191 456 6000
Fax: 0191 456 7777
Email: enquiries@smhproducts.com

1.4. Emergency telephone number

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Aquatic Chronic 3: H412

Most important adverse effects: Harmful to aquatic life with long lasting effects.

2.2. Label elements

Label elements:

Hazard statements: H412: Harmful to aquatic life with long lasting effects.

Precautionary statements: P273: Avoid release to the environment.

P501: Dispose of contents/container to hazardous or special waste collection point.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

[cont...]

Hazardous ingredients:

STEOL CS-230

EINECS	CAS	PBT / WEL	CLP Classification	Percent
-	-	-	Eye Dam. 1: H318; Skin Irrit. 2: H315; Aquatic Chronic 3: H412	1-10%

PRIMARY ALCOHOL ETHOXYLATE

614-482-0	68439-46-3	-	Eye Dam. 1: H318; Acute Tox. 4: H302	<1%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so.

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Turn leaking containers leak-side up to prevent the escape of liquid. Mark out the contaminated area with signs and prevent access to unauthorised personnel.

[cont...]

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area. Avoid the formation or spread of mists in the air.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. The floor of the storage room must be impermeable to prevent the escape of liquids.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Workplace exposure limits: No data available.

DNEL/PNEC Values

Hazardous ingredients:

STEOL CS-230

Type	Exposure	Value	Population	Effect
DNEL	Dermal	2750	Workers	Systemic
DNEL	Inhalation	175	Workers	Systemic
DNEL	Oral	15	General Population	Systemic
DNEL	Dermal	1650	General Population	Systemic
DNEL	Inhalation	52	General Population	Systemic
PNEC	Fresh water	0.24	-	-
PNEC	Marine water	0.024	-	-
PNEC	Fresh water sediments	0.9168	-	-
PNEC	Marine sediments	0.0917	-	-

[cont...]

PNEC	Soil (agricultural)	0.946	-	-
PNEC	Microorganisms in sewage treatment	10	-	-

8.2. Exposure controls

Engineering measures: The floor of the storage room must be impermeable to prevent the escape of liquids.

Respiratory protection: Respiratory protection not required.

Hand protection: Protective gloves.

Eye protection: Safety glasses.

Skin protection: Protective clothing.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Colourless

Odour: Characteristic odour

Viscosity: Non-viscous

pH: 3.00

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.

Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

[cont...]

11.1. Information on toxicological effects

Hazardous ingredients:

STEOL CS-230

DERMAL	RAT	LD50	>2000	mg/kg
ORAL	RAT	LD50	>2000	mg/kg

PRIMARY ALCOHOL ETHOXYLATE

ORL	RAT	LD50	>200<2000	mg/kg

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

STEOL CS-230

ALGAE	48H EC50	27.7	mg/l
DAPHNIA	48H EC50	7.4	mg/l
FISH	96H LC50	7.1	mg/l

PRIMARY ALCOHOL ETHOXYLATE

FISH	96H LC50	1-10	mg/l

12.2. Persistence and degradability

Persistence and degradability: Not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: Bioaccumulation potential.

12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

[cont...]

12.6. Other adverse effects

Other adverse effects: Toxic to aquatic organisms. Toxic to soil organisms.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: H302: Harmful if swallowed.

H315: Causes skin irritation.

H318: Causes serious eye damage.

H412: Harmful to aquatic life with long lasting effects.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

[final page]

APPENDIX 3

STF – FO02 - SOIL RECEPTION PROCEDURE

Document No:	STF - RR - FO02	**Issue No:**	2
Author:	Jon Owens	**Approved By:**	Steve Langford
Issue Date:	19/01/18	**Approval Date:**	19/01/18

Introduction

This procedure relates to the measures to be undertaken for the assessment of data and inspection of waste received at the soil treatment facility. It allows rejection of non-conforming waste to ensure no contaminated soils are accepted which cannot be treated by the treatment facility to a standard suitable for reuse, or which breach the list of permitted wastes as shown in the site's Environmental permit.

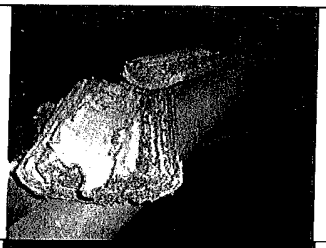
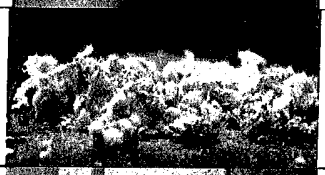
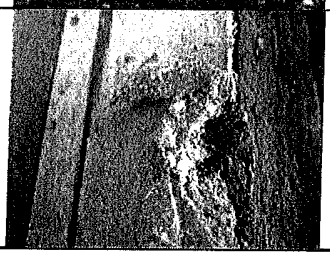
Principle of Operation

The inspection will allow the following to be assessed prior to acceptance:

1. Presence of untreatable and hazardous materials (e.g. tars, clinker, asbestos insulation etc.) in the contaminated soil.
2. Presence of excessive litter/debris in the contaminated soil.
3. Compliance with the previously supplied chemical/physical analysis information (supplied by waste producer).
4. Potential for the waste to behave as a liquid or have free water/oil in the waste

If the waste material is not compliant with the agreed conditions of the Environmental Permit and pre-acceptance assessment then the waste will be declined/rejected. As a note, the forms of untreatable asbestos described in point 1 are predominantly insulation products as follows in Table 1.

Table 1. Unacceptable Forms of Asbestos Insulation Products

Form of asbestos	Example
Asbestos pipe lagging	
Loose asbestos fill	
Asbestos insulation board (AIB)	

Procedure

Pre-Acceptance Assessment

This is undertaken by Provectus to confirm treatability to meet the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer including a clear statememt of any waste characterisation samples that are deemed untreatable. These are agreed in writing between the Waste Producer and Provectus prior to an authorisation number (contract line) being issued by FCC at the weighbridge for deposit at the Soil Treatment Facility.

Where data gaps exist or queries remain about the suitability of material for treatment, Provectus or FCC will offer to attend the site of origin to undertake pre-acceptance analysis and visually inspect the material and obtain further information about the waste description.

In the event that the moisture content of the waste being in the range of 25-30% then the potential for free water or oil will be further reviewed. Where moisture contents are at this level or even higher and the material does not behave as a liquid, have the potential for releasing water/oil etc and is suitable for the site infrastructure then it would be accepted on a case by case basis.

Should either Provectus, or after consultation, FCC determine that there is the high potential for material to contain untreatable inclusions or to behave as a liquid or contain free water or oil then the waste will be declined for acceptance.

Duty of Care Documentation

Duty of Care Documentation and other legal procedures (registration of hazardous waste site *etc.*) are completed between the Waste Producer and forwarded to FCC. No tipping on the STF will be permitted without relevant documentation from the waste producer. This must be checked on-site at the STF to ensure that the load is indeed destined for the STF, and that the documents are correctly completed. In the case of hazardous waste, the consignment note shall be filled in by a member of Provectus staff; and in the case of non-hazardous waste, the waste transfer note shall be inspected at the STF site office, and the load checked by a Provectus staff member at the STF.

Health and Safety

The site technician or PM is to provide guidance to the location for soil to be tipped, and any relevant safety information prior to tipping of soil.

Technicians and site personnel are to stand well away from the lorry when tipping so as to avoid any crush injuries/incidents as a result of being in close proximity to the tipping lorry. Any drivers must be informed of the requirement to wear a hard hat and high visibility vest when outside of the lorry cabin.

Lorries shall be informed to check that any waste/debris is removed from their lorry prior to leaving the STF.

Visual Inspection: Waste Input

The following locations will be used for accepting wastes:

- Hydrocarbons only: biopile treatment area
- Asbestos only, or asbestos and hydrocarbons: asbestos processing shed

The following plant and personnel are required as part of this procedure:

- Provectus STF Technician
- Excavator / loading shovel (if available)

Each load of soil for inspection will be tipped onto the nominated quarantine area by the tipper lorry. The technician will inform the tipper lorry driver to remain at the stockpiling area until the inspection has been completed.

In the event of the material containing free water or oil, the load will be immediately rejected.

In the event of untreatable forms of asbestos being present, the load will be immediately rejected

The excavator will be used to expose any unsuitable materials and allow a comprehensive visual assessment. The technician will determine the next action when this has been completed, this will comprise of the following:

- Waste is accepted and tipper lorry is permitted to leave the STF with the accompanying paperwork, or;
- Waste is not accepted and the unsuitable element of waste load, either partial or complete load is removed by excavator and placed back into the tipper lorry. A rejection form is filled in on-site and both Landfill Manager (LM) and Sales Manager (SM) are informed. It is the duty of FCC to inform the Environment Agency of any rejected loads.

At the end of the formal waste acceptance procedure the soil will be prepared for processing or biotreatment. Coordination of further treatment/processing events is to be decided by the Site Manager/Site Operator.

Chemical Analysis: Waste Input

Based on visual inspection, sampling frequency will be considered; this is in relation to the volume from each hazardous waste production site. Sampling will be undertaken on soils using composite sampling methods described in BS812.

The chemical analysis of soils generally takes 5-7 days to complete, therefrore limited storage times are required. Materials will be placed into treatment as soon as practicable from the receipt of chemical analysis and formal acceptance of the waste.

The range of contaminants for analysis will be based upon the original contaminating substances. A copy of the analysis shall be checked by the PM for verification against the original client data. In the event of non-conformity, the PM shall liaise with the LM and SM, and a decision on the next course of action will be taken.

For avoidance of doubt, the limits for asbestos from laboratory testing will be as follows:

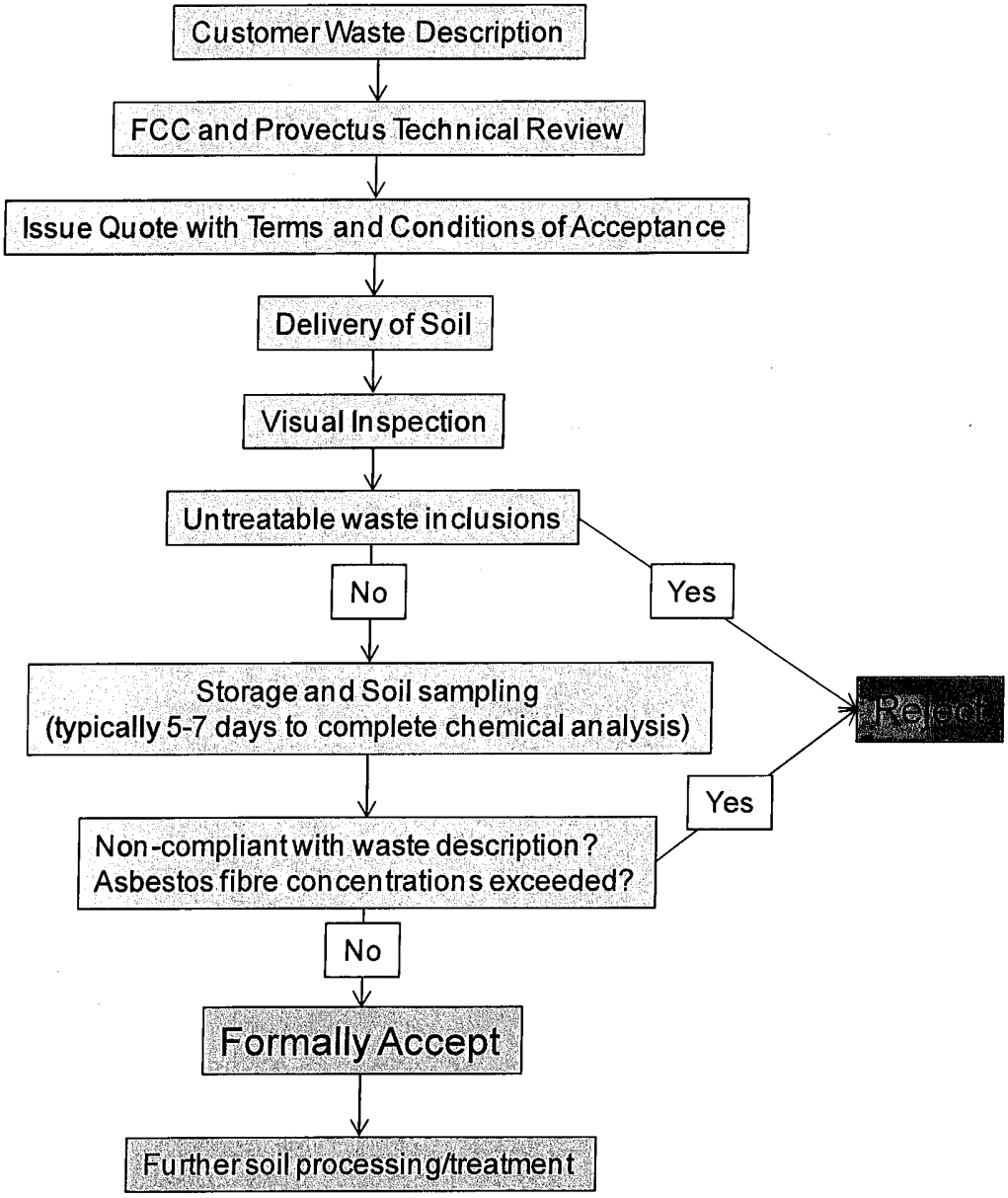
- Chrysotile only: 0.1%
- Other forms of asbestos (or chrysotile and others): 0.01%
- Asbestos debris limited to those which can be removed as Notifiable Non-Licensed Works (NNLW)

The waste will only be formally accepted once initial reception analyses is received in accordance with procedure STF PR02.

Summary of Waste Reception

Figure 1 is a flow diagram for the waste reception procedure. The procedure is implemented to ensure that the waste is only formally accepted once visual inspections and chemical analysis of received wastes has been successfully completed. This ensures that any soils that are formally accepted are suitable for further soil processing/treatment. All non-compliant wastes will be rejected.

Figure 1. Summary of Waste Acceptance Procedure



APPENDIX 4

The Airshed

Air Quality, Odour and Environmental Noise

Air Quality Impact Assessment
Proposed Soil Treatment Facility
at Daneshill Landfill
Lound Retford

Prepared by
The Airshed, 5 Lauder Place, East Linton
East Lothian EH40 3DB
Tel. 01620 860 529
mail@theairshed.com
www.theairshed.com
Registered in Scotland
Company No. SC309129

Record of changes

Version	Date	Change
1	18th December 2019	1st draft for internal review
2	8th January 2020	For client review
3	13th January 2020	Further and clarification of project description
4	2nd March 2020	Change to report title

Executive Summary

FCC Recycling (UK) propose to operate a new soil remediation facility on land at Daneshill Road, Lound, Retford DN22 8RB. The proposed facility is located in a rural area adjacent to a former landfill and current waste treatment facilities. The nearest established residential areas are Ranskill to the northwest, Torworth to the west and Lound to the east. There are isolated houses within 1km of the proposed facility, including the Travellers site at Daneshill Road.

The proposed bioremediation process will utilise industry standard bio-pile technology and will operate through the use of bio-piles and moisture control with extracted air treated in a bio-filter before being released to the atmosphere.

Caulmert Ltd, Environmental Consultants, has appointed The Airshed to conduct an air quality impact assessment (AQIA). The scope of this assessment is to consider the potential air quality impacts on human health from the emissions of VOCs. Dust impacts associated with the proposed facility are considered elsewhere.

The nearest sensitive receptors where long-term exposure is relevant is at the Travellers' site on Daneshill Road, ~280m to the south-east.

The airborne concentrations of pollutants have been predicted using ADMS 5.2, a widely used atmospheric dispersion model, using five years of hourly sequential meteorological data from RAF Scampton. The assessment considers the effects of these emissions on sensitive receptors in terms of Environmental Assessment Levels (EALs) for assessing human exposure. A single Scenario has been assessed:

- Scenario 1 considers emissions from the bio-filter assuming the maximum measured concentrations of VOCs reported at a similar site elsewhere.

The predicted concentrations of Benzene, Toluene, Ethylbenzene and Xylene are 0.0% of the relevant long-term and short-term EALs at the nearest sensitive receptors. The predicted air quality impacts from the proposed facility are insignificant.

Contents

TABLES

FIGURES

APPENDICES

Acronyms

AD	Anaerobic Digestion
ADMS 5	Air Dispersion Modelling System Version 5
AERMOD	Preferred dispersion model for USEPA
AOD	Above Ordnance Datum
AQIA	Air Quality Impact Assessment
AQMA	Air Quality Management Area
AQS	Air Quality Standards
As	Arsenic
BAT	Best Available Technique
C_6H_6	Benzene
$C_{20}H_{12}$	Benzo(a)pyrene
Cd	Cadmium
CERC	Cambridge Environmental Research Consultants
CLF	Critical Loads Function
CO	Carbon Monoxide
Co	Cobalt
CHP	Combined Heat and Power
Cr	Chromium
Cr_{VI}	hexavalent Chromium
Cu	Copper
°C	Degrees Centigrade
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency for England
EAL	Environmental Assessment Level
EIA	Environmental Impact Assessment (a process)
EQS	Environmental Quality Standard
ES	Environmental Statement (a document or series of documents)
FGT	Flue Gas Treatment
g/s	grams per second
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
Hg	Mercury
HHRAP	Human Health Risk Assessment Protocol
IED	Industrial Emissions Directive
IPPC	Integrated Pollution Prevention & Control Directive
K	degrees Kelvin
kW	kiloWatt
LNR	Local Nature Reserve
m/s	metres per second
m^3/s	cubic metres per second
mg/m^3	milligrams per cubic metre(10^{-3})
Mn	Manganese
MSW	Municipal Solid Waste
ng/m^3	nanograms per cubic metre (10^{-9})
NH_3	Ammonia
Ni	Nickel
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
O_2	Oxygen
OS	Ordnance Survey
Pb	Lead
pg/m^3	pico gram per cubic metre (10^{-12})
PM_{10}	Particles with aerodynamic diameter less than 10 microns
$PM_{2.5}$	Particles with aerodynamic diameter less than 2.5 microns
PC	Process Contribution
PEC	Predicted Environmental Concentration
Sb	Antimony
Sn	Tin
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TEQ	Toxic Equivalent (usually for dioxins and furans)
TG(16)	Technical Guidance Note for Local Air Quality revised in 2018
Tl	Thallium
tpa	tonnes per annum
ug/m^3	micrograms per cubic metre (10^{-6})
U_{10}	wind speed at measurement height – usually 10m above local ground level
USEPA	Environment Protection Agency (for the United States of America)
V	Vanadium
VOCs	Volatile Organic Compounds
WwTP	Wastewater Treatment Plant
WID	Waste Incineration Directive
Zn	Zinc

Prediction is very difficult, especially about the future.
Niels Bohr, Danish physicist (1885 - 1962)

1.0 INTRODUCTION

Background to Report

1.1. FCC Recycling (UK) Ltd who are a wholly owned subsidiary of FCC Environment (UK) Ltd, propose to operate a new soil remediation facility on land at Daneshill Road, Lound, Retford DN22 8RB. The proposed facility is located in a rural area adjacent to a landfill and other waste treatment facilities. The proposed facility is located in a rural area where the nearest established residential areas are Ranskill to the northwest, Torworth to the west and Lound to the east. There are isolated houses within 1km of the proposed facility including the travellers site at Daneshill Road. The site location is shown in Figure 1.

1.2. The proposed bioremediation process will utilise industry standard bio-pile technology and will operate through the use of bio-piles and moisture control; addition of suitable nutrients to the soil and forced air extraction to encourage micro-organism growth leading to the breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. Soils will typically be treated over an 8-16-week period, with the material being turned infrequently, typically once every 8 weeks. The bio-piles will be placed on water and air extraction pipes connected to a blower that will draw air through the soils. The extracted air is then passed through a bio-filter before being discharged to the atmosphere. Excess water draining through the soils will be collected and treated to remove any oils or suspended solids. Further details on the project description are presented in Appendix 1.

1.3. Caulmert Ltd, Environmental Consultants, has appointed The Airshed to conduct an air quality impact assessment (AQIA). The scope of this assessment is to consider the potential air quality impacts on human health from the emissions of VOCs. Dust impacts associated with the proposed facility are considered elsewhere.

Table 1.1 – Sensitive Receptors – Human Health (selected <2km)

No.	Location	OS x	OS y	Distance (m)
1	Travellers Site	467595	386491	279
2	Daneshill Cottage	467047	386590	474
3	House to east	468272	386638	788
4	Mattersey Road	468558	386067	1265
5	Lound	468895	386146	1528
6	Lound	469046	386531	1568
7	North View	469083	387159	1641
10	Mattersey Hill	468172	388578	1949
11	Lakeland House	467346	388611	1865
12	Mattersey Road	466777	388399	1797
14	Maltkiln Cottage	466239	387768	1614
15	Willow Avenue	466196	387589	1544
16	Lakeside Fishery	466351	387458	1344
17	Underwood Avenue	465818	387047	1701
18	Moat Farm	465851	386645	1645
19	Torworth Grange	465970	386001	1698
20	College Farm	466102	385473	1889

(N.B. distances are from the centre of the bio-filter)

1.4. The locations of the sensitive receptors considered in the study are shown in Figure 1 and receptor locations are presented in Table 1.1 above. The nearest receptor location is the Travellers' site 279m to the southeast of the proposed bio-filter.

Scope of Air Quality Impact Assessment

1.5. This assessment considers the potential adverse air quality impacts from the proposed facility on human receptors. The main pollutants of concern are Benzene, Toluene, Ethylbenzene and Xylene. This assessment is based on the assumption that the contaminants in the soils to be used at the facility will be similar in character to those tested at the Edwin Richards Quarry.

1.6. This study is intended to help determine the likely effects of the emissions on adjacent receptors. The dispersion model used in this study, ADMS 5.2, has been widely validated. Experience has shown that the model is conservative, so that it will tend to over-predict, provided the source estimates are accurate.

1.7. The assessment considers the effects of the emissions from the facility in terms of environmental assessment levels (EALs).

Report Structure

1.8. Section 2 discusses relevant air quality standards, and English and European Regulations and Guidance relating to air quality assessment criteria.

1.9. Section 3 describes the pollutant emission rates for the WwTP. The section also discusses the baseline air quality conditions around the installation, taking account of the character of the emissions.

1.10. Section 4 sets out the reasons for the approach to assessment and details the assumptions made in the dispersion model.

1.11. The results from the dispersion modelling are presented in Section 5.

1.12. Proposed mitigation measures are outlined in Section 6.

1.13. The significance of the residual emissions is presented in Section 7.

2.0 RELEVANT LEGISLATION AND STANDARDS

Introduction to Section 2

2.1. This section discusses relevant Guidance relating to the installation.

Environmental Assessment Levels

2.2. The Environment Agency (EA) has published Guidance[1] that proposes a simple screening approach where the predicted process contribution (PC) long-term concentrations of pollution may be regarded as insignificant where the PC <1% of the EAL. PC <10% of the EAL is insignificant for short-term concentrations. The relevant EALs for this assessment are set out in Table 2.1 below. Odour impacts are considered separately.

Table 2.1 – Environmental Assessment Levels (Human Exposure)

Pollutant	Long term	Short term
	ug/m^3	ug/m^3
Benzene	5	-
Toluene	1,910	8,000
Ethylbenzene	4,410	55,200
Xylene	4,410	66,200

N.B. columns are blank where there is no relevant EAL.

EA Guidance for Odour

2.3. The EA has issued Guidance on odour assessment[2] for processes that are subject to the Environmental Permitting Regulations (H4). The EA's odour criteria are based on the 98%ile of hourly averages in a typical year. This allows for atypical odour emissions or poor dispersion caused by unfavourable weather conditions around 175 hours over a year. According to this Guidance, odour from the most offensive odours, which is likely to include leachates, should be less than 1.5 OU_E/m^3 1 hour 98%ile at sensitive receptors. These criteria are quantified using dynamic olfactometry in accordance with British Standard, BS 13725:2003.

2.4. H4 advises that odours from different processes within the same installation are not necessarily equally offensive and that this should be taken into account. This assessment assumes that an odour benchmark of 1.5 OU_E/m^3 1 hour 98%ile will apply.

BS EN 13725 : 2003

2.5. The use of odour units, based on human response to odour rather than chemical speciation, presumes that human response to odour can be quantified scientifically. The European Standard for measurement of odour concentration, BS EN 13725 : 2003[3] specifies the sampling and analytical procedures for dynamic olfactometry and the quality assurance requirements for repeatability of results. Based on this type of sampling method, the limit of detection for 50% of the test panel is 1 OU_E/m^3. Odour units are not a measurement of concentration, but rather a ratio of

[1] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions
[2] Environment Agency March 2011. H4 Odour Management. How to comply with your permit.
[3] BS EN 13725 : 2003. Air quality. Determination of odour concentration by dynamic olfactometry.

the number of dilutions required to reduce an odour to where it cannot be detected by 50% of the odour test panel.

Where Should EALs and Odour Benchmarks Apply?

2.6. Air quality standards should apply to all locations where members of the public may be reasonably likely to be exposed to air pollution for the duration of the relevant objective. Thus short-term standards intended to prevent exposure to toxic air pollutants with acute effects should apply to footpaths at site boundaries and other areas which may be frequented by the public even for a short period of time.

2.7. Longer term exposure and odour benchmarks should only apply at houses and gardens or other locations which the public can be expected to occupy on a continuous basis.

2.8. The receptors used in the modelling assessment are shown in Figure 1. The predicted impacts at these receptor locations are concerned with air quality impacts on human health and amenity.

2.9. This assessment assumes that odour benchmarks around the proposed installation should only apply to residential areas, or other locations which members of the public are likely to occupy over an extended period of time; and that pedestrians on footpaths and people on roads adjacent to the site are not sensitive to odour. All dwellings are considered to be highly sensitive receptors as defined by the IAQM 2014 Odour Guidance[4].

Assessment Framework

2.6. The assessment framework used to assess the significance of air quality impacts is set out in Table 2.2 below. This is based on DEFRA/EA Guidance[5] and the EA's informal pragmatic risk assessment method. These assessment criteria only apply to EALs and do not apply to the assessment of odour.

Table 2.2 - Air Quality Impact Assessment Criteria (Annual Mean at Receptors)

Predicted Impact	Adverse Significance	Justification
Greater than air quality limit value or objective	Major	Exceeding any air quality limit value would be unacceptable in terms of human health, or where the impact would have significant adverse ecological impacts.
Process Contribution >30% of EAL	Moderate	Risk based approach advocated by Environment Agency taking account of model headroom and uncertainty.
Process Contribution <30% of EAL	Minor/Moderate	Risk based approach advocated by Environment Agency taking account of model headroom and uncertainty.
Process Contribution <10% of EAL	Minor	Based on rule of thumb (factor of 10)
Process Contribution <1% of EAL	Insignificant	This is the assessment criteria proposed by EA as a screening method which states that process contributions can be considered insignificant if the long-term process contribution is <1% of the long-term environmental standard.

[4] IAQM 2014. Guidance on the assessment of odour for planning.
[5] Air emissions risk assessment for your environmental permit https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions

3.0 BASELINE AIR QUALITY AND PROCESS EMISSION INVENTORY

Emission Inventory for the AQIA

3.1 The emission estimates for the soil treatment facility assumes that all emissions are released from the surface of the bio-filter and ignores any fugitive emissions from the stockpiles and screening and grading operations.

3.2 Details of the emission rate from the bio-filter are presented in Table 3.1 at the end of the text.

3.3 A single emission Scenario has been considered for the assessment:

- Scenario 1 is based on the maximum measured concentration from a similar installation elsewhere.

Baseline Air Quality

3.4 The only available baseline estimates for Benzene in the study area are from DEFRA modelled projections based on work conducted in 2001. This indicates that the annual mean exposure to Benzene in air within the study area was up to 0.275ug/m^3 for the year 2010.

4.0 DISPERSION MODELLING

Introduction to Section 4

4.1. This Section sets out the reasons for the approach to assessment and details the assumptions made in the dispersion modelling.

Justification for Approach

4.2. The likely impact from process emissions may be estimated using an appropriate atmospheric dispersion model and reliable emission estimates. The emissions from the process for Scenario 1 are based on worst-case emission concentrations measured at a similar facility elsewhere.

4.3. The objective of the dispersion modelling assessment is to predict the likely effect of the prevailing climate, local surface conditions and topography on plume behaviour; and to predict the likely worst case airborne concentrations at sensitive receptors around the facility.

4.4. The pattern of pollutant dispersion may be estimated using several years of historical meteorological data from a representative site. Air quality impacts are assessed against Environmental Assessment Levels.

4.5. The assessment ignores the impacts from fugitive emissions. This is contingent on appropriate measures being adopted at the site to prevent or minimise fugitive releases.

Approach to Modelling Uncertainty

4.6. Environment Agency policy statement[6] refers to the Royal Meteorological Society Guidelines on Dispersion Modelling. According to this Guidance, dispersion modelling studies should include a Sensitivity Analysis for model inputs to provide an estimate of the possible errors in the predictions. The Environment Agency has also published requirements for dispersion modelling.[7] This includes advice on the Agency's requirements for reporting. These Guidance documents have been taken into account in the assessment.

4.7. A widely recognised mathematical model (ADMS 5.2) has been used to predict how emissions will be dispersed taking account of: the source conditions (using emission factors and the flow rate and pollutant concentrations); release conditions (efflux velocity and temperature); meteorological conditions from a representative site (in this case near ground measurements at RAF Scmpton supplied by the Met Office); building effects and surface conditions (surface roughness).

4.8. ADMS 5.2 has been developed specifically for industrial point sources.[8] The model is widely used in the UK for environmental assessment and is

[6]Environment Agency, undated. Policy Statement EAS/2007/1/1
[7]Environment Agency, undated. Air Dispersion Modelling Report Requirements (for detailed dispersion modelling).
[8]CERC 2016. ADMS-5, The Multiple Source Air Dispersion Model. CERC, Cambridge.

generally considered by UK environmental agencies to be suitable for air quality impact assessment subject to its proper use.

4.9. Potential difficulties and limitations in this type of study when applied to air quality impact assessments include:

- Lack of good information about the risk to human health from process emissions. This assessment relies on the Environmental Assessment Levels (EALs) published by the Environment Agency;
- Uncertainties in baseline conditions. The baseline estimates used take account of available background estimates published by DEFRA;
- Errors in source terms used to estimate emissions. Emission rates are based on worst-case measured pollutant concentrations at a similar site elsewhere and air flow estimates provided by the operator;
- Errors inherent in the dispersion model used. The model is considered to be suitable for use in this application and has been validated for area sources; and
- Errors introduced by the model user due to the use of inappropriate or unrepresentative input values such as meteorological data or surface roughness values. A Sensitivity Analysis has been conducted to take these potential errors into account. The significance of these factors is discussed in Section 5. In general the approach used in this assessment has been to include worst case factors where these may otherwise lead to underestimates of worst case conditions.

4.10 This assessment presents a detailed account of the modelling process and considers the model sensitivity to the main user inputs. An inventory of the models run for this project is presented in Table 4.1 at the end of the text.

Dispersion Modelling

4.11 The transport and transformation of a pollutant in the boundary layer,[9] can be predicted with a reasonable degree of confidence using an appropriate mathematical model. The model used for this exercise is ADMS 5.2. This mathematical model enables the calculation of multiple sources and includes an algorithm for assessing flow around buildings that may cause entrainment. The principal factors affecting the concentration of a pollutant are:

- Source characteristics including source strength, height of discharge, density, and temperature of the release;
- Prevailing atmospheric conditions including wind speed, wind direction, cloud cover, precipitation, ambient temperature and the depth of the boundary layer; and

[9]The boundary layer is the layer of the atmosphere near the surface of the Earth that is affected by mechanical turbulence from surface friction and convective turbulence through local surface heating.

- Adjacent topography and local surface conditions.

These factors can be assigned numerical values and the resultant downwind concentrations of pollutants may be predicted.

4.12 The model description is published in the user guide for ADMS 5.2. The model was originally developed as a research project jointly funded by HSE, the Met Office and Her Majesty's Industrial Inspectorate of Pollution. The model is routinely used by UK environment agencies.[10]

Model Parameters

4.13 The temperature and efflux velocity of the stack gases are based on engineering estimates provided by the supplier. The emissions from the process are summarised in Table 4.2 in accordance with the requirements of H1[11] and Environment Agency Guidelines.

Source Condition, Location and Height

4.14 The emissions have been considered as continuous, steady state area source near ground level. The location of the proposed bio-filter is shown in Figure 2. The bio-filter release is assumed to be 1m above local ground level. The flow from the bio-filter has been modelled as a zero volume, zero velocity release.

4.15 The details of the proposed facility were obtained from the site planning drawings and the OS map base at 1:1250 and 1:10,000 scales.

Surface Roughness

4.16 The surface roughness conditions at the site have been assumed to have a surface roughness value of 0.5m as this is considered to represent worst case conditions for dispersion. This value has been used across the domain.

Meteorological Data

4.17 The selection of suitable meteorological data needs to be conducted with care. The main limiting factor for suitable meteorological data is continuous observations of cloud cover, used in the model to determine atmospheric stability.

4.18 Five years of hourly sequential meteorological data from RAF Scampton (2012 - 2016 inclusive) have been used to predict the dispersion around the site. Monks Wood is 34km to the south of the proposed installation and is likely to be reasonably representative of conditions at the study area. The worst case one year in five has been used in the assessment. A summary of the meteorological data is presented in Appendix 2. A model sensitivity analysis has also been conducted using 5 years of hourly sequential meteorological data for Wittering (2014 - 2018), which is

[10] Details of model validation studies are available at http://www.cerc.co.uk/software/publications.htm
[11] Environment Agency December 2011. H1 Risk Assessment Annex F v2.2

~29km to the south-east. Theses data has been used to assess worst case impacts for long-term exposure.

Building Effects

4.19 The release at near ground level so that building effects on dispersion have been discounted.

Terrain Effects

4.20 The land near the proposed installation is relatively level across the site, with only minor variations in ground level across the study area. The local topography is plotted in Figure 3. Terrain effects are unlikely to affect air flow and dispersion. Terrain effects have therefore been taken into account as a precaution.

Time Averaging and Percentiles

4.21 The averaging time for all pollutants is based on a 1 hour average. The 1 hour 100%ile has been calculated for pollutants where appropriate. Odour has been predicted using the 1 hour 98%ile and 100%ile.

Grid Resolution and Receptors

4.22 Predictions have been made at 20 fixed point receptor locations around the site to represent exposure at existing receptors and to assist with the model Sensitivity Analysis. These receptor locations are shown in Figure 1. The predictions have been modelled at a height of 1.5m above ground level.

4.23 Predictions have also been provided over the study area on a grid 43 by 36 at intervals of 100m where x1 = 465000; y1 = 385200; x2 – 469800; and y2 = 388700.

Removal Effects

4.24 Atmospheric chemistry and photo-lytic reactions have been ignored in the dispersion modelling.

Overview of the Modelling Process

4.25 Details of the ADMS dispersion model runs are presented in Table 4.1 at the end of the text.

5.0 IMPACT ASSESSMENT RESULTS

Model Sensitivity Analysis

5.1. It is a requirement of the Royal Meteorological Society Guidelines on Dispersion Modelling[12&13] that studies should include a Sensitivity Analysis for model inputs, to provide an estimate of the possible errors in the predictions. The potential errors in predictions and limits to the dispersion model were outlined in Section 4. The Sensitivity Analysis conducted for this study is based on the findings of the model sensitivity analysis. The results for the model sensitivity analysis are presented in Appendix 3. The model predictions are based on the worst case one year in five, and allow for topography effects and worst case surface roughness conditions.

Results – Human Health

5.2. The predicted contours for airborne Benzene for Scenario 1, excluding background, are plotted in Figure 4. This indicates that the predicted annual mean concentration of Benzene is below the significance threshold of 1% of the EAL for human exposure. The predicted concentrations for all pollutants at sensitive receptors are included within Appendix 3 and summarised in Table 5.1 below.

Table 5.1 - Worst Case Predicted Levels at Sensitive Receptors (Scenario 1)

Pollutant	Long-term	Short-term
	ug/m^3	ug/m^3
Benzene	0.00031	0.0534
Toluene	0.00495	0.8545
Ethylbenzene	0.00046	0.0790
Xylene	0.00124	0.2136

5.3. These predictions are based on worst case dispersion conditions for meteorology and surface roughness. The criteria used to assess the significance of pollutants were presented in Table 2.2. The significance of these predicted concentrations may be determined from Table 5.2 below, where the predicted process contribution is expressed as a percentage of the Environmental Assessment Level. Impacts are insignificant where the process contribution is <1% of the long-term EAL.

Table 5.2 – Significance of Worst Case Predicted Levels at Sensitive Receptors

Pollutant	Long term	Short term
	ug/m^3	ug/m^3
Benzene	0%	-
Toluene	0%	0%
Ethylbenzene	0%	0%
Xylene	0%	0%

N.B. columns are blank where there is no relevant EAL. (Scenario 1)

[12]Royal Meteorological Society May 1995. Policy Statement Atmospheric Dispersion Modelling. Guidelines on the justification of choice and use of models and the communication and reporting of results

[13]ADMLC 2004. Guidelines for the Preparation of Dispersion Modelling Assessments for Compliance with Regulatory Requirements – an Update to the 1995 Royal Meteorological Society Guidance

5.4. This indicates that the process contributions are predicted to be well below the relevant EALs.

Model Headroom

5.5. The Environment Agency's method for assessing model uncertainty[14] indicates that confidence in the model is high for both short and long-term exposure based on Benzene (assuming Scenario 1 emissions).

Results - Odour

5.15. The predicted odour at the nearest sensitive receptors are well below the odour detection threshold for all pollutants.

[14] Ji Ping Shi and Betty Ng; 2004. Risk based pragmatic approach to address model uncertainty. Air Quality Modelling and Assessment Unit The Environment Agency 29 Newport Road Cardiff CF24 0TP. Paper Given At NSCA Seminar.

6.0 PROPOSED MITIGATION MEASURES

Operational Impacts

6.1 The following measures are proposed to prevent or minimise impacts on air pollution:

- The waste acceptance criteria for the proposed facility shall ensure that only suitable materials are deposited within the aerated static piles.
- The air stream into the bio-filter shall be cleaned to prevent dust loading into the filter media.
- The condition of the bio-filter bed shall be tested on a monthly basis to ensure satisfactory performance.
- Supervisory staff shall be trained to ensure that the facility is operated within specification.
- All process operations shall be subject to routine planned preventative maintenance.
- Environmental monitoring shall be conducted to confirm the pollutant concentrations are within the assumed levels and to ensure compliance with Environmental Assessment Levels.

7.0 EVALUATION OF IMPACTS

Human Exposure

7.1 The assessment takes account of the worst case model predictions, the relevant Environmental Assessment Levels (EAL) and the significance criteria set out in Tables 2.1 – 2.2.

7.2 The predicted impacts from the proposed facility are insignificant at all sensitive receptors in terms of the assessment framework set out in Table 2.2, where all pollutants are <1% of the EAL.

7.3 Odour impacts from the proposed facility are predicted to be negligible.

Tables

Item	Description	dimensions [1] m^2	volume of air [2] $m3/s$	pollutant [3]	maximum reported concentration [4] ug/m^3	maximum emission rate [5] g/s	maximum emission rate [5] $g/m^2/s$
1	bio-filter surface	475	2.778	Benzene	10	2.778E-05	5.848E-08
				Toluene	160	4.444E-04	9.357E-07
				Ethlbenzene	14.8	4.111E-05	8.655E-08
				m/p-Xylene	30	8.333E-05	1.754E-07
				o-Xylene	10	2.778E-05	5.848E-08

Notes

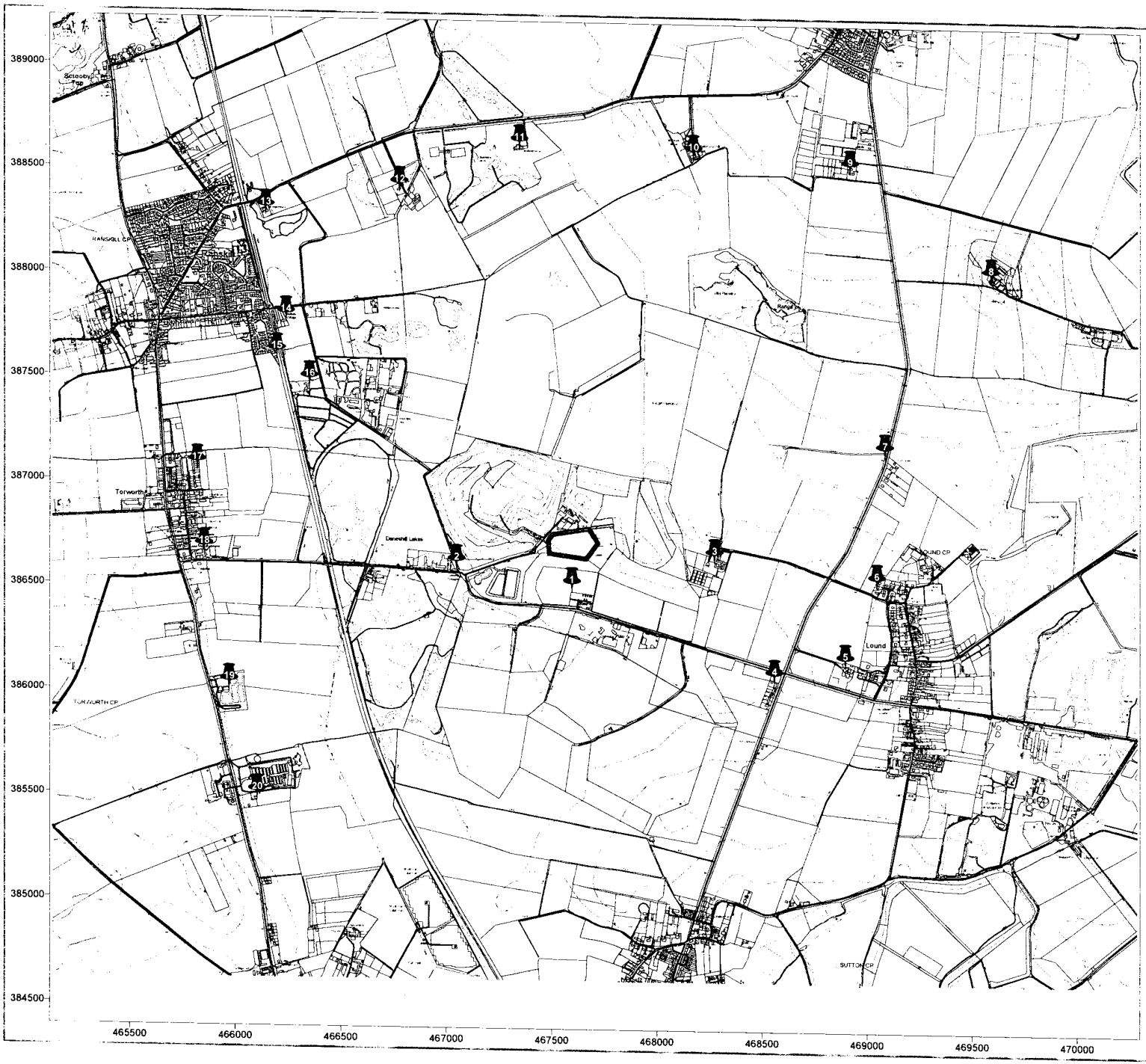
1. from drawing Daneshill No. 1. Provectus FCC Environment Provisional Layout September 2019
2. Email from Jon Owens Provectus to Andy Stocks Caulmert 28th November 2019
3. The species considered in this assessment are based on the available data from measurements at a similar facility elsewhere
4. Based on the maximum reported pollutant concentration at a similar site elsewhere.
5. No correction has been applied for STP or moisture

Results from sampling at bio-filter outlet Provectus Remediation Ltd Edwin Richards Quarry April 2018 - October 2019

BTEX	09-Apr-18	12-Mar-18	01-May-18	16-May-18	05-Jul-18	27-Jul-18	03-Sep-18	15-Oct-18	14-Nov-18	14-Nov-18	28-Dec-18	31-Jan-19	27-Feb-19	29-Mar-19	29-Apr-19	10-May-19	10-May-19	10-May-19	10-May-19	28-Jun-19	28-Jun-19	30-Jul-19	30-Aug-19	02-Oct-19	Max	average
Benzene	2.3	1.7	1.7	1.7	1.7	7.9	7.5	3.8	2.3	1.7	10	2	2	2	3	2	2	2	5	2	8	2	2	2	10	3
Toluene	5.3	2	1.7	2	1.7	11.1	9.2	4.9	2	1.7	10	10	20	10	20	3	20	20	30	20	40	30	160	53	160	20
Ethlbenzene	1.7	14.8	1.7	1.7	1.7	3.4	1.8	1.8	1.7	1.7	2	2	6	2	5	2	5	3	5	6	10	6	2	2	14.8	4
m/p-Xylene	1.9	10.9	1.7	1.7	1.7	15.1	8.4	6.7	1.7	1.7	3	6	20	7	10	3	10	6	9	20	30	20	4	4	30	8
o-Xylene	1.7	4	1.7	1.7	1.7	6.5	4.3	2.8	1.7	1.7	2	2	5	3	4	2	4	3	4	7	10	10	2	2	10	4

Model Inventory

Run	Name		Met Data	Surface roughness at site (m)	terrain	objective
1	Scampton 2014	.apl	Scampton 2014	0.3	off	to predict deposition for range of met. conditions
2	Scampton 2015	.apl	Scampton 2015	0.3	off	
3	Scampton 2016	.apl	Scampton 2016	0.3	off	
4	Scampton 2017	.apl	Scampton 2017	0.3	off	
5	Scampton 2018	.apl	Scampton 2018	0.3	off	
6	rough 0.3m	.apl	Scampton 2016	0.3	off	to assess significance of surface roughness on dispersion
7	rough 0.5m	.apl	Scampton 2016	0.5	off	
8	rough 1.0m	.apl	Scampton 2016	1.0	off	
9	terrain	.apl	Scampton 2016	0.3	on	to assess significance of terrain on dispersion
9	Scenario 1	.apl	Scampton 2016	0.3	off	to provide predictions for worst case dispersion conditions



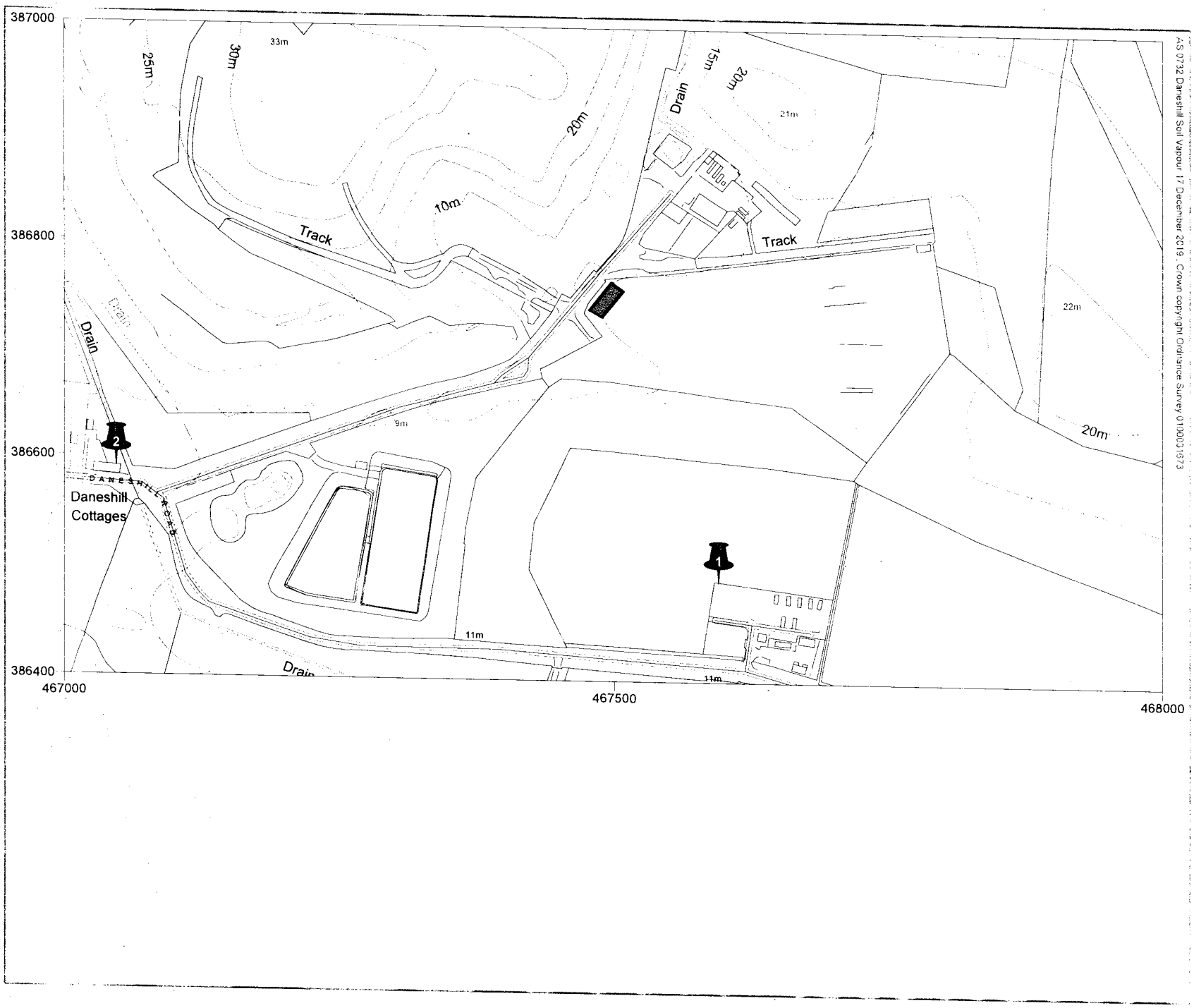
Site Location

indicative site location

sensitive receptor considered in study

Figure 1

Airshed



Model Layout

bio-filter

sensitive receptor considered in study

Figure 2

Airshed

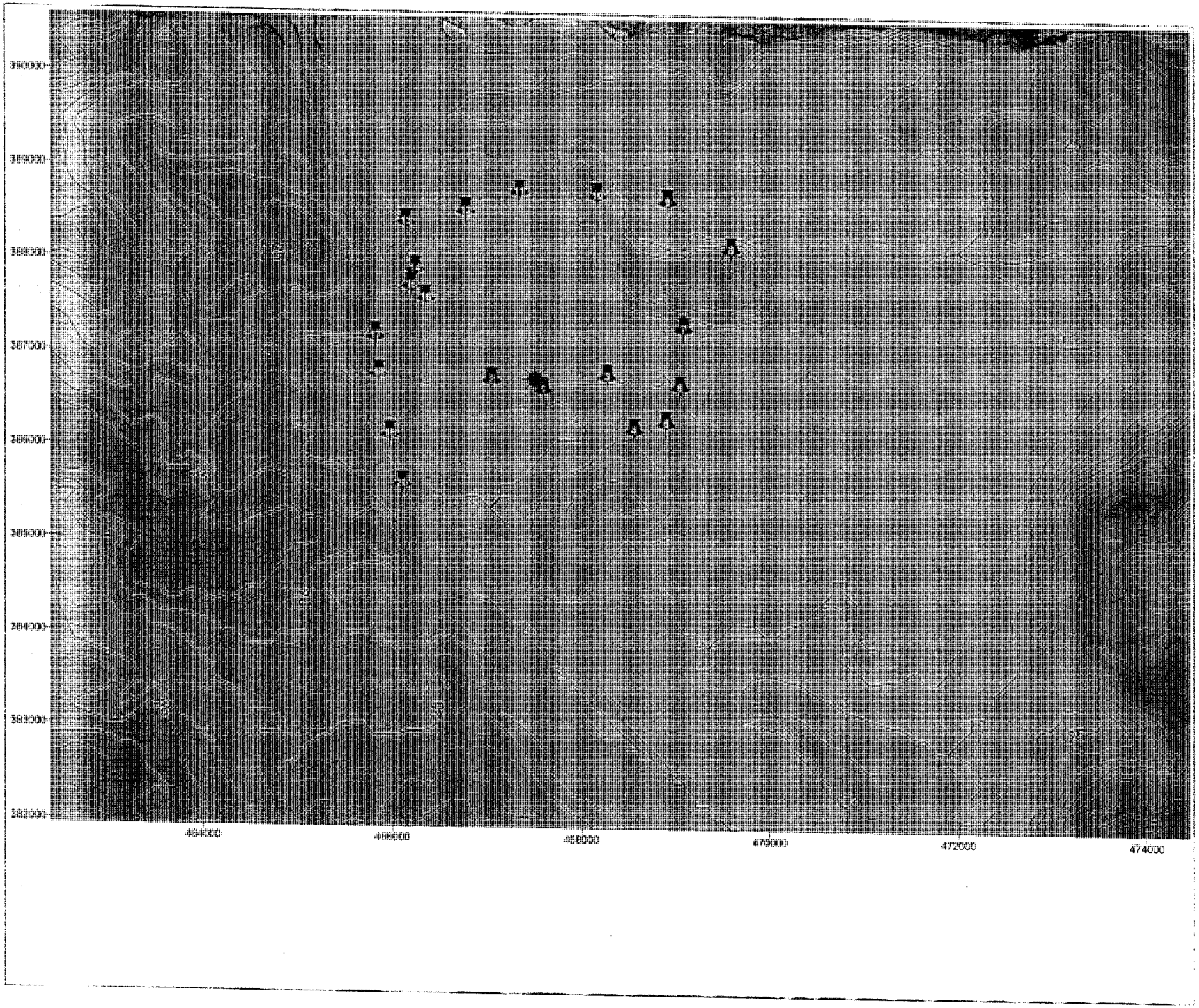
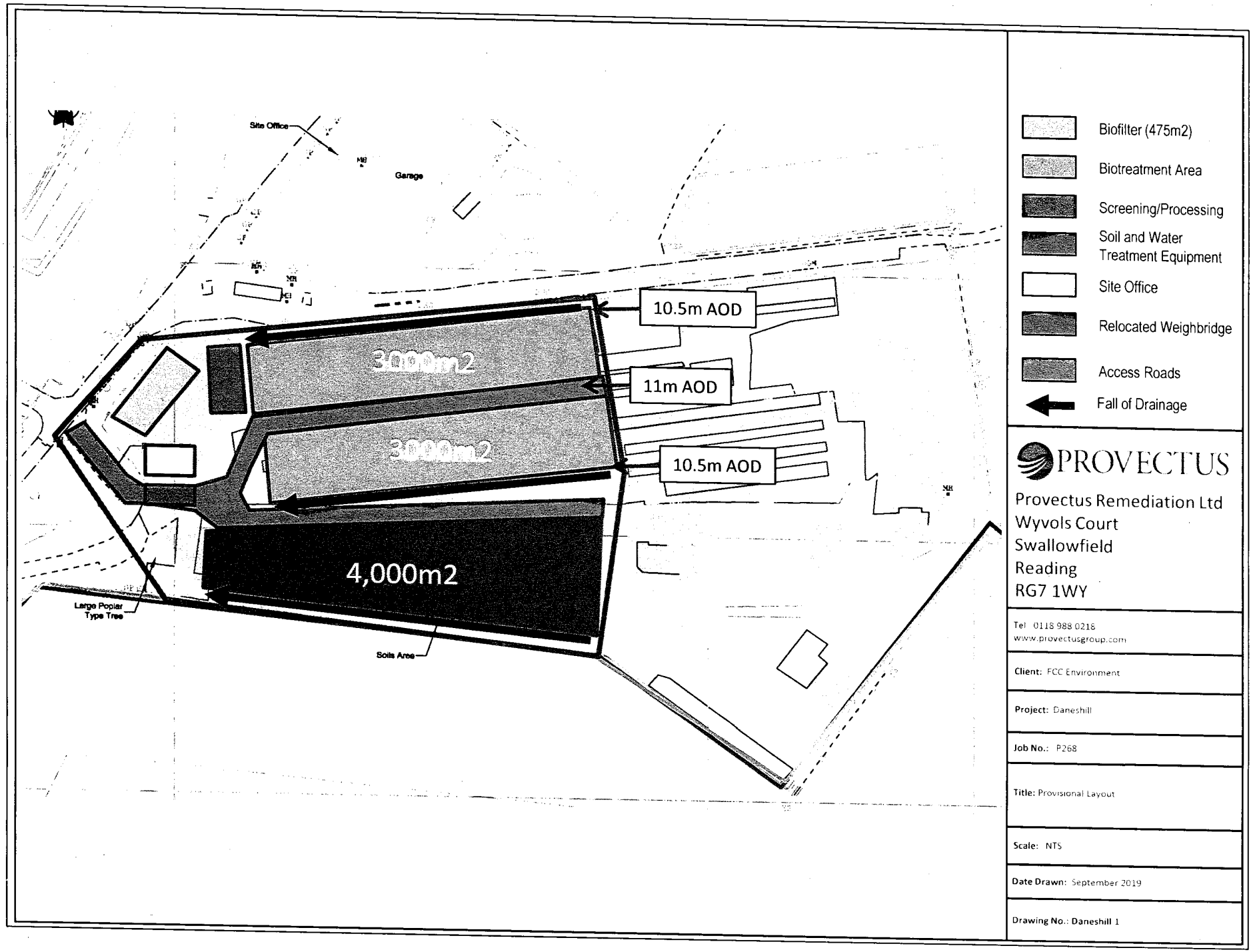


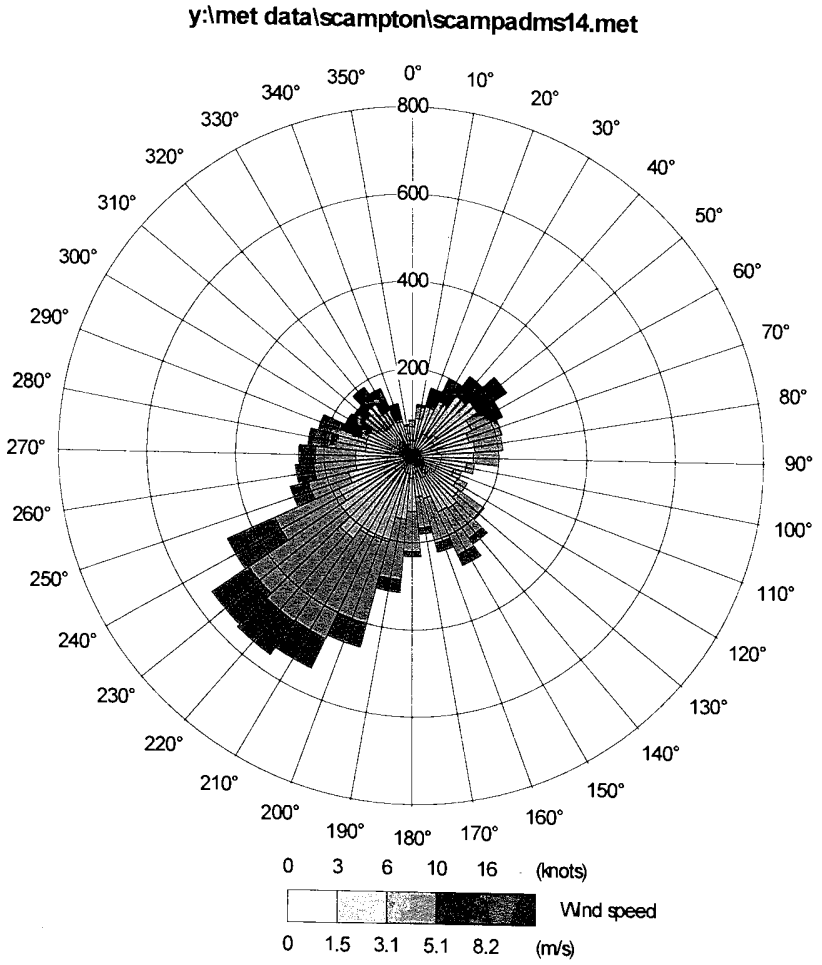
Figure 3

Airshed

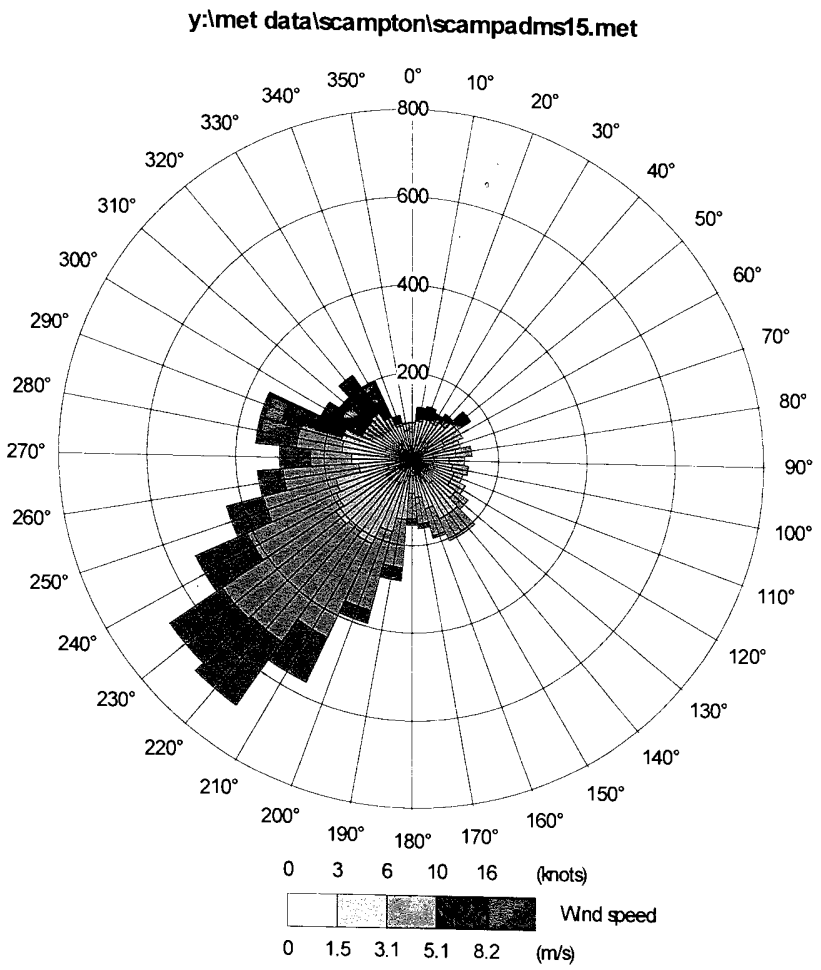
Appendix 1 – Project Description


Site Office
Garage
10.5m AOD
3,000m2
11m AOD
3,000m2
10.5m AOD
4,000m2
Large Poplar Type Tree
Soils Area
Biofilter (475m2)
Biotreatment Area
Screening/Processing
Soil and Water Treatment Equipment
Site Office
Relocated Weighbridge
Access Roads
Fall of Drainage
PROVECTUS
Provectus Remediation Ltd
Wyvols Court
Swallowfield
Reading
RG7 1WY
Tel 0118 988 0218
www.provectusgroup.com
Client: FCC Environment
Project: Daneshill
Job No.: P268
Title: Provisional Layout
Scale: NTS
Date Drawn: September 2019
Drawing No.: Daneshill 1

Appendix 2 – Model Inputs



Appendix 2



Appendix 2

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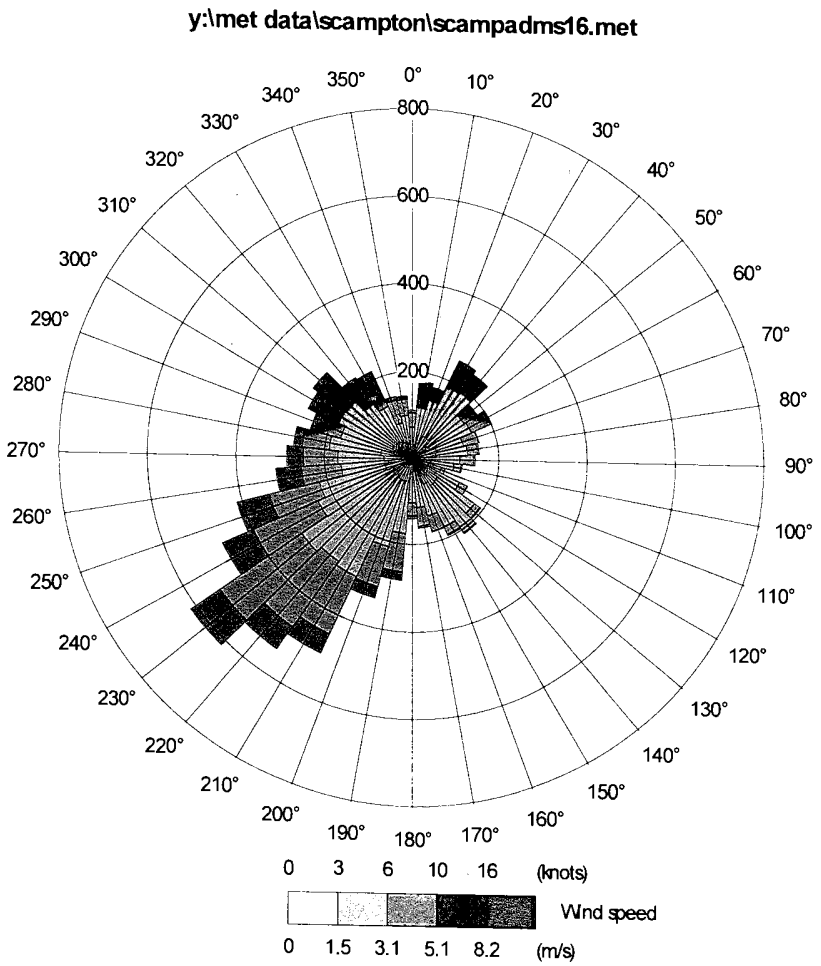
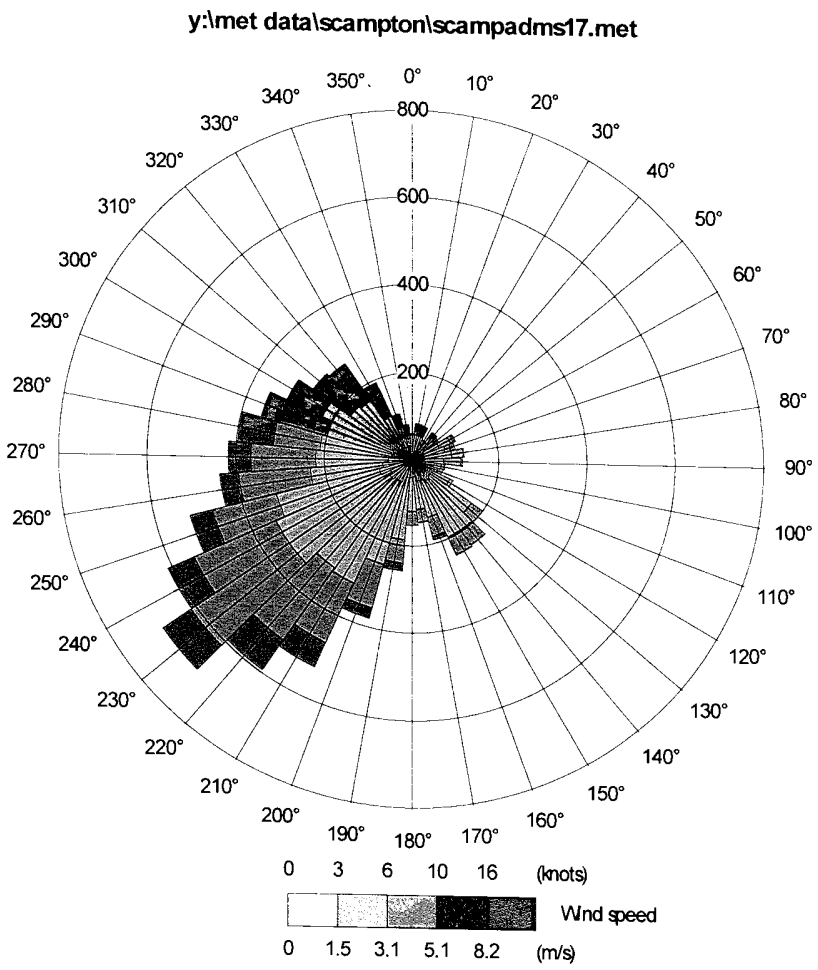


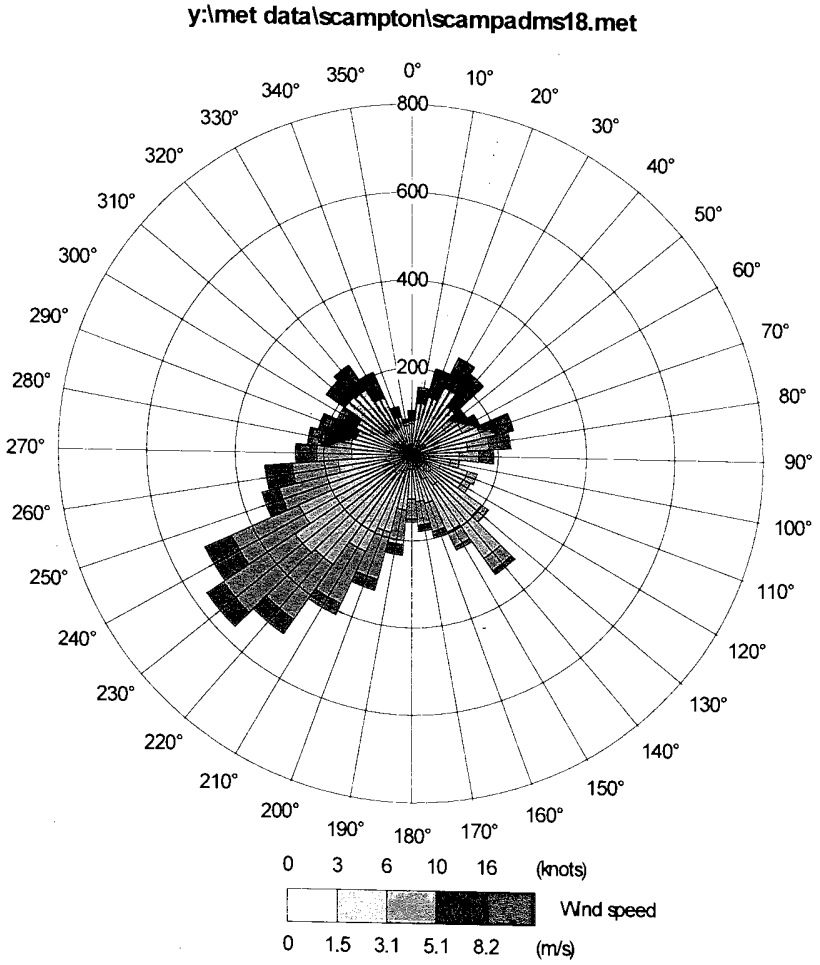
Appendix 2

Airshed



Appendix 2

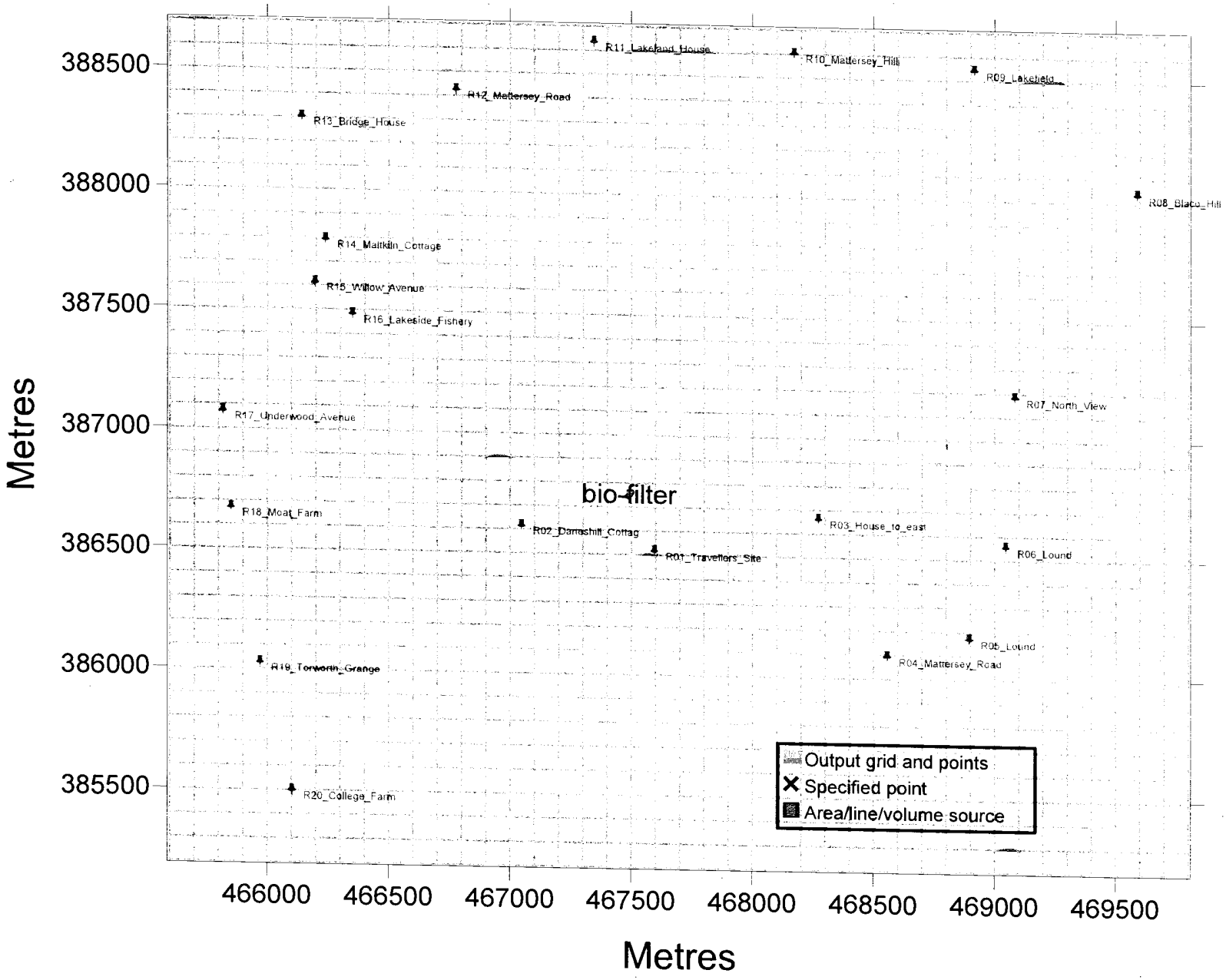
Airshed



Appendix 2

Airshed

Visualisation of ADMS input
P:\files\AS 0732 Daneshill Soil Vapour\model runs\Scenario 1.APL



Appendix 3 – Model Outputs

No	Receptor name	X(m)	Y(m)	LTConc | ug/m3 | BENZENE | <All sources> | - | 1hr	P100.00 | ug/m3 | BENZENE | <All sources> | - | 1hr	P 98.00 | ug/m3 | BENZENE | <All sources> | - | 1hr
1	Travellers Site	467595	386491	0.00018	0.02964	0.00188
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00168
3	House to east	468272	386638	0.00005	0.00556	0.00056
4	Mattersey Road	468558	386067	0.00002	0.00256	0.00023
5	Lound	468895	386146	0.00001	0.00193	0.00016
6	Lound	469046	386531	0.00001	0.00180	0.00017
7	North View	469083	387159	0.00002	0.00172	0.00020
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00013
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00017
11	Lakeland House	467346	388611	0.00001	0.00140	0.00014
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00015
14	Maltkiln Cottage	466239	387768	0.00002	0.00170	0.00023
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00024
16	Lakeside Fishery	466351	387458	0.00002	0.00240	0.00031
17	Underwood Avenue	465818	387047	0.00002	0.00161	0.00024
18	Moat Farm	465851	386645	0.00002	0.00171	0.00024
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00018
20	College Farm	466102	385473	0.00001	0.00136	0.00017
Max				0.00018	0.02964	0.00188

model sensitivity analysis
met data variability
Scampton 2014
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00020	0.03068	0.00202
2	Daneshill Cottage	467047	386590	0.00010	0.01306	0.00090
3	House to east	468272	386638	0.00007	0.00575	0.00078
4	Mattersey Road	468558	386067	0.00002	0.00264	0.00025
5	Lound	468895	386146	0.00002	0.00193	0.00021
6	Lound	469046	386531	0.00002	0.00186	0.00024
7	North View	469083	387159	0.00002	0.00172	0.00020
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00013
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00018
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00013
13	Bridge House	466143	388277	0.00001	0.00121	0.00014
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00021
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00022
16	Lakeside Fishery	466351	387458	0.00002	0.00240	0.00029
17	Underwood Avenue	465818	387047	0.00002	0.00161	0.00015
18	Moat Farm	465851	386645	0.00001	0.00171	0.00012
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00010
20	College Farm	466102	385473	0.00001	0.00136	0.00010
Max				0.00020	0.03068	0.00202

model sensitivity analysis
met data variability
Scampton 2015
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00025	0.03068	0.00240
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00166
3	House to east	468272	386638	0.00007	0.00575	0.00093
4	Mattersey Road	468558	386067	0.00003	0.00264	0.00029
5	Lound	468895	386146	0.00002	0.00193	0.00023
6	Lound	469046	386531	0.00002	0.00186	0.00030
7	North View	469083	387159	0.00002	0.00172	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00086	0.00015
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00022
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00019
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00032
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00035
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00009
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00002	0.00161	0.00017
20	College Farm	466102	385473	0.00001	0.00136	0.00015
Max				0.00025	0.03068	0.00240

model sensitivity analysis
met data variability
Scampton 2016
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00016	0.03068	0.00150
2	Daneshill Cottage	467047	386590	0.00008	0.01198	0.00083
3	House to east	468272	386638	0.00007	0.00575	0.00084
4	Mattersey Road	468558	386067	0.00002	0.00256	0.00024
5	Lound	468895	386146	0.00002	0.00193	0.00021
6	Lound	469046	386531	0.00002	0.00186	0.00026
7	North View	469083	387159	0.00003	0.00172	0.00033
8	Blaco Hill	469589	388011	0.00002	0.00090	0.00018
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00019
11	Lakeland House	467346	388611	0.00001	0.00140	0.00013
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00013
13	Bridge House	466143	388277	0.00001	0.00121	0.00016
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00025
15	Willow Avenue	466196	387589	0.00002	0.00176	0.00024
16	Lakeside Fishery	466351	387458	0.00002	0.00229	0.00029
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00008
18	Moat Farm	465851	386645	0.00001	0.00171	0.00008
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00008
20	College Farm	466102	385473	0.00001	0.00136	0.00004
Max				0.00016	0.03068	0.00150

model sensitivity analysis
met data variability
Scampton 2017
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00021	0.03068	0.00218
2	Daneshill Cottage	467047	386590	0.00013	0.01306	0.00128
3	House to east	468272	386638	0.00006	0.00575	0.00062
4	Mattersey Road	468558	386067	0.00002	0.00264	0.00028
5	Lound	468895	386146	0.00002	0.00190	0.00017
6	Lound	469046	386531	0.00002	0.00186	0.00019
7	North View	469083	387159	0.00002	0.00172	0.00022
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00016
11	Lakeland House	467346	388611	0.00001	0.00133	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00012
13	Bridge House	466143	388277	0.00002	0.00121	0.00024
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00036
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00037
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00017
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00016
20	College Farm	466102	385473	0.00001	0.00136	0.00010
Max				0.00021	0.03068	0.00218

model sensitivity analysis
met data variability
Scampton 2018
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00031	0.05341	0.00269
2	Daneshill Cottage	467047	386590	0.00020	0.02288	0.00217
3	House to east	468272	386638	0.00009	0.00928	0.00111
4	Mattersey Road	468558	386067	0.00003	0.00446	0.00032
5	Lound	468895	386146	0.00002	0.00320	0.00026
6	Lound	469046	386531	0.00003	0.00296	0.00034
7	North View	469083	387159	0.00003	0.00234	0.00035
8	Blaco Hill	469589	388011	0.00001	0.00149	0.00017
9	Lakefield	468917	388519	0.00002	0.00168	0.00018
10	Mattersey Hill	468172	388578	0.00002	0.00208	0.00025
11	Lakeland House	467346	388611	0.00002	0.00233	0.00012
12	Mattersey Road	466777	388399	0.00002	0.00250	0.00018
13	Bridge House	466143	388277	0.00002	0.00202	0.00023
14	Maltkiln Cottage	466239	387768	0.00003	0.00296	0.00038
15	Willow Avenue	466196	387589	0.00003	0.00317	0.00037
16	Lakeside Fishery	466351	387458	0.00004	0.00404	0.00044
17	Underwood Avenue	465818	387047	0.00002	0.00274	0.00012
18	Moat Farm	465851	386645	0.00002	0.00289	0.00017
19	Torworth Grange	465970	386001	0.00002	0.00275	0.00021
20	College Farm	466102	385473	0.00002	0.00222	0.00018
Max				0.00031	0.05341	0.00269

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 0.3m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc |ug/m3|BENZENE|<All sources>|-| 1hr	P100.00 |ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00 |ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00025	0.03068	0.00240
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00166
3	House to east	468272	386638	0.00007	0.00575	0.00093
4	Mattersey Road	468558	386067	0.00003	0.00264	0.00029
5	Lound	468895	386146	0.00002	0.00193	0.00023
6	Lound	469046	386531	0.00002	0.00186	0.00030
7	North View	469083	387159	0.00002	0.00172	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00086	0.00015
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00022
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00019
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00032
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00035
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00009
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00002	0.00161	0.00017
20	College Farm	466102	385473	0.00001	0.00136	0.00015
Max				0.00025	0.03068	0.00240

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc | ug/m3 | BENZENE | <All sources> | - | 1hr	P100.00 | ug/m3 | BENZENE | <All sources> | - | 1hr	P 98.00 | ug/m3 | BENZENE | <All sources> | - | 1hr
1	Travellers Site	467595	386491	0.00022	0.01970	0.00226
2	Daneshill Cottage	467047	386590	0.00012	0.00852	0.00158
3	House to east	468272	386638	0.00006	0.00371	0.00087
4	Mattersey Road	468558	386067	0.00002	0.00171	0.00026
5	Lound	468895	386146	0.00002	0.00126	0.00022
6	Lound	469046	386531	0.00002	0.00121	0.00027
7	North View	469083	387159	0.00002	0.00112	0.00028
8	Blaco Hill	469589	388011	0.00001	0.00054	0.00014
9	Lakefield	468917	388519	0.00001	0.00066	0.00015
10	Mattersey Hill	468172	388578	0.00002	0.00085	0.00022
11	Lakeland House	467346	388611	0.00001	0.00091	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00097	0.00013
13	Bridge House	466143	388277	0.00001	0.00078	0.00017
14	Maltkiln Cottage	466239	387768	0.00002	0.00115	0.00028
15	Willow Avenue	466196	387589	0.00002	0.00124	0.00028
16	Lakeside Fishery	466351	387458	0.00002	0.00155	0.00034
17	Underwood Avenue	465818	387047	0.00001	0.00106	0.00010
18	Moat Farm	465851	386645	0.00001	0.00112	0.00014
19	Torworth Grange	465970	386001	0.00001	0.00107	0.00018
20	College Farm	466102	385473	0.00001	0.00089	0.00014
Max				0.00022	0.01970	0.00226

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 1.0m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc | ug/m3 | BENZENE | <All sources> | - | 1hr	P100.00 | ug/m3 | BENZENE | <All sources> | - | 1hr	P 98.00 | ug/m3 | BENZENE | <All sources> | - | 1hr
1	Travellers Site	467595	386491	0.00023	0.01934	0.00258
2	Daneshill Cottage	467047	386590	0.00012	0.00944	0.00188
3	House to east	468272	386638	0.00007	0.00399	0.00103
4	Mattersey Road	468558	386067	0.00002	0.00171	0.00027
5	Lound	468895	386146	0.00002	0.00125	0.00022
6	Lound	469046	386531	0.00002	0.00122	0.00035
7	North View	469083	387159	0.00002	0.00115	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00056	0.00010
9	Lakefield	468917	388519	0.00001	0.00060	0.00017
10	Mattersey Hill	468172	388578	0.00002	0.00083	0.00023
11	Lakeland House	467346	388611	0.00001	0.00090	0.00012
12	Mattersey Road	466777	388399	0.00001	0.00092	0.00016
13	Bridge House	466143	388277	0.00001	0.00077	0.00022
14	Maltkiln Cottage	466239	387768	0.00002	0.00122	0.00036
15	Willow Avenue	466196	387589	0.00002	0.00127	0.00034
16	Lakeside Fishery	466351	387458	0.00002	0.00163	0.00041
17	Underwood Avenue	465818	387047	0.00001	0.00108	0.00009
18	Moat Farm	465851	386645	0.00001	0.00115	0.00021
19	Torworth Grange	465970	386001	0.00001	0.00106	0.00014
20	College Farm	466102	385473	0.00001	0.00091	0.00014
Max				0.00023	0.01934	0.00258

model sensitivity analysis
terrain effects
Scampton 2016
surface roughness 0.3m
terrain effects on

No	Receptor name	X(m)	Y(m)	LTConc | ug/m3 | BENZENE | <All sources> | - | 1hr	P100.00 | ug/m3 | BENZENE | <All sources> | - | 1hr	P 98.00 | ug/m3 | BENZENE | <All sources> | - | 1hr
1	Travellers Site	467595	386491	0.00031	0.05341	0.00269
2	Daneshill Cottage	467047	386590	0.00020	0.02288	0.00217
3	House to east	468272	386638	0.00009	0.00928	0.00111
4	Mattersey Road	468558	386067	0.00003	0.00446	0.00032
5	Lound	468895	386146	0.00002	0.00320	0.00026
6	Lound	469046	386531	0.00003	0.00296	0.00034
7	North View	469083	387159	0.00003	0.00234	0.00035
8	Blaco Hill	469589	388011	0.00001	0.00149	0.00017
9	Lakefield	468917	388519	0.00002	0.00168	0.00018
10	Mattersey Hill	468172	388578	0.00002	0.00208	0.00025
11	Lakeland House	467346	388611	0.00002	0.00233	0.00012
12	Mattersey Road	466777	388399	0.00002	0.00250	0.00018
13	Bridge House	466143	388277	0.00002	0.00202	0.00023
14	Maltkiln Cottage	466239	387768	0.00003	0.00296	0.00038
15	Willow Avenue	466196	387589	0.00003	0.00317	0.00037
16	Lakeside Fishery	466351	387458	0.00004	0.00404	0.00044
17	Underwood Avenue	465818	387047	0.00002	0.00274	0.00012
18	Moat Farm	465851	386645	0.00002	0.00289	0.00017
19	Torworth Grange	465970	386001	0.00002	0.00275	0.00021
20	College Farm	466102	385473	0.00002	0.00222	0.00018
Max				0.00031	0.05341	0.00269

Scenario 1
worst-case dispersopm conditons
Scampton 2016
surface roughness 0.3m
terrain effects off

No	Receptor name	X(m)	Y(m)	Benzene	Toluene	Ethylbenzene	Xylene
1	Travellers Site	467595	386491	0.00031	0.00495	0.00046	0.00124
2	Daneshill Cottage	467047	386590	0.00020	0.00322	0.00030	0.00080
3	House to east	468272	386638	0.00009	0.00146	0.00013	0.00036
4	Mattersey Road	468558	386067	0.00003	0.00051	0.00005	0.00013
5	Lound	468895	386146	0.00002	0.00037	0.00003	0.00009
6	Lound	469046	386531	0.00003	0.00045	0.00004	0.00011
7	North View	469083	387159	0.00003	0.00044	0.00004	0.00011
8	Blaco Hill	469589	388011	0.00001	0.00024	0.00002	0.00006
9	Lakefield	468917	388519	0.00002	0.00031	0.00003	0.00008
10	Mattersey Hill	468172	388578	0.00002	0.00040	0.00004	0.00010
11	Lakeland House	467346	388611	0.00002	0.00025	0.00002	0.00006
12	Mattersey Road	466777	388399	0.00002	0.00027	0.00003	0.00007
13	Bridge House	466143	388277	0.00002	0.00030	0.00003	0.00008
14	Maltkiln Cottage	466239	387768	0.00003	0.00048	0.00004	0.00012
15	Willow Avenue	466196	387589	0.00003	0.00050	0.00005	0.00013
16	Lakeside Fishery	466351	387458	0.00004	0.00062	0.00006	0.00016
17	Underwood Avenue	465818	387047	0.00002	0.00027	0.00003	0.00007
18	Moat Farm	465851	386645	0.00002	0.00031	0.00003	0.00008
19	Torworth Grange	465970	386001	0.00002	0.00035	0.00003	0.00009
20	College Farm	466102	385473	0.00002	0.00028	0.00003	0.00007
Max				0.00031	0.00495	0.00046	0.00124

Scenario 1
units = ug/m3

No	Receptor name	X(m)	Y(m)	Benzene	Toluene	Ethylbenzene	Xylene
1	Travellers Site	467595	386491	0.05341	0.85453	0.07904	0.21363
2	Daneshill Cottage	467047	386590	0.02288	0.36608	0.03386	0.09152
3	House to east	468272	386638	0.00928	0.14847	0.01373	0.03712
4	Mattersey Road	468558	386067	0.00446	0.07136	0.00660	0.01784
5	Lound	468895	386146	0.00320	0.05117	0.00473	0.01279
6	Lound	469046	386531	0.00296	0.04734	0.00438	0.01183
7	North View	469083	387159	0.00234	0.03742	0.00346	0.00936
8	Blaco Hill	469589	388011	0.00149	0.02377	0.00220	0.00594
9	Lakefield	468917	388519	0.00168	0.02692	0.00249	0.00673
10	Mattersey Hill	468172	388578	0.00208	0.03332	0.00308	0.00833
11	Lakeland House	467346	388611	0.00233	0.03735	0.00345	0.00934
12	Mattersey Road	466777	388399	0.00250	0.03996	0.00370	0.00999
13	Bridge House	466143	388277	0.00202	0.03234	0.00299	0.00809
14	Maltkiln Cottage	466239	387768	0.00296	0.04741	0.00439	0.01185
15	Willow Avenue	466196	387589	0.00317	0.05066	0.00469	0.01266
16	Lakeside Fishery	466351	387458	0.00404	0.06470	0.00598	0.01617
17	Underwood Avenue	465818	387047	0.00274	0.04385	0.00406	0.01096
18	Moat Farm	465851	386645	0.00289	0.04624	0.00428	0.01156
19	Torworth Grange	465970	386001	0.00275	0.04407	0.00408	0.01102
20	College Farm	466102	385473	0.00222	0.03547	0.00328	0.00887
Max				0.05341	0.85453	0.07904	0.21363

Scenario 1
units = ug/m3

APPENDIX 5

SOCOTEC

TEST REPORT ASC/39489

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31526

Date Samples Received: 12 June 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 13 June 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
4	ATD Tube - Tenax	ASC/SOP/211*	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH** - The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

*Sample ASC/39489.001, 164501, is classed as deviating due to the internal standard not meeting our criteria. These results therefore have a higher level of uncertainty.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
164501* BF1 MAY 19	ASC/39489.001*	08:57 10/05/19	10:05 10/05/19	Mi159027	<5	<10	<5	<10	<5	200
164503 BF2 MAY 19	ASC/39489.002	09:14 24/05/19	10:14 24/05/19	H0207919	<5	70	20	30	10	1700
164505 BF3 MAY 19	ASC/39489.003	12:38 31/05/19	13:01 31/05/19	Mi114677	<5	60	10	20	10	1100
164507 BF Manifold May 2019	ASC/39489.004	10:40 31/05/19	11:42 31/05/19	Mi002623	20	110	20	30	20	7100

1. *Sample ASC/39489.001, 164501, is classed as deviating due to the internal standard not meeting our criteria. These results therefore have a higher level of uncertainty.

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SOCOTEC

Results

Table 2: Concentration of BTEX Components and TPHs (µg/m³)

					Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
164501 BF1 MAY 19	ASC/39489.001	08:57 10/05/19	10:05 10/05/19	Mi159027	3.4	<2	<3	<2	<3	<2	60
164503 BF2 MAY 19	ASC/39489.002	09:14 24/05/19	10:14 24/05/19	H0207919	3.0	<2	20	5	10	4	510
164505 BF3 MAY 19	ASC/39489.003	12:38 31/05/19	14:01 31/05/19	Mi114677	3.7	<2	20	3	6	3	340
164507 BF Manifold MAY 2019	ASC/39489.004	10:40 31/05/19	11:42 31/05/19	Mi002623	3.2	5	30	5	9	4	2200

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/39919

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31704

Date Samples Received: 10 July 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 18 July 2019

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
2	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
165688 BF JUN 19	ASC/39919.001	11:05 28/06/19	12:05 28/06/19	Mi064791	<5	70	20	60	30	2200
165690 BF Manifold JUN 19	ASC/39919.002	10:00 28/06/19	11:00 28/06/19	Mi107378	30	140	40	100	40	23000

Table 2: Concentration of BTEX Components and TPHs ($\mu g/m^3$)

					Units	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
165688 BF JUN 19	ASC/39919.001	11:05 28/06/19	12:05 28/06/19	Mi064791	3.7	<2	20	6	20	7	970
165690 BF Manifold JUN 19	ASC/39919.002	10:00 28/06/19	11:00 28/06/19	Mi107378	2.3	8	40	10	30	10	10000

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/40426

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	31887
Date Samples Received:	06 August 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	16 August 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF JUL 19 166815	ASC/40426.001	11:45 30/07/19	12:45 30/07/19	Mi144436	<5	90	20	60	30	1100

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF JUL 19 166815	ASC/40426.001	11:45 30/07/19	12:45 30/07/19	Mi144436	3.0	<2	30	6	20	10	350

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/40948

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	32164
Date Samples Received:	11 September 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	02 October 2019

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211*	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH** - The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

*The internal standard level for sample ASC/40948.001 falls outside of our criteria; therefore the results are not UKAS Accredited.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF AUG 19 168575	ASC/40948.001	10:00 30/08/19	11:03 30/08/19	Mi002533	6*	510*	6*	10*	<5*	1100*

*The internal standard level for sample ASC/40948.001 falls outside of our criteria; therefore the results are not UKAS Accredited.

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF AUG 19 168575	ASC/40948.001	10:00 30/08/19	11:03 30/08/19	Mi002533	3.2	2	160	2	4	<2	360

END OF TEST REPORT

SOCOTEC

TEST REPORT ASC/41464

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 32436

Date Samples Received: 11 October 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 22 October 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF SEP 2019 170105	ASC/41464.001	10:55 02/10/19	11:58 02/10/19	Mi131798	<5	180	5	10	6	1400

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF SEP 2019 170105	ASC/41464.001	10:55 02/10/19	11:58 02/10/19	Mi131798	3.3	<2	53	2	4	2	420

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/37520

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 30639

Date Samples Received: 08 February 2019

Condition of Samples: Ambient and Satisfactory

Approved by:

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 18 February 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

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SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158915 BF JAN 19	ASC/37520.001	08:23 31/01/19	09:27 31/01/19	Mi114876	<5	40	6	20	6	700

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158915 BF JAN 19	ASC/37520.001	08:23 31/01/19	09:27 31/01/19	Mi114876	2.9	<2	10	<2	6	2	300

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/37932

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 30832

Date Samples Received: 06 March 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 11 March 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH** - The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
160147 BF FEB 19	ASC/37932.001	08:00 27/02/19	09:03 27/02/19	A25914	<5	60	20	60	20	1000

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
160147 BF FEB 19	ASC/37932.001	08:00 27/02/19	09:03 27/02/19	A25914	3.3	<2	20	6	20	5	300

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/38478

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	31096
Date Samples Received:	09 April 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	17 April 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
161646 BF MAR 19	ASC/38478.001	08:55 29/03/19	10:01 29/03/19	A16674	7	30	7	20	9	2100

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
161646 BF MAR 19	ASC/38478.001	08:55 29/03/19	10:01 29/03/19	A16674	3.3	2	10	2	7	3	640

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/39029

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31320

Date Samples Received: 14 May 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 21 May 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

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Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH** - The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

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Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
163215 BF APR 19	ASC/39029.001	09:32 29/04/19	10:35 29/04/19	Mi107378	8	50	20	40	10	2000

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
163215 BF APR 19	ASC/39029.001	09:32 29/04/19	10:35 29/04/19	Mi107378	3.2	3	20	5	10	4	620

END OF TEST REPORT

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LABORATORY ANALYSIS REPORT

Report Number	**M01545R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0237**
Despatch Note Number	**39939**
Date Samples Received	**21/02/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA10771**
Gradko Lab Reference	**04M0181**
Volume (Litres)	**3**
Sample ID	**BF JAN 18**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3}*
Benzene	U	<5	<1.7
Toluene	U	<5	<1.7
Ethylbenzene	U	<5	<1.7
m/p-Xylene	U	<5	<1.7
o-Xylene	U	<5	<1.7

	Estimated ng on tube	μgm^{-3}*
Total TPH	21	6.9

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Form LQF32b issue 7 – Oct 2016

Report Number M01545R

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L. Gates, Laboratory Manager

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St. Martins House, 77 [illegible]
tel: [illegible] fax: [illegible] e-mail: [illegible]@gradko.co.uk

LABORATORY ANALYSIS REPORT

Tube Number	**000569**
Gradko Lab Reference	**180227_TXTABLANK_27R**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limits for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**27/02/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**08/03/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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L. Gates, Laboratory Manager

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Report Number	**M05300R**
Customer	**Provectus Remediation Ltd** **Edwin Richard Quarry** **Rowley Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0843**
Despatch Note Number	**43011**
Date Samples Received	**27/07/2018**
Diffusion Tube Type	**Tenax**
Job Reference	**Quote-34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001639**
Gradko Lab Reference	**02M0831**
Sample Volume (L)	**3**
Sample ID	**BF July 18**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3}
Benzene	U	23.7	7.9
Toluene	U	33.3	11.1
Ethylbenzene	U	10.1	3.4
m/p-Xylene	U	45.4	15.1
o-Xylene	U	19.5	6.5
		Estimated ng on tube	μgm^{-3}
Total TPHs		714	238

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Tube Number	GRA 03916
Gradko Lab Reference	23_BLANKTXTA180809_27
Sample ID	Laboratory Blank

BTEX	Accreditation Status	ng on tube
Benzene	U	<5.0
Toluene	U	<5.0
Ethylbenzene	U	<5.0
m/p-Xylene	U	<5.0
o-Xylene	U	<5.0

	Estimated ng on tube
Total TPHs	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.5% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5.0ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	M.Angelova	Date of Analysis	08/08/2018
Report Checked By	G.Aikman	Date of Report	10/08/2018

Analysis has been carried out in accordance with in-house method GLM 13

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LABORATORY ANALYSIS REPORT

Report Number	**M06151R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0980**
Despatch Note Number	**43012**
Date Samples Received	**03/09/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA08815**
Gradko Lab Reference	**04M1074**
Volume (Litres)	**3**
Sample ID	**BF AUG 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3}*
Benzene	U	22.4	7.5
Toluene	U	27.5	9.2
Ethylbenzene	U	5.5	1.8
m/p-Xylene	U	25.2	8.4
o-Xylene	U	13.0	4.3

	Estimated ng on tube	µgm^{-3}*
Total TPH	1933	644

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA10597**	
Gradko Lab Reference	**180907_TXTABLANK_26**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**07/09/2018**
Report Checked By	**Len Gates**	**Date of Report**	**11/09/2018**

Analysis has been carried out in accordance with in-house method GLM 13

Report Number M36151R Page 2 of 2

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Report Number	**M07243R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V1171**
Despatch Note Number	**43013**
Date Samples Received	**15/10/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**Quote - 34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001639**
Gradko Lab Reference	**04M1176**
Volume (Litres)	**3**
Sample ID	**BF SEP 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3}*
Benzene	U	11.5	3.8
Toluene	U	14.8	4.9
Ethylbenzene	U	5.3	1.8
m/p-Xylene	U	20.1	6.7
o-Xylene	U	8.4	2.8

	Estimated ng on tube	µgm^{-3}*
Total TPH	397	132

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LABORATORY ANALYSIS REPORT

Tube Number
Gradko Lab Reference
Sample ID — **Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**22/10/2018**
Report Checked By	**Len Gates**	**Date of Report**	**24/10/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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[illegible], 77 Wales Street, Winchester, Hampshire [illegible]

Tel: [illegible] Fax: [illegible] email: [illegible]@gradko.co.uk

LABORATORY ANALYSIS REPORT

Report Number	**M07993R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowley Regis** **Birmingham, B65 9DS**
Booking In Reference	**V1298**
Despatch Note Number	**43015**
Date Samples Received	**14/11/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA11937**
Gradko Lab Reference	**04M1245**
Volume (Litres)	**3**
Sample ID	**BF NOV/2**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3}*
Benzene	U	6.8	2.3
Toluene	U	5.9	2.0
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	5.2	1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	μgm^{-3}*
Total TPH	67	22

Tube Number	**GRA10561**
Gradko Lab Reference	**181120_TXTABLANK_1**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

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Tel: [illegible]

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LABORATORY ANALYSIS REPORT

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	Katya Paldamova	Date of Analysis	21/11/2018
Report Checked By	Mariella Angelova	Date of Report	22/11/2018

Analysis has been carried out in accordance with in-house method GLM 13

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L. Gates, Laboratory Manager.

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Report Number	**M07994R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowley Regis** **Birmingham, B65 9DS**
Booking In Reference	**V1296**
Despatch Note Number	**43014**
Date Samples Received	**14/11/2018**
Diffusion Tube Type	**TXTA**
Job Number	**Quote 34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA10609**
Gradko Lab Reference	**04M1246**
Volume (Litres)	**3**
Sample ID	**BF OCT 18**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3*}
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	μgm^{-3*}
Total TPH	29	9.6

Tube Number	**GRA10561**
Gradko Lab Reference	**181120_TXTABLANK_1**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

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LABORATORY ANALYSIS REPORT

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	Katya Paldamova	Date of Analysis	21/11/2018
Report Checked By	Mariella Angelova	Date of Report	22/11/2018

Analysis has been carried out in accordance with in-house method GLM 13

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Signed..
L. Gates, Laboratory Manager

SOCOTEC

TEST REPORT ASC/37207

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 30523

Date Samples Received: 22 January 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 30 January 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH** - The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

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Results

Table 1: Amount of BTEX Components and TPH (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158193 BF DEC 18	ASC/37207.001	10:00 28/12/18	11:00 28/12/18	GRA 06998	40	30	<5	10	<5	800

Table 2: Concentration of BTEX Components and TPH (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158193 BF DEC 18	ASC/37207.001	10:00 28/12/18	11:00 28/12/18	GRA 06998	3	10	10	<2	4	<2	300

END OF TEST REPORT

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LABORATORY ANALYSIS REPORT

Report Number	**M01964R**
Customer	**Provectus Remediation**
	Edwin Richards Quarry
	Rowleg Regis
	Birmingham
	B65 9DS
Booking In Reference	**V0317**
Despatch Note Number	**42506**
Date Samples Received	**12/03/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA08329**
Gradko Lab Reference	**04M0316**
Volume (Litres)	**3**
Sample ID	**BF FEB 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3*}
Benzene	U	<5.0	<1.7
Toluene	U	6.0	2.0
Ethylbenzene	U	44.5	14.8
m/p-Xylene	U	32.7	10.9
o-Xylene	U	12.1	4.0

	Estimated ng on tube	µgm^{-3*}
Total TPH	187	62.4

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA06174**	
Gradko Lab Reference	**BLANKTXTA180327_22**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limits for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**26/03/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**05/04/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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L. Gates, Laboratory Manager

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Report Number	**M02682R**
Customer	**Provectus Remediation Ltd** **Edwin Richard Quarry** **Rowley Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0423**
Despatch Note Number	**43007**
Date Samples Received	**09/04/2018**
Diffusion Tube Type	**Tenax**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA 09210**
Gradko Lab Reference	**02M0533**
Sample Volume (L)	**3**
Sample ID	**BF MAR 18**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3}
Benzene	U	6.9	2.3
Toluene	U	15.9	5.3
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	5.7	1.9
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	μgm^{-3}
Total TPHs	200	67

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Tube Number	**GRA 10349**
Gradko Lab Reference	**BLANKTXTA180416_2**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5.2
Toluene	U	<5.0
Ethylbenzene	U	<5.0
m/p-Xylene	U	<5.0
o-Xylene	U	<5.0

	Estimated ng on tube
Total TPHs	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.5% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5.2ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**M.Angelova**	**Date of Analysis**	**16/04/2018**
Report Checked By	**Len Gates**	**Date of Report**	**23/04/2018**

Analysis has been carried out in accordance with in-house method GLM 13

REPORT OFFICIALLY CHECKED

Gradko International Ltd
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Signed.....
L. Gates, Laboratory Manager

gradko

(A Division of [illegible])
St. Martins House, 77 [illegible] Winchester, Hampshire [illegible]
Tel: [illegible] E-mail: diffusion@gradko.co.uk

ilac-MRA UKAS TESTING 2187

LABORATORY ANALYSIS REPORT

Report Number	**M03166R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0492**
Despatch Note Number	**43008**
Date Samples Received	**01/05/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA06929**
Gradko Lab Reference	**04M0484**
Volume (Litres)	**3**
Sample ID	**BF APR 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3}*
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	µgm^{-3}*
Total TPH	20	6.8

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Form [illegible] Issue 7 – [illegible]

Report Number M03166R

Page 1 of 2

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA10349**	
Gradko Lab Reference	**180508_TXTABLANK_2**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**08/05/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**09/05/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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LABORATORY ANALYSIS REPORT

Report Number	**M03605R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0556**
Despatch Note Number	**43009**
Date Samples Received	**16/05/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**Quote-34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA11318**		
Gradko Lab Reference	**04M0562**		
Volume (Litres)	**3**		
Sample ID	**BF MAY 18**		
BTEX	**Accreditation Status**	**ng on tube**	**μgm^{-3*}**
Benzene	U	<5.0	<1.7
Toluene	U	6.0	2.0
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	**μgm^{-3*}**
Total TPH	20	6.6

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Form LQF3[illegible] Issue 7 [illegible] Report Number M03605R Page 1 of 2

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LABORATORY ANALYSIS REPORT

Tube Number	**001763**	
Gradko Lab Reference	**180521_TXTABLANK_2**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**21/05/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**25/05/2018**

Analysis has been carried out in accordance with in-house method GLM 13

Report Number M03665R   Page 2 of 2

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UKAS TESTING 2187

LABORATORY ANALYSIS REPORT

Report Number	**M04764R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0742**
Despatch Note Number	**43010**
Date Samples Received	**05/07/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**7032/100993/CGO**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001783**		
Gradko Lab Reference	**04M0874**		
Volume (Litres)	**3**		
Sample ID	**BF JUN 18**		
BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	µgm^{-3}*
Total TPH	85	28

[illegible]

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2187

LABORATORY ANALYSIS REPORT

Tube Number	**GRA02968**	
Gradko Lab Reference	**180718_TXTABLANK_1**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**17/07/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**20/07/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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Activities & Operating Techniques Report
January 2021

CAULMERT LIMITED

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Activities & Operating Techniques Report

Environmental Permit Variation Application

Prepared by:

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Doc ref: 3982-CAU-XX-XX-RP-V-0305-A0.C1

January 2021

APPROVAL RECORD

Site:	Daneshill Landfill - Soils Treatment Facility
Client:	FCC Environment Ltd
Project Title:	Daneshill Soils Treatment Facility
Document Title:	Activities & Operating Techniques Report
Document Ref:	3982-CAU-XX-XX-RP-V-0305-A0.C1
Report Status:	**Final**
Project Manager:	Andy Stocks
Caulmert Limited:	14 Farrington Way, Eastwood Link Business Park, Eastwood, Notts, NG16 3BF
Tel:	01773 749132

Author	Kellie-Marie P. Burston	**Date**	15/01/2021
Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

TABLE OF CONTENTS

Tables

DRAWINGS

1.1 Document context

1.1.1 This Activities and Operating Techniques Report is in response to the environmental permit application form C3 for bespoke installation permits.

1.1.2 The C3 form requests information about the activities the application relates to and the operating techniques that will apply to them. Information is requested on: -

a) Types of activities;

b) Types of waste to be accepted;

c) Emissions;

d) Operating techniques including technical standards;

e) General requirements in relation to amenity and accident risks;

f) Types and amounts of raw materials;

g) Information for specific sectors (hazardous and non-hazardous waste recovery and disposal sector);

h) Monitoring of point source emissions;

i) Resource efficiency and climate change.

1.2 Document structure

1.2.1 This 'Activities and Operating Techniques Report' has been prepared to provide responses to the environmental permit application form part C3 which relates to the issues listed above. To aid cross-referencing between this 'Activities and Operating Techniques Report' and the application form, the various issues are presented in the same order as in the application form and the headings in this document include reference to the specific question number to which the information relates.

2.1 Activities to be varied (Part C3 question 1)

2.1.1 The activities proposed includes physico-chemical and biological waste treatment of hazardous wastes for recovery, together with the temporary storage of hazardous waste.

Table 1: Types of activities

Name	Installation Schedule 1 reference	Description of the installation activity	Activity Capacity	Annex I and Annex II codes	Hazardous Waste Treatment Facility
Bioremediation process for hazardous waste	Section 5.3 Part A(1) (a)(i)	Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;	29,999 tonnes	R5 D8	29,999 tonnes
Handpicking & Pre-screening of asbestos contaminated soils	S5.3 A(1) (a) (ii)	Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment	29,999tonnes	R5 D8	29,999 tonnes
Bioremediation process for Non-hazardous waste	Section 5.4 Part A(1) (a)(i)	Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;	20,001 tonnes	R5 D8	20,001 tonnes
Temporary Hazardous Waste Storage	S5.6 A (1) (a)	Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;	<29,999 tonnes	R5 D8	29,999 tonnes

Table 2 Directly associated activities

Directly associated activities	
Name of DAA	Description of the DAA (including which Schedule 1 activity it serves)
Fuel Storage	Storage of diesel.
Water storage	Collection and storage of process water
Storage of Waste	Temporary storage of non-haz waste
Screening waste	Screening of non-hazardous waste to remove oversized material after the completion of bioremediation for use in the restoration areas
For installations that take waste	
Total storage capacity	50,000 tonnes
Annual throughput	Waste treatment: 50,000 t

2.2 Types of waste accepted (Part C3 question 1)

2.2.1 The waste types proposed are listed below in Table 3 and 3A. Raw materials for the use as part of the treatment process is detailed in Section 9 'Resource Use – Raw Materials' of the "Treatment Process & SGN 5.06 Indicative BAT review" report document ref: 3982-CAU-XX-XX-RP-V-0306.

Table 3: Wastes to be accepted for physical treatment of waste

01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**
01 05	**drilling muds and other drilling wastes**
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing hazardous substances
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 05*	oil spills
05 01 15*	spent filter clays
13	**Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)**
13 05	**oil/water separator contents**
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing hazardous substances

17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 05*	construction materials containing asbestos
17 09	**other construction and demolition wastes**
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 05*	construction materials containing asbestos
17 09	**other construction and demolition wastes**
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 04*	premixed wastes composed of at least one hazardous waste – wastes suitable for biological treatment only
19 02 05*	sludges from physico/chemical treatment containing hazardous substances – wastes suitable for biological treatment only
19 02 11*	other wastes containing hazardous substances – wastes suitable for biological treatment only
19 08 13*	sludges containing hazardous substances from other treatment of industrial wastewater
19 13	**wastes from soil and groundwater remediation**
19 13 01*	solid wastes from soil remediation containing hazardous substances
19 13 03*	sludges from soil remediation containing hazardous substances

Table 3A: Wastes to be accepted for treatment in the bioremediation process

01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**
01 05	**drilling muds and other drilling wastes**
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing hazardous substances
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 05*	oil spills
13	**Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)**
13 05	**oil/water separator contents**
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators

13 05 03*	interceptor sludges
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing hazardous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 04*	premixed wastes composed of at least one hazardous waste – wastes suitable for biological treatment only
19 02 05*	sludges from physico/chemical treatment containing hazardous substances – wastes suitable for biological treatment only
19 02 11*	other wastes containing hazardous substances – wastes suitable for biological treatment only
19 08	**wastes from wastewater treatment plants not otherwise specified**
19 08 13*	sludges containing hazardous substances from other treatment of industrial wastewater
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances
19 13	**wastes from soil and groundwater remediation**
19 13 01*	solid wastes from soil remediation containing hazardous substances
19 13 03*	sludges from soil remediation containing hazardous substances
20	**Municipal Wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions**
20 03	**Other municipal wastes**
20 03 03	Street cleaning residues

3 EMISSIONS (PART C3 QUESTION 2)

3.1 Point source emission to air

3.1.1 Air forced down through the biopiles via the extraction pipework system will pass through a biofilter before being released to air.

3.1.2 The blower connects to a manifold with several perforated pipes covered in stone sitting on an impermeable surface. Overlying these pipes is oversize compost or woodchip mixture, nutrients and small amount of contaminated soil (<5%) to inoculate the biofilter placed to an average height of 1.5m. The compost/nutrient/soil mixture is overlain by an

irrigation pipe network on top to maintain the moisture content and covered with a tarpaulin to ensure the biofilter does not dry out. It is then tested every month to ensure the process parameters are within the optimal range. Olfactory odour checks are also undertaken daily.

3.2 Point source emission to sewers, effluent treatment plants or other transfers off site

3.2.1 Water draining from beneath the biopiles or from the impermeable pad will pass into a holding tank, waters will be treated and stored prior to reuse in the biotreatment works or collection and disposed off site to a suitable treatment facility.

3.2.2 There will be no other point source emissions.

3.3 Point source emission to water (other than sewers)

3.3.1 There are existing surface water emission points relating to the landfill activity, however no direct discharge to surface water is proposed as part of this activity.

3.4 Point source emission to land

3.4.1 Treated soils will be used for the restoration of the landfill as treatment for recovery purposes; no disposal will be carried out with the exception of inclusions removed during the physical treatment of soils. This activity will be permitted as a recovery operation through a Waste Recovery Restoration Plan associated with the landfill activity.

4.1 Technical standards (Part C3 question 3a)

Table 4: Technical standards – waste treatment

Description of Schedule 1 activity or directly associated activity	Relevant technical guidance note or Best available techniques as described in BAT conclusions under IED	Document reference
Activity ref A1: Activities detailed in Table 1	Sector Guidance Note IPPC S5.06: Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste. Best Available Techniques (BAT) Reference Document for Waste treatment Industrial Emissions Directive (Integrated Pollution Prevention and Control)	Process description in section 5 of this document & *'SGN 5.06 indicative BAT review'* (doc. ref. 3982-CAU-XX-XX-RP-V-0306) included within this application H1 Assessment: - Amenity and Accident Risk Assessment (document ref 3982-CAU-XX-XX-RP-V-0303) FCC Management System

4.1.1 For many installation activities, a 'sector guidance note' (SGN) have been published which sets out in detail the indicative 'best available techniques' (BAT) standards for how to carry out those activities. The sector guidance notes are based on European BAT reference document (BREFs) that are intended to ensure European consistency in the understanding of what is BAT for a certain sector.

4.1.2 There is a specific SGN for waste treatment, which is 'Sector Guidance Note IPPC S5.06. Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste' and 'Best Available Techniques (BAT) Reference Document for Waste Treatment' IPPC, 2018.

4.1 Operating Techniques – Existing Permit (Part C3 question 3a1)

4.1.1 Operating techniques relating to the landfill operation will remain unchanged. The acceptance of soils from the STF to be used in the restoration of the landfill.

4.2 General requirements – amenity and accidents (Part C3 question 3b)

4.2.1 It is a general requirement for all applications to consider the risk of emissions in relation to possible accidents, fugitive emissions, odour and noise and vibration. Risk assessments were carried out using the Environment Agency's templates for amenity and accident risk assessments as set out in guidance:

'Daneshill Noise Impact Assessment' doc ref: R20.13365-2-AG

'Amenity and Accidents Risk Assessment' doc ref: 3982-CAU-XX-XX-RP-V-0303

'Odour Management Plan' doc ref: 3982-CAU-XX-XX-RP-V-0308

'Emissions Management Plan doc ref: 3982-CAU-XX-XX-RP-V-0309

4.3 Types and amounts of raw materials (Part C3 question 3c)

Raw materials

4.3.1 The use of raw materials is proposed as part of the treatment process.

Raw materials other than water

4.3.2 The types and quantities of raw materials used are detailed within the BAT assessment but consist primarily of the following substances:

- Standard NPK fertiliser 25:05:05 ratio, typically added at 1kg/tonne of soil per application so for 3 applications for 29,999t of hazardous hydrocarbon impacted soil this would be 100t/yr of nutrient use as a worst-case scenario.
- An organic additive such as woodchip is occasionally added, anticipated a maximum of up to 1,500tonnes per annum, a maximum of ~5% amendment to clayey soils to break up the cohesive nature of the soils and aid aeration. The biodegradation of the organic contaminants can be enhanced by addition of very low concentrations of organic material such as woodchip. Other raw materials include the use of street cleaning residues and off-specification compost. Use of these raw materials replaces virgin materials such as manufactured fertiliser and using 'waste raw materials' which would otherwise be landfilled. – Further details are included in Section 9 'Resource Use- Raw Materials' of the 'Treatment Process & SGN 5.06 Indicative BAT review, document ref: 3982-CAU-XX-XX-RP-V-0306.
- Flocculants maybe used to remove suspended solids from surface water runoff
- Sand and activated carbon used as part of the water treatment process

4.3.3 The operator will select the least harmful products to use in the operation wherever possible.

4.3.4 The operator will keep Material Safety Data Sheets for all products used at the facility and will monitor the quantity of materials used. This will provide data for regular reviews of raw materials usage at the facility.

Water use

4.3.5 Water usage is small and limited to, general cleaning and domestic use.

5. INFORMATION FOR SPECIFIC SECTORS (PART C3 QUESTION 3D)

5.1 Part C3 Question 1: Pre-acceptance procedures

5.1.1 Detailed within section 5 of Treatment Description & SGN 5.06 Indicative BAT Review.

5.2 Part C3 Question 2: Waste acceptance procedures

5.2.1 Detailed within Treatment Description & SGN 5.06 Indicative BAT Review.

5.3 Part C3 Question 3: Waste storage procedures and infrastructure

5.3.1 Detailed within Treatment Description & SGN 5.06 Indicative BAT Review

5.4 Part C3 Question 4: Layout plan

5.4.1 Please refer to 'Proposed Site Layout' plan drawing ref: 3982-CAU-XX-XX-DR-V-1805 which details the proposed layout and treatment operations of the site. Drawing ref: 3982-CAU-XX-XX-DR-V-1806 details the proposed section drawings of the treatment pads and drainage systems.

5.5 Part C3 Question 5: Summary of the treatment activities

5.5.1 Detailed within section 2 of Treatment Description & SGN 5.06 Indicative BAT Review

5.6 Part C3 Question 6: Layout plans and process flow diagrams

5.6.1 Detailed within section 2 of Treatment Description & SGN 5.06 Indicative BAT Review

6.1 Measures for monitoring point source emissions (Part C3 question 4a)

Emissions to air

6.1.1 Daily olfactory monitoring of biofilter is proposed in addition to the biofilter sampling and testing. See section 7 of the Treatment Description & SGN 5.06 Indicative BAT Review. In addition, particulate asbestos fibre monitoring will be carried out during asbestos processing operations, albeit this has not been shown to be elevated above the detection limit at any point during asbestos impacted soils treatment on the Operator's other site.

Emissions to sewers, effluent treatment plants or other transfers off site

6.1.2 Excess process and surface water will be directed to on-site holding tanks for treatment prior to any reuse in the biotreatment works with any surplus collected and disposed of at a suitable treatment facility.

Emissions to water (other than sewers)

6.1.3 There are no discharges to surface water resulting from this application.

7.1 Basic measures for improving energy-efficiency of activities (Part C3 Question 6a)

7.1.1 The company will operate in accordance with ISO50001 Energy Management System.

7.1.2 Please refer to treatment process description & SGN 5.06 indicative BAT review document (Ref: 3982-CAU-XX-XX-RP-V-0306) included with this application for further detail.

7.2 Breakdown of changes to the energy used and created (Question 6b)

7.2.1 The anticipated changes in energy use are not considered to be significant.

7.3 Climate-change levy agreement or specific measures (Part C3 Question 6c)

7.3.1 Not applicable to this application.

7.4 Raw and other materials, other substances and water to be used (Part C3 Question 6d)

Raw materials other than water

7.4.1 The types and quantities of raw materials were provided in response to question 3c.

7.4.2 Raw materials use within the treatment facility are detailed in section 4.3.

7.4.3 The operator will select the least harmful products to use in the operation wherever possible.

7.4.4 The operator will keep Safety Data Sheets (SDS) for all products used at the facility and will monitor the quantity of materials used. This will provide data for regular reviews of raw materials usage at the facility.

7.5 Compliance with the Council Directive 2006/12/EC on waste (Part C3 Question 6e)

7.5.1 With respect to the Waste Framework Directive, the installation is operated to optimise efficiency with regards to the hierarchical approach required by the Directive.

7.5.2 In relation to the prevention of waste generation these activities onsite do not generate significant volumes of additional waste. Treated soils will be used in the restoration of the landfill which will be undertaken as a recovery activity.

8.1.1 Directive 2008/98/EC of the European and of the Council of 19 November 2008 on waste and repealing certain Directives.

8.1.2 The Environmental Permitting (England and Wales) Regulations 2016

8.1.3 Environment Agency (2007): Sector Guidance Note IPPC S5.06. Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste.

8.1.4 Environment Agency (2013): Understanding the meaning of regulated facility. RGN 2 version 3.0.

8.1.5 Environment Agency (2017): Application for an environmental permit – Part C3 – variation to a bespoke installation permit. Version 9, January 2017.

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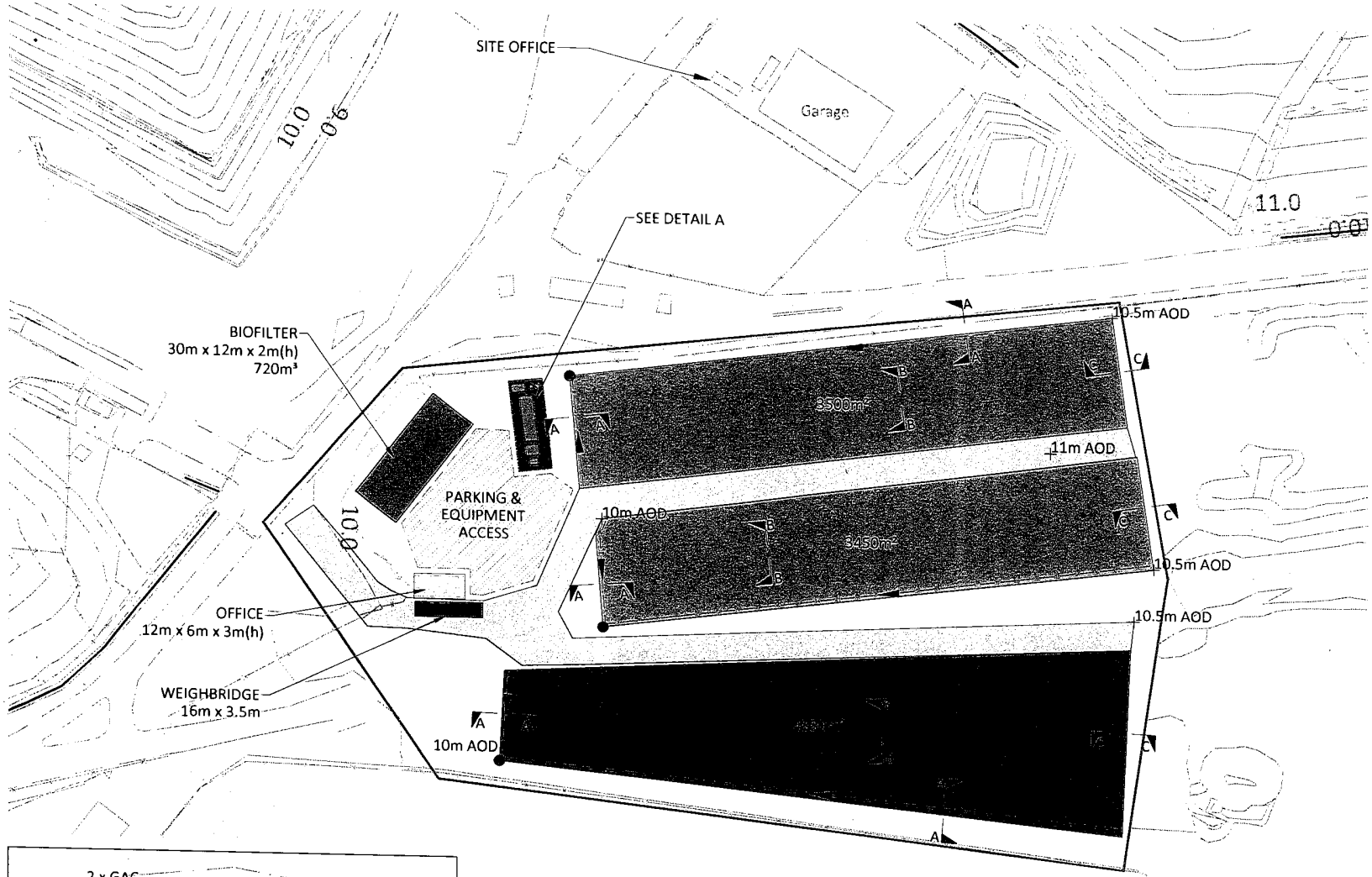

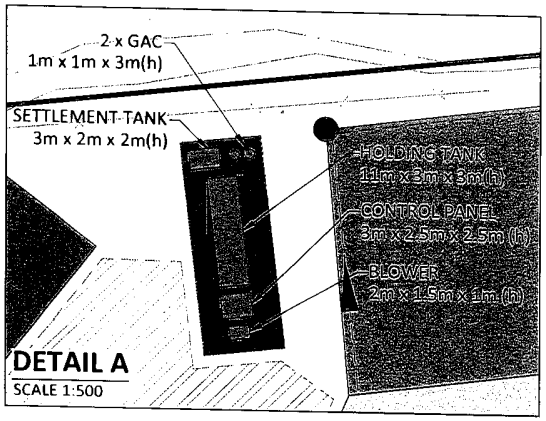

DETAIL A
SCALE 1:500

SITE LAYOUT
SCALE 1:1000

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- SECTION LINES
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING
- ACCESS ROAD
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P2	LEGEND UPDATED	EJD	KB	AS	24.03.20
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: PROPOSED LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF:	REVISION
04.02.2020	AS SHOWN	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1805

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Environmental Permit Variation Application
Non Technical Summary

January 2021

Caulmert Limited

Engineering, Environmental & Planning

Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Environmental Permit Variation Application

Non-Technical Summary

Prepared by:

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Web: www.caulmert.com
Document Reference: 3982-CAU-XX-XX-RP-V-0302-A0.C1

January 2021

Caulmert
engineering environmental planning

APPROVAL RECORD

Site:	Daneshill Landfill Site
Client:	FCC Environment (UK) Limited
Project Title:	Daneshill Landfill Permit Variation
Document Title:	Non-technical Summary
Document Ref:	3982-CAU-XX-XX-RP-V-0302-A0.C1
Report Status:	**Final**
Project Manager:	Andy Stocks
Caulmert Limited:	14 Farrington Way, Eastwood link Business Park, Eastwood, Nottinghamshire, NG16 3BF
Tel:	01773 749132

Author	Kellie-Marie P. Burston	**Date**	15/01/2021
Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021

DISCLAIMER

This report has been prepared by Caulmert Limited with all reasonable skill, care and diligence in accordance with the instruction of the above named client and within the terms and conditions of the Contact with the Client.

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Non-Technical Summary

1.1.1 Daneshill Landfill Site is located approximately located approximately 11km north east from the centre of Worksop at National Grid Reference SK6755086750.

1.1.2 Daneshill Landfill site operates under permit number EPR/NP3538MF which was issued in for the landfill site on 13th November 2009 and underwent subsequent variations. The most recent variation was issued in January 2017 for a permit review undertaken by the Environment Agency to conform to the current EPR permit format.

1.1.3 This permit variation is to allow for the construction of a soils treatment facility (STF) within the footprint of the existing permit for Daneshill Landfill Site.

1.1.4 Landfill permit includes Section 5.3 Part A(1) (a) (i) activity for leachate treatment in addition to the 5.2 landfill activity.

1.1.5 It is proposed to add the following listed activities to the current permit to facilitate this proposed operation

- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.1.6 The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous soils and 20,0001 tonnes of non-hazardous soils per annum. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

1.1.7 Treatment areas at Daneshill Landfill Site consist of two pads measuring at 3500m^2 and 3450m^2 for biotreatment and asbestos screening/processing, and a separate asbestos screening/processing pad with a treatment area of 4880m^2. The proposed site layout can be seen in drawing reference: 3982-CAU-XX-XX-DR-V-1805.

1.1.8 The proposed bioremediation process will utilise industry standard biopile technology, hazardous soils containing asbestos will undergo pre-acceptance checks, pre-screening and handpicking of asbestos fragments. Bioremediation will operate through the use of biopiles

and moisture control, addition of suitable nutrients to the soil and forced air extraction to encourage micro-organism growth leading to the breakdown of hydrocarbons into by-products such as carbon dioxide and water vapour.

1.1.9 Hazardous soils containing bound asbestos debris will undergo a pre-screening process and hand-picking of asbestos fragments.

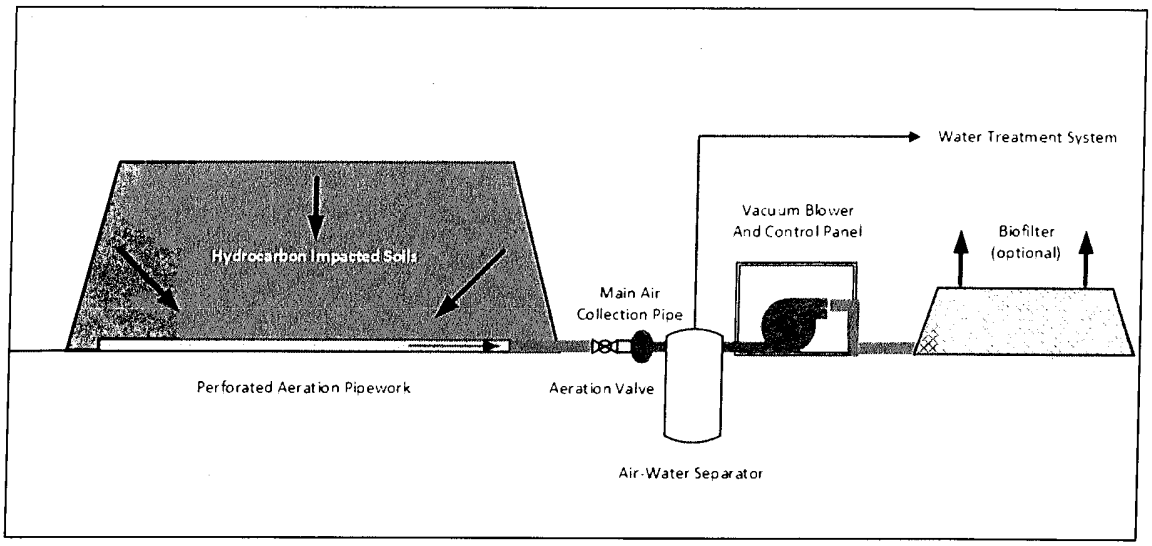
1.1.10 Non-hazardous soils will be screened to remove oversize inclusions prior for use in restoration after validation testing is complete.

1.1.11 The biopiles will be placed on water and air extraction pipes connected to a blower that will draw air through the soils where it is then passed through a biofilter before being discharged to air. Excess water draining through the soils will be collected and treated to remove any oils or suspended solids.

1.1.12 As there is no proposed surface water/foul sewer connections from the waste storage/treatment areas, the crushed concrete pads with underlying geo-composite clay liner (GCL) will be constructed with sealed drainage where all waters will fall and be collected to onsite holding tanks which will be treated for reuse in the biopile or disposed of offsite at a suitable treatment facility.

1.1.13 All wastes will be assessed to ensure that it comprises biologically treatable substances and subject to pre-characterisation as detailed in the sites Waste Acceptance Procedures. Hazardous soils containing bound asbestos will undergo a preassessment to confirm that there are no chrysotile fibres >0.1%,other forms of asbestos >0.01%, and also within the agreed background reference levels, upon satisfactory results, the soils will then undergo pre-screening and hand-picking. Monitoring for airborne asbestos emissions will be undertaken to ensure that operations do not result in fibre emissions detected above limits stated or above the background reference level.

1.1.14 The facility will be limited to accepting wastes that can be treated to a point where they can be used for restoration soils on the landfill area in accordance with the approved restoration plan.



1.1.15 The point emissions from the STF include process water, surface water collection and air emissions from the biofilter as well as dust and odour from general site works. The monitoring for these processes includes:

- Biofilter sampling (from exhaust vents)
- Process water sampling
- Visual and olfactive daily assessment for dust and odour on site.
- Dust monitoring (both total dust and airborne asbestos monitoring as separate activities)

1.1.16 This application proposes a list of hazardous and non-hazardous wastes to be accepted at the STF facility, which is included within the Supporting Document, ref: 3982-CAU-XX-XX-RP-V-0300 of this application.

1.1.17 Risk assessments have been provided to accompany this permit variation along with an addendum to the original Environmental Setting and Installation Design (ESID) report under document reference 3982-CAU-XX-XX-RP-V-0304.

1.1.18 An assessment has been undertaken to confirm compliance of the proposed new contaminated soils treatment facility at Daneshill Landfill with the sector guidance note for the recovery and disposal of hazardous (SGN 5.06).

1.1.19 Daneshill Landfill and the associated activities on site are managed by the Operator in accordance with a management system which meets the standard set in the Environment Agency Guidance 'Getting the Basics Right'.

1.1.20 The Operator will also implement a number of site-specific procedures and documents to control the operations at the site. A summary of the Management system is detailed within the application.

Environmental Permit Variation Application
Supporting Document

January 2021

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Environmental Permit Variation Application

Supporting Document

Prepared by

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Doc Ref: 3982-CAU-XX-XX-RP-V-0300-A0.C1

January 2021

Caulmert
engineering environmental planning

APPROVAL RECORD

Site:	**Daneshill Landfill Site**
Client:	**FCC Recycling (UK) Ltd**
Project Title:	**Daneshill Soils Treatment Facility**
Document Ref:	**3982-CAU-XX-XX-RP-V-0300-A0.C1**
Report Status:	**Final**
Project Manager:	**Andy Stocks**
Caulmert Limited:	**14 Farrington Way, Eastwood Link Business Park, Eastwood, Notts, NG16 3BF**
Tel:	**01773 749132**

Author	Kellie-Marie P. Burston	**Date**	15/01/2021
Reviewer	A Stocks	**Date**	15/01/2021
Approved	A Stocks	**Date**	15/01/2021

DISCLAIMER

TABLE OF CONTENTS

Appendices

Drawing

1 INTRODUCTION

1.1 Application context

1.1.1 FCC Recycling (UK) Ltd, a wholly owned subsidiary of FCC Environment Ltd (hereafter referred to as the 'Operator') operate Daneshill Landfill Site, located approximately 11km north east from the centre of Worksop at National Grid Reference SK6755086750.

1.1.2 Caulmert Limited were appointed by the operator to prepare an application to vary the existing Daneshill Landfill Site permit (EPR/NP3538MF) to include a Soil Treatment Facility (STF) on the former aggregates recycling pad within the landfill site boundary.

1.1.3 The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous soils and 20,001 of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site The maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

1.1.4 Treatment areas at Daneshill Landfill Site consist of two pads measuring at 3500m^2 and 3450m^2 for biotreatment and asbestos screening/processing, and a separate asbestos screening/processing pad with a treatment area of 4880m^2. The proposed bioremediation process will utilise industry standard biopile technology and will operate through the use of biopiles and moisture control, addition of suitable amendments to the soil, forced air extraction to encourage micro-organism growth and breakdown of hydrocarbons into by-products such as carbon dioxide and water vapour. Hazardous soils containing bound asbestos debris will undergo a pre-screening process and hand-picking of asbestos fragments. Soils will typically be treated over an 8-16 week period, with the material being turned infrequently, typically once every 8 weeks. The bioremediation plant will operate continuously.

1.1.5 Non-hazardous soils (including hazardous soils which have been treated), maybe screened to remove oversize inclusions, prior to use in the restoration of the site, after validation testing is complete to ensure they are physically suitable. Following screening, the soils will be stockpiled for use in recovery at Daneshill Landfill Site, this may also include soils that have undergone bioremediation process to remove oversized materials.

1.1.6 The facility will be limited to accepting wastes that can be treated to a point where they can be used as final restoration of the landfill area.

1.2 Document structure

1.2.1 This Supporting Document has been prepared to provide additional information to support the information provided in Parts C2 and C3 of the environmental permit application form for varying a bespoke installation permit. To aid cross-referencing between this document and the application form, the various issues are presented in the same order as in the application form and the headings in this document include the specific question number to which the information relates.

2 APPLICATION FORM PART A

2.1 Part A - 5c: details of the directors

2.1.1 Details of directors for FCC Recycling (UK) Limited are as detailed below, Dates of Birth for Relevant Persons are included in Appendix 1 (omitted from Public Register)

Name of Directors
Mr Agustin Serrano Minchan
Mr Vicente Federico Orts-Llopis
Paul Taylor

3 EXISTING PERMIT AND PRE-APPLICATION DISCUSSIONS

3.1 Part C2 – 1b: Pre-application discussions

3.1.1 Pre-application advice request was submitted to the EA. A copy of the formal response (ref EA/EPR/NO3538MF) is contained within Appendix 2.

3.2 Part C2 – 1c: Permit number

3.2.1 The permit (EPR/NP3538MF) for the landfill was first issued to FCC Recycling (UK) Limited on the 13th November 2009 and underwent subsequent variations. The most recent variation was in January 2017 of which a permit review was undertaken by the Environment Agency in January 2017 to conform to the current EPR permit format.

4.1 Part C2 – 2a: Type of variation

4.1.1 The Application has been prepared on the basis of adding an activity to an existing permit

4.2 Part C2 – 2b: Changes to existing activities

4.2.1 The application question 2b requests that information should be given about changes to existing activities. There are no changes to the existing activities as the application proposes to add a new activity to the permit.

4.2.2 The permit currently relates to the installation which is Daneshill Landfill along with its related activities.

4.2.3 This variation application is to permit the operation of a soils treatment facility capable of treating up to a maximum of 29,999 tonnes per annum of hazardous soils and 20,0001 tonnes of non-hazardous soils per annum. Treated soils to be accepted under the landfill activity as a recovery operation with some residual waste removed off site for disposal. The Site is to be located on land adjacent to Daneshill landfill but within the existing permit boundary.

4.2.4 Proposed bioremediation process will utilize standard biopile technology with forced air extraction. Asbestos containing soils will undergo pre-acceptance, pre-screening and handpicking of asbestos fractions. Wastes containing organic contamination will also undergo biotreatment to eliminate any hazardous hydrocarbon impact.

4.2.5 Any surplus surface water will be collected and stored in a bunded tank before being tankered off site and treated at a suitable facility or treated for reuse in the biopile.

4.2.6 Landfill permit includes Section 5.3 Part A(1) (a) (i) activity for leachate treatment in addition to the 5.2 activity. The permit currently permits the acceptance of waste (incl 19 13 02) as a recovery operation in accordance a Restoration Plan.

4.2.7 It is proposed to add the following listed activities to the current permit to facilitate this proposed operation.

- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;

- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

5.1 Part C2 – 3a: Relevant offences

5.1.1 There are no relevant convictions that require declaration.

5.2 Part C2 – 3b: Technical ability

5.2.1 FCC Environment has recently introduced a Competency Management System (CMS), which has been certified by its accrediting body.

5.2.2 The Competency Management System is an alternative mechanism to the Certificate of Technical Competence (COTC) / Technically Competent Management (TCM) regime for demonstrating competence at sites with PPC permits.

5.2.3 Further details are provided within the Management System Summary, document Reference: 3982-CAU-XX-XX-RP-V-0301-A0-C1 contained within Appendix 3.

5.3 Part C2 – 3d: Management system

5.3.1 Daneshill Landfill and the associated activities on site are managed by the operator in accordance with a management system which meets the standard set out in Environment Agency guidance 'Getting the Basics Right'.

5.3.2 FCC Recycling (UK) Limited operates a quality management system which has been approved by LRQA to the following standards:

Competency Management System – Energy & Utility Skills (Private Standard) Version 4

5.3.3 A copy of the certificate is contained within Appendix 4.

5.3.4 Whilst FCC Recycling (UK) Ltd will operate the site, Provectus Remediation Ltd will provide technical assistance for the operation of the STC as required. Provectus technical staff to be involved with these activities are CoTC holders, they are:

Jonathan Owens (DoB information in Appendix 1)

Andrew Clee (DoB information in Appendix 1)

5.3.5 Copies of their certificates are included in Appendix 5

5.3.6 Details of other waste activities are where they currently also have TCM responsibilities are detailed in Table 1 below.

Table 1 Details of Technical Persons and other waste activities TCM provided for

TCM	Permit Number	Site Address and Post Code
Jonathan Owens	EPR/EB363AK/A001 EAWML105284	Provectus Remediation Ltd Mobile Plant Eling Wharf
Andrew Clee	EPR/BS7722ID	3C Waste Limited Maw Green Landfill Site Maw Green Road Coppenhall Crewe Cheshire CW1 5NG

5.3.7 The Operator will also implement a number of site-specific procedures and documents to control the soil treatment operations at the site.

5.3.8 The Operators existing management procedures will be updated to include the activities proposed. In addition, the operator has implemented an environmental management system across the company to control the operations at their sites. A summary of the management system is included within document ref: 3982-CAU-XX-XX-RP-V-0301.

6 SUPPORTING INFORMATION

6.1 Part C2 – 5a: Plans for the site

6.1.1 No land will be added to the permitted areas a result of this variation.

6.2 Part C2 – 5b: Site report for any additional land

6.2.1 As no additional land will be added, however an addendum to the existing ESID Report has been included to cover the activities proposed and is referenced in the Site Condition Report document ref: 3982-CAU-XX-XX-RP-V-0304.

6.3 Part C2 – 5c: Non-technical summary

6.3.1 A non-technical summary has been provided as part of this application under document reference: 3982-CAU-XX-XX-RP-V-0302.

6.4 Part C3 – Table 1b: Types of waste

6.4.1 The waste types to be accepted within the soils treatment facility are detailed in Table 1 below.

Table 1a: Wastes to be accepted for physical treatment of waste

01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**
01 05	**drilling muds and other drilling wastes**
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing hazardous substances
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 05*	oil spills
05 01 15*	spent filter clays
13	**Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)**
13 05	**oil/water separator contents**
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing hazardous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 05*	construction materials containing asbestos
17 09	**other construction and demolition wastes**
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 04*	premixed wastes composed of at least one hazardous waste – wastes suitable for biological treatment only
19 02 05*	sludges from physico/chemical treatment containing hazardous substances – wastes suitable for biological treatment only
19 02 11*	other wastes containing hazardous substances – wastes suitable for biological treatment only
19 08	**wastes from waste water treatment plants not otherwise specified**

19 08 13*	sludges containing hazardous substances from other treatment of industrial waste water
19 13	**wastes from soil and groundwater remediation**
19 13 01*	solid wastes from soil remediation containing hazardous substances
19 13 03*	sludges from soil remediation containing hazardous substances

Table 1b: Wastes to be accepted for treatment in the bioremediation process

01	**Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals**
01 05	**Drilling muds and other wastes**
01 05 05*	Oil-containing drilling muds and wastes
01 05 06*	Drilling muds and other drilling wastes containing hazardous substances
05	**Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**
05 01	**wastes from petroleum refining**
05 01 05*	Oil spills
13	**Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)**
13 05	**Oil/water separator contents**
13 05 01*	Solids from grit chambers and oil/water separators
13 05 02*	Sludges from oil/water separators
13 05 03*	Interceptor sludges
13 05 08*	Mixtures of wastes from grit chambers and oil/water separators
17	**Construction and demolitions wastes (including excavated soil from contaminated sites)**
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing hazardous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**Wastes from physico/chemical treatment treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 04*	premixed wastes composed of at least one hazardous waste – wastes suitable for biological treatment only
19 02 05*	sludges from physico/chemical treatment containing hazardous substances – wastes suitable for biological treatment only
19 02 11*	other wastes containing hazardous substances – wastes suitable for biological treatment only
19 08	**wastes from waste water treatment plants not otherwise specified**

19 08 13*	Sludges containing hazardous substances from other treatment of industrial waste water
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 11*	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances
19 13	**Wastes from soil and groundwater remediation**
19 13 01*	Solid wastes from soil remediation containing hazardous substances
19 13 03*	Sludges from soil remediation containing hazardous substances
20	**Municipal Wastes (household waste and similar commercial, industrial and institutional wastes) Including separately collected fractions**
20 03	**Other municipal wastes**
20 03 03	Street cleaning residues

6.5 Part C3 – Appendix 4 – Specific Questions for the Landfill Sector

6.5.1 Provide your Environmental Setting and Installation Design (ESID) report: 3982-CAU-RP-V-0304-A0-C1.

6.5.2 Provide your Hydrogeological Risk Assessment (HRA) for the site: Not required for this application.

6.5.3 Provide your Stability Risk Assessment (SRA) for the site: Not required for this application.

6.5.4 Provide your Landfill Gas Risk Assessment: Not required for this application.

6.6 Part F1 –2: Payment

6.6.1 Based on GOV.UK website 'Environmental Permitting Charges Guidance', under Section 2.12 'Application charge for multiple activities under one permit', 50% of the relevant application charge for any secondary activities that can be reasonably be considered to be part of the same operation and a secondary activity can be calculated. 10% of the relevant charge for the same activity carried out multiple times on the same site can be calculated. The 10% charge is applied where a hazardous waste operation with associated storage of hazardous waste will be 10% of the relevant application charge. Therefore, the associated fees are as follows:

Ref	Activity	Cost
1.16.1.1	Sect 5.3(a)(i) haz waste, biological treatment	16,001 (100% of charge)
1.16.1.2	Sect 5.3(a)(ii) haz waste, physico-chemical treatment	8000.50 (50% of charge
1.16.2.1	Sect 5.4(a)(i) non-haz waste, biological treatment	6,992 (50% of charge)
1.16.4	Sect 5.6 temporary or underground storage of hazardous waste	1,600.10 (10% of charge)

Additional Assessment Charges		
1.19.2	Habitats Assessment	£779
1.19.5	Emissions Management Plan	£1,241
1.19.6	Odour Management Plan	£1,246
	Total	**35,859.60**

6.6.2 A BACS payment for the amount of £35,859.60 under remittance number **PSCAPPFCCDANES** been made to the EA to cover all associated fees.

Drawings

Appendix 1:

Relevant Persons DoB

Confidential

Appendix 2:

Environment Agency Pre-Application

Appendix 3:

Environmental Management System Summary

Appendix 4:

Competency Management System – Energy & Utility Skills (Private Standard) Version 4

Appendix 5:

TCM Certificates

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P04	RECEPTOR BOUNDARY INCREASED	EJD	KB	AS	25.11.19
P03	ISSUED FOR INFORMATION	EJD	KB	AS	14.11.19
REV	MODIFICATIONS	BY	CH	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: 1000m SENSITIVE RECEPTOR PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF	REVISION
04.11.2019	1:2500	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1800

Caulmert engineering environmental planning

WWW.CAULMERT.COM

Sarah Mills

From: Kellie Burston
Sent: 22 January 2021 08:25
To: PSC Land
Cc: James Cook; Jon Owens; Andy Stocks
Subject: FCC Daneshill Soils Treatment Facility: Substantial Permit Variation
Attachments: Part A.pdf; Part C2.pdf; Part C3.pdf; Part F.pdf; Daneshill Application Letter.pdf

To whom it may concern,

Please see attached the relevant application forms and application letter for the substantial variation permit application at Daneshill Soils Treatment Facility, below are document links for the relevant supporting documents. In addition, a payment for the amount of: **£35,859.60** under BACS reference: **PSCAPPFCCDANES** has been made to the EA.

Supporting Document
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:a35e530b-ea18-48a3-89c1-00685d82e964

Non-Technical Summary
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:297f3756-8987-4be7-8c97-e2d83f86825f

Amenity Risk Assessment
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:09ca2ba9-572b-44a8-b8bb-99bba892d530

BAT Report
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:1510edcf-a354-469c-9710-85a25a9223b0

ESID
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:ec46478c-acf6-431e-a048-804d8063d8bc

Emissions Management Plan
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:edf7f342-b709-4b0a-bf17-28bd659e8336

Odour Management Plan
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:4bda21ae-62fb-4fff-a0e3-3248163be3b4

Operational Techniques Report
- https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:62dbfe21-057a-478d-80fe-1f973ffea956

I trust everything is in order, however please do not hesitate to get in touch.

Kind Regards

Kellie

Caulmert

Kellie Burston | Caulmert Limited

Application Letter

22 January 2021

14 Farrington Way, Eastwood Link Business Park, Eastwood, Notts NG16 3BF
Tel: 01773 749132
Fax: 01773 746280
Email: kellieburston@caulmert.com
Web: www.caulmert.com

VIA EMAIL
The Environment Agency
Permitting Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Our ref: 3982-CAU-XX-XX-RP-V-0900-A0-C1 Daneshill

Date: 22nd January 2021

Dear Sir/Madam

Environmental Permit Substantial Variation Application: Daneshill Soil Treatment Facility
Environment Agency Application Ref: EA/EPR/NP3538MF/V008

On behalf of our client, FCC Recycling (UK) Limited, please find attached the Substantial Variation Permit application for the proposed Daneshill Soils Treatment Facility within the existing Daneshill Landfill Site.

A BACS payment for the amount of £35,859.60 under BACS reference number: **PSCAPPFCCDANES** has been made to the Environment Agency on 22/01/2021. In addition, the client seeks to apply for an abatement of the charges as they are considered excessive and disproportional for the amount of time it would reasonably take to determine an application of this nature.

I trust the application is in order but please contact me if you need any further information or have any queries regarding this.

Yours Sincerely

Kellie-Marie Pacifico Burston
Senior Environmental Consultant

On behalf of Caulmert Ltd

Caulmert Limited
Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG

Company Registered No. 06716319
Company Registered in Cardiff

Schedule 5 Notice Documents

Schedule 5 Notice

Notice of request for more information

The Environmental Permitting (England & Wales) Regulations 2016

Company Director

Ground Floor West
900 Pavilion Drive
Northampton Business Park
Northampton
NN4 7RG

Application number: EPR/NP3538MF/V009

The Environment Agency, in exercise of its powers under paragraph 4 of Part 1 of Schedule 5 of the above Regulations, requires you to provide the information detailed in the attached schedule. The information is required in order to determine your application for a permit duly made on 16/07/2021.

Send the information to either the email or postal address below by 01/10/2021. If we do not receive this information by the date specified then we may treat your application as having been withdrawn or it may be refused. If this happens you may lose your application fee.

Email address: psc@environment-agency.gov.uk.

Postal address:
Permitting and Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Name	Date
Katie Dunmore	06/08/2021

Authorised on behalf of the Environment Agency

Schedule

Site plan

1. Provide a revised site layout plan which shows the site infrastructure in greater detail. The plan must be labelled and to scale and show how the site has been designed to ensure segregation of hazardous and non-hazardous waste along with asbestos contaminated soils. As a minimum it must include:
   - waste stockpile locations – reception and sampling areas, treatment and post treatment storage
   - raw materials and fuels (including bunding)
   - key plant items such as the location of the screening plant and asbestos picking station (show conveyors with inputs both in and out)
   - asbestos storage skips
   - vehicle wheel wash
   - storage of mobile plant such as excavators
   - asbestos decontamination areas and control zones
   - equipment wash down areas
   - water treatment compound
   - biofilter

Drainage system

2. Provide a revised drainage plan which shows how waters falling onto the wider site are captured and channelled. Site surfacing must be labelled and the location of the vehicle wheel wash and equipment wash-down areas shown along with an explanation of how these waters are captured and contained. The plan must also show any surface water discharge points from the STF area.

3. Explain how the asbestos storage and treatment pad will be designed to ensure that surface waters falling on the pad will be retained and channelled to the collection sump.

4. Explain how water will be transferred from the collection sumps to the water treatment system. Include any pipework on the revised drainage plan.

5. Explain the containment measures provided for the water treatment compound, waste, raw materials and fuels storage areas. Include these on the revised plan.

6. Explain any additional precautions proposed when dealing with waters captured from the treatment pads including measures to prevent over pumping into the system.

7. Provide details of any additional measures in place to deal with waters captured from the asbestos treatment pad and asbestos wash down areas.

   Reason – the water treatment proposed involves adsorption and settlement. Measures which will capture hydrocarbon contaminants and settle out sediments. They however will not capture asbestos fibres. We are concerned any fibres present in surface waters will pass through the treatment plant and potentially be reused or enter the wider environment.

Asbestos Soil Treatment

8. Are asbestos contaminated soils expected to be contaminated with hydrocarbons or other contaminants. Once treated will these be directed to the bioremediation process?

9. Do you require code 17 05 04 to also be included for asbestos treatment?
   Reason – We consider soils contaminated with asbestos sheeting to be consigned under two waste codes, the base soil and separate asbestos sheeting. Provided waste acceptance confirms the fibre

- *Storage and treatment in enclosed buildings and/or equipment*
- *Maintaining enclosed equipment under adequate pressure*
- *Collecting and directing emissions to an adequate abatement system*

17. Provide details of the asbestos decontamination procedures in place for both staff and equipment.

    Reason – the measures described are not sufficiently detailed. You must explain the wet cleaning techniques used and how waters are captured etc. We would expect areas of the site dealing with asbestos contaminated materials to be clearly demarked, access restricted and clear techniques described for the decontamination of staff and equipment.

18. Clarify the post treatment sampling and testing undertaken on the asbestos soils. Explain how these samples are analysed and what thresholds dictate what happens next to the treated soils.

    Reason – Section 2.5.1 of the BAT assessment details testing is undertaken but provides no further clarification. Its noted table 5 of the STC compliance testing and sampling document details output compliance testing is the same for inputs but again this appears specific to the bioremediation process. You must explain the fibre sampling specific to the asbestos soils to ensure treatment and handing has not increased fibre concentrations.

19. Clarify the asbestos fibre monitoring proposed during soil screening activities. Explain if there are static monitoring points and if separate personal monitoring for staff is undertaken.

20. Clarify if all asbestos monitoring locations have been identified on plan 3982-CAU-XX-XX-DR-V-1803. Revise the plan if necessary.

    Reason – This plan details 4 boundary locations. Table 2 of the EMP confirms monitoring is also undertaken around the treatment area during screening. These locations must also be included.

Bioremediation

21. Clarify the arrangements for waste acceptance verification testing specifically the frequency of reception sampling. You must also demonstrate that the site has sufficient space to isolate loads whilst they wait for acceptance analysis.

    Reason – Table 1 of the BAT document copied from table 1 of the Provectus STC –FO03 details sampling at a different rate to Table 1 of the separate Waste Acceptance procedure STC document.

22. Explain if the same screening equipment is used for hazardous, non-hazardous and asbestos containing waste. Explain the procedures in place to ensure hazardous and non-hazardous wastes are stored and treated separately. Detail the operating techniques in place to avoid cross contamination.

    Reason – The cross-contamination and clean down procedures detailed in section 4.5 of the BAT document provide some discussion of the wet wash down procedures used to remove asbestos fibres when mobile machinery is removed from site. This however is not sufficiently detailed. You must provide clarification as to whether the same equipment is used for screening hazardous/non-hazardous and asbestos wastes, the decontamination procedures used and if its moved between working areas the measures to prevent cross contamination etc.

23. Provide details of the management procedures in place to prevent fugitive emissions (dust, VOC and odour) resulting from waste handling and biopile turning operations. Include information on how additives are applied to the biopiles and how long biopiles are likely to remain open.

    Reason – You must demonstrate the measures in place meat BAT5. Waste handling techniques have not been adequately described. For example the soil turnover procedure details how this is undertaken but not how emissions are minimised. These techniques must also be clearly detailed in the EMP. See below for further clarification.

32. Provide details of how asbestos fibres will be captured and contained.

Emissions Management Plan

33. The document must be revised to remove reference to a waste treatment building which has been referenced several times as mitigation for screening and hand picking.

34. A site layout plan must be included within the EMP. This must be drawn to scale and include all detail as stated in the site layout request above along with visuals of suppression equipment such as nozzle heads and the spray arcs they reach.

35. Provide details of the wheel wash. Is this a specifically designed wash of a jet washing area? Explain how waters are contained and disposed of. Explain what measures are in place to ensure the wheel wash has done its job.

36. Describe how the site infrastructure is designed to prevent dust and particulate emissions from leaving the site boundary.

Reason – The EMP does not provide any detail as to the passive pollution prevention measures in place. You must detail all measures in place through each activity. Include stockpile heights, storage bays, freeboard, stockpile orientation etc. Link to the revised site plan as requested above.

37. Considering the above the EMP must be revised to include a detailed source pathway receptor table which identifies the mitigation measures to reduce the pathway to receptors.

Reason – The measures provided in the plan do not detail the infrastructure standards or waste handling measures expected. Section 4.2.2 identifies a number pf potential emissions sources which are then not expanded upon in section 6. Remove reference to the construction phase of the project. We are concerned with emissions from waste handling and treatment operations only.

38. Provide details of the water based suppression system in more detail including:
- Which stockpiles have water sprinklers (show these on the site plan)
- If suppression is provided within the picking booth (6.1.23 indicates this but no further detail is provided)
- Explain if the sprinkler on the screener is fixed into position or mobile
- Explain if the stockpile sprinklers are fixed into position
- Explain if they are fed from water storage or mains
- Demonstrate there is sufficient supply and pressure to provide water to all the sprinklers and cannons as necessary

If treated water from the site treatment system is to be used what is the testing criteria to ensure the water is suitable for use and will not result in contamination of the site.

Reason: The Emissions Management Plan makes reference to water suppression when handling asbestos contaminated soils and screening soils. We however would anticipate suppression to be in place for all soil handling operations and when screening hazardous and non-hazardous (non-asbestos soils) this should be made clear.

39. Provide details of the management procedures for fugitive emissions of (VOC, odour) resulting from waste handling, screening and biopile turning operations. How long are biopiles likely to remain open?

Reason – You must demonstrate measures in place meet the requirements of BAT 5. Waste handling measures have not been adequately described for example the soil turnover procedure details how this is undertaken but not how emissions are minimised.

Schedule 5 Response

Caulmert
engineering environmental planning

Nottingham Office, Strelley Hall, Strelley, Main Street, Nottingham, NG8 6PE
Tel: [redacted]
Email: [redacted]
Web: www.caulmert.com

Permitting and Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
S9 4WF

Our ref: 3982-CAU-XX-XX-CO-V-9001-A0.C1
Your ref: EPR/NP3538MF/V009

1st October 2021

By e-mail

F.A.O. *Katie Dunmore, Permitting Officer*

Dear Katie

Re: *Schedule 5 notice for Daneshill Soils Treatment Facility (permit ref: EPR/NP3538MF/V009)*

I am writing on behalf of FCC Recycling (UK) Limited regarding the Schedule 5 notice issued for the permit variation application for Daneshill Soils Treatment Facility. Please see below our responses to your Schedule 5 and the attached relevant and updated documents to support our response.

1) Site Plan

Provide a revised site layout plan which shows the site infrastructure in great detail. The plan must be labelled and to scale and show how the site has been designed to ensure segregation of hazardous and non-hazardous waste along with asbestos contaminated soils. As a minimum it must include:

- *Waste stockpile locations*
- *Raw materials and fuels (including bunding)*
- *Key plant items such as screening plant and asbestos picking station (show how conveyors with inputs both in and out)*
- *Asbestos storage skips*
- *Vehicle wheel wash*
- *Storage of mobile plant such as excavators*
- *Asbestos decontamination areas and control zones*
- *Equipment wash down areas*
- *Water treatment compound*
- *Biofilter*

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1807 'Soils Treatment Pads; 1,2 and 3 Site Layout Plan'

Drainage

2) ***Provide a revised drainage plan which shows how waters falling onto the wider site are captured and channelled. Site surfacing must be labelled and the location of the vehicle wheel wash and equipment wash-down areas shown along with an explanation of how these water are captured and contained. The plan must show any surface water discharge points from the STF area.***

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1808 'Surface and Foul Water Locations'

3) ***Explain how the asbestos storage and treatment pad will be designed to ensure that surface water falling on the pad will be retained and channelled to the collection sump.***

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1808 'Surface and Foul Water Locations'.

Treatment pads are designed to have a fall towards a main water collection drain to ensure that water is continually drained from the pads and directed towards a centralised pumping chamber for transfer to the water treatment system. Water is unable to leave the downgradient periphery of the pads by lateral flow due to the presence of a containment bund of 300mm height. Water is unable to migrate to underlying controlled waters due to the presence of an engineered pad with a geosynthetic clay liner that would have a design permeability of 1 x 10-9m/s as a minimum.

4) ***Explain how water will be transferred from the collection sumps to the water treatment system. Include any pipework on the revised drainage plan.***

Water will be transferred using a pump with integral level detection sensors from the collection sumps to the water storage tanks. Pipework connecting the pumping chamber to the primary collection tank will be HDPE pipework connected by butt fusion. The pipework will be commissioned, and pressure tested prior to operation to ensure that no leaks are present.

5) ***Explain the containment measures provided for the water treatment compound, waste, raw materials and fuel storage areas. Include these on the revised plan***

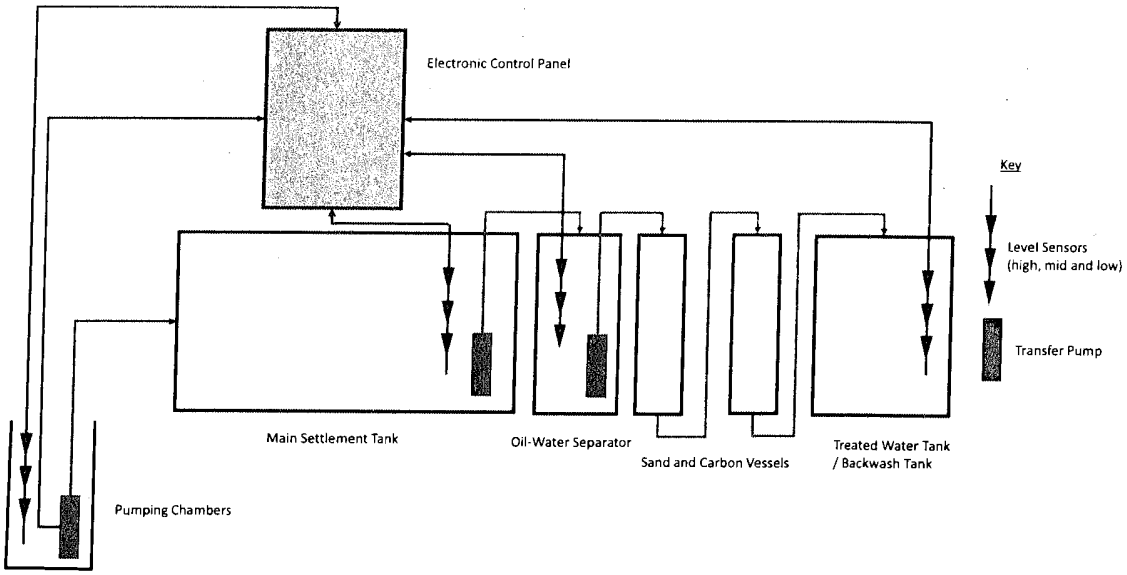
Water Treatment Compound – waste, raw materials and fuel storage areas as shown in drawing ref: 3982-CAU-XX-XX-DR-V-1809.

6) ***Explain any additional precautions proposed when dealing with water captured from the treatment pads including measures to prevent over pumping into the system.***

Waters captured from the treatment areas are pumped from the pumping chambers into the main water settlement tank. A schematic is shown in Figure 1 below.

The pumping system controls all the transfer pumps. The level sensors protect the pumps and protect from overfilling. The high level prevents further pumping into the receiving vessel. The mid-level activates the transfer pump. The low-level sensor prevents the water level from being below the level of the transfer pump.

Figure 1. Water Treatment Schematic



The main water settlement tank is installed with low level, mid-level and high-level sensors. If the high-level sensor is activated the control panel will prevent further pumping from the treatment areas into the main settlement tank. The mid and high-level sensors operate the settlement tank pump which transfers water through the sand and carbon filtration tanks to the treated water tank. The transfer pump in the main settlement tank will continue to pump until the water level reaches the low-level water sensor. However, if any of the high-level water sensors are activated the control panel will prevent further water to be pumped into the vessel.

The pumps in the collection sumps cannot pump water until water levels in the main settlement tank are below the high level. When the water level reaches the mid-level sensor the pump shuts down.

In addition to the level sensor protection of the tanks, there is a bund surrounding the water treatment system that also provides over pumping protection.

7) Provide details of any additional measures in place to deal with water captured from the asbestos treatment pad.

(reason – the water treatment proposed involves adsorption and settlement. Measure which will capture hydrocarbon contaminants and settle out sediments. They will however will not capture asbestos fibres. We are concerned any fibres present in surface water will past through the treatment plant and potentially be reused or enter the wider environment).

Asbestos is only accepted in a bound form. This means that it is encapsulated in a cement matrix as well as being present in soil. The presence of a bound matrix and soil has previously been expected to prevent the release of asbestos fibres into soil porewater. Fibre concentrations in soil are generally non-detect or below the detection limit of <0.001% in received soils. Water monitoring from asbestos process areas has not detected asbestos fibres to be present in effluent from asbestos processing areas. Therefore, no abatement of asbestos in effluent is required. (Appendix A for asbestos testing of water)

Questions 8 – 20 refer to asbestos soil treatment and some responses will need to be deferred until agreement is reached with Chris Hall, Richard Hadley and Clive Wall on the pre-operation condition relating to asbestos treatment at a site operated under permit reference EPR/HP3632RP. It is anticipated that this agreement will be achieved imminently (subject to further data collection).

Asbestos Soil Treatment

8) ***Are asbestos contaminated soils expected to be contaminated with hydrocarbons or other contaminants. Once treated will these be directed to the bioremediation process?***

A low proportion of soils with asbestos accepted at our other facility are also impacted with hydrocarbons. Approximately 15% of inputs into our other permitted facility also contained hydrocarbons above 0.1%. These soils were all sent to the biotreatment area at the end of the asbestos treatment phase and validation testing to confirm that asbestos fibres could not be liberated from soils above the permit control limits for airborne emissions or >0.0005f/ml.

9) ***Do you require code 17 05 04 to also be included for asbestos treatment?***

(reason – we consider soils contaminated with asbestos sheeting to be consigned under two waste codes, the base soil and separate asbestos sheeting. Provided waste acceptance confirms the fibre count to be below 0.1% and the material does not contain other hazardous components the separate non-hazardous code may be required)

At our other facility the hazardous waste consignment note contains 17 06 05 and 17 05 04 for asbestos inclusions in non-hazardous soil. The Operator are only treating the hazardous substances in this consignment.

10) ***Explain what compliance sampling and testing is undertaken prior to asbestos soil being accepted on site. This must include the parameters sampled and the parameters used. Please also confirm the frequency of testing. You must demonstrate your pre-acceptance cand acceptance procedures and testing can accurately identify the type and quantity of fibres present.***

(reason – Its noted Section 2.2.2 of the Emissions Management Plan and other documents confirm waste will be accepted subject to satisfactory pre-acceptance checks and this is carried out to confirm free asbestos fibres are not above 0.1% for chrysotile asbestos and 0.01% for other forms. You must demonstrate how your procedures and testing can accurately identify the type and quantify of fibres present.

It is not clear if the Waste Acceptance Procedures provided with the BAT document also cover the acceptance of asbestos soils. It appears to be geared to the bioremediation process. You must provide full details of the acceptance criteria for asbestos contaminated soils)

The waste acceptance procedure has been updated in Appendix B (attached) to include asbestos as this was included separately in our operations manual.

11) ***Your waste acceptance procedures must be revised to explain how asbestos soils will be received and deposited into the quarantine and storage areas in a way that minimises dust emissions. You must also include details of the maximum quantity of waste stored at any one time for soils whilst awaiting treatment and post treatment.***

(reason – Limited information has been provided regarding the measures in place to minimise emissions when handling soils. It's not clear if waste is stored in bay or mound. As detailed within our guidance storage areas should be clearly marked and signed. All bays or locations containing asbestos should be labelled and turnover periods for all waste stored prior and post asbestos picking activity detailed. You must also provide stockpile dimensions.

All soils with ACM are covered awaiting reception testing and soil treatment. The maximum storage amounts are included in the drawings from Question 3.

Soils are received on the treatment pad and sampled into discrete lots based upon the site of origin. Whilst the moisture content of soils with ACM is rarely low and previous experience demonstrates that asbestos emissions from soils have never been measured above 0.0005f/ml, the dust suppression system is employed and soils are covered by the end of the working day with tarpaulins to ensure that soils are suitably contained prior to the formal

reception analysis results being received. Once the results confirm that the waste acceptance criteria are achieved, then the soils will be uncovered and proceed to the soil treatment phase. The maximum quantity of soils awaiting treatment on pads 1 and 2 is 2,880t on each pad, and Pad 3 is 3,840t. Once the soils are treated, they no longer pose a risk to human health from asbestos emissions; these soils either move to the soil storage area awaiting reuse in the restoration scheme or are placed immediately into biotreatment should elevated TPH concentrations remain present that are either hazardous or above the restoration criteria. All emissions management as part of the biotreatment works will be undertaken as described in other sections.

12) ***Explain how asbestos soils are processed through the three way screen in a way that eliminates asbestos fibre release from the soil and asbestos fragments as they pass through the screen. You must detail all proposed abatement techniques and demonstrate how this meets BAT 14 with regards to the containment, collection and treatment of diffuse emissions.***

Soil screening and hand picking on mobile treatment licensed projects have always resulted in asbestos emissions being monitored below <0.01f/ml. The historic hand-picking operation undertaken at Edwin Richards Quarry has always been monitored to be below <0.01f/ml or where testing has been undertaken to lower detection limits, they have always been below <0.0005f/ml. The containment measures for the soil screener have been proposed to the permitting and compliance team (including Chris Hall) for agreement. Once the performance data for this containment system has been collected it will be sent at a later date for review.

13) ***Provide details of the measures in place to prevent dust and asbestos fibre emissions when loading asbestos waste onto the picking line. Is the conveyor covered?***

There is a spray rail on the conveyor loading the picking station. The conveyor is uncovered but within the areas subject to secondary dust suppression via surfactant and water misting systems. Air sampling on the conveyors of the picking station (without dust suppression) has always resulted in monitored concentrations <0.0005f/ml or <0.01f/ml depending on the sampling and analysis method chosen. A recent example of the monitoring of the picking station hopper and conveyors over 5 subsequent days without dust suppression is shown in Appendix D (attached).

14) ***Provide details of how waste soil following picking will be transferred to the post treatment storage location which minimises dust and fibre emissions.***

The treated soil once validated to meet the requirements for reuse in restoration areas does not pose an asbestos emissions risk. Normal dust mitigation will be applied if visual dust is occurring around the site in accordance with the measures highlighted later in this response for queries about fugitive dust emissions and suppression. If elevated hydrocarbons are present, then the soil will be transferred to the biotreatment area and formed to a biopile with the active vacuum system applied.

15) ***Explain the procedure in place for dealing with picked asbestos fragments. Are they double bagged on the picking line? How are the bagged pieces deposited within the skip?***

All asbestos removed from soil is removed from the picking station conveyor by the asbestos operatives, then placed into asbestos bags before being double bagged in the appropriate asbestos bag and sealed. Double bagged asbestos debris is placed in a dedicated lockable asbestos skip by the asbestos operative. Once the asbestos skip is full it is consigned as hazardous waste to an appropriately permitted landfill.

16) ***Explain if there is an emissions abatement in the picking booth. If not explain how airborne fibre emissions are captured and contained.***
(reason – we have significant concerns that the asbestos soil storage, transfer and treatment activities as described do not meet BAT. There appears to be no specific mitigation or abatement proposed with stockpiles described as being deposited, screen and transferred to a picking station with door and windows, via conveyor and then further in open stockpiles.

The Emissions Management Plan states "asbestos fibres are not generate on site above the detection limit so no abatement system is required". We disagree, screening and dropping from height will agitate and may break asbestos materials and lead to release of fibres. Dust suppression and "wetting solution" alone is not considered sufficient mitigation. You must demonstrate through detailed working procedures how asbestos soils are stored, treated and handled to ensure the containment and collection of diffuse emissions. As stated in BAT we would expect techniques such as;

- *Storage and treatment in enclosed buildings and/or equipment*
- *Maintaining enclosed equipment under adequate pressure*
- *Collection and direction emissions to an adequate abatement system*

Further details of the approach proposed to Chris Hall, Richard Hadley and Clive Wall that meet the principles of BAT as well as guidance document: Chemical Waste: Appropriate Measures for Permitted Sites, November 2020 will be forwarded once agreed for implementation at Edwin Richards Quarry under the permit pre-operation condition. The measures are designed to meet WHO air quality guidance levels for asbestos of <0.0005f/ml rather than the expected permit target of <0.01f/ml.

17) ***Provide details of the asbestos decontamination procedures in place for both staff and equipment.***
Reason – the measures described are not sufficiently detailed. You must explain the wet cleaning techniques used and how waters are captured etc. We would expect areas of the site dealing with asbestos contaminated materials to be clearly demarked, access restricted and clear techniques described for the decontamination of staff and equipment.

The decontamination provisions for the asbestos area are implemented in our other site and are appropriate with the provisions for notifiable works and include the following:

- Access restrictions to asbestos treatment areas;
- Provision of clean and dirty areas within a dedicated decontamination unit;
- Disposal area for used overalls and masks/overshoes/cleaning materials etc for bagging and subsequent disposal as asbestos waste;
- Contained washing provisions for personnel decontamination prior to leaving the clean area of the decontamination unit;
- Decontamination of plant is undertaken under the supervision of a Category B trained person. Any visible contamination is removed manually, then plant is wet cleaned externally. Cabins will be vacuumed with a H Class vacuum cleaner and all debris/cleaning materials will be bagged and placed in the locked asbestos skip. A clearance air test within the any internal operator's cabins would require undertaking prior to leaving the working area. This approach meets the standards described in the HSE NI document attached in Appendix E.

18) ***Clarify the post treatment sampling and testing undertaken on the asbestos soils. Explain how these samples are analysed and what thresholds dictate what happens next to the treated soils.***

Reason – Section 2.5.1 of the BAT assessment details testing is undertaken but provides no further clarification. Its noted table 5 of the STC compliance testing and sampling document details output compliance testing is the same for inputs but again this appears specific to the bioremediation process. You must explain the fibre sampling specific to the asbestos soils to ensure treatment and handing has not increased fibre concentrations.

The work instruction on soil analysis STC WI006 Ver 4 is included in Appendix F. This provides the analysis suite for soil batches that are being validated for reuse. The sampling frequency used is 1/500t. The reason for this is that the soils that are treated at the site are from a number of sources and once reception sampling is completed these are combined into batches to form a heterogenous stockpile. Treatment is undertaken on the biopiles, and batch size can vary significantly with over 10,000t occasionally being tested for disposal as treatment is deemed completed when all samples in a batch meet the reuse criteria.

The asbestos treatment has more in common with a continuous process that is sampled on a 1/500t frequency. The reason why this sampling frequency is chosen is that it meets the general principles contained within EA guidance document 'dispose of waste to landfill' April 2021 (https://www.gov.uk/guidance/dispose-of-waste-to-landfill).

Due to the need to undertake a restoration risk assessment to identify suitable targets to protect controlled waters receptors and human health at the site the exact chemical suite and form of testing is subject to change. The site-specific risk assessment for the restoration area where treated soils are to be reused, including appropriate soil treatment targets is to be completed and agreed with the Environment Agency prior to the use of treated soils at the site.

19) ***Clarify the asbestos fibre monitoring proposed during soil screening activities. Explain if there are static monitoring points and if separate personal monitoring for staff is undertaken.***

The asbestos monitoring is undertaken at the boundary locations specified. In addition, more frequent monitoring is undertaken at the source area during soil treatment works. The use of personnel asbestos monitoring was historically undertaken at another site with the same operator; however, there is no risk of the control limit being exceeded during soil treatment, and the detection limit is not sufficiently sensitive to meet our internal criteria due to the relatively low volume of air that can be practically sampled by equipment attached to an individual. Personnel monitoring has therefore been discontinued in preference to more frequent monitoring at the soil treatment location using sampling equipment operated for sufficient time to achieve a detection limit of <0.0005f/ml.

A drawing is included to include the sampling points around the soil treatment equipment will be shown on the drawing from question 3). This will be located immediately downwind of the treatment plant, so from day to day may slightly change from the location highlighted on the drawing.

20) ***Clarify if all asbestos monitoring locations have been identified on plan 3982-CAU-XX-XX-DR-V-1803. Revise the plan if necessary.***

Reason – This plan details 4 boundary locations. Table 2 of the EMP confirms monitoring is also undertaken around the treatment area during screening. These locations must also be included.

In addition to drawing ref: 3982-CAU-XX-XX-DR-V-1803, Emissions Monitoring Plan for Dust Asbestos and VOCs, Drawing ref: 3982-CAU-XX-XX-DR-V-1812 shows sampling locations positioned to act as source area sampling points; it is to be noted that several sampling points will be pooled to form an individual sample due to the high volume of air (typically 1,440l) required to achieve the asbestos detection limit of <0.0005f/ml.

Bioremediation

21) ***Clarify the arrangements for waste acceptance verification testing specifically the frequency of reception sampling. You must also demonstrate that the site has sufficient space to isolate loads whilst they wait for acceptance analysis.***

Reason – Table 1 of the BAT document copied from table 1 of the Provectus STC –FO03 details sampling at a different rate to Table 1 of the separate Waste Acceptance procedure STC document.

The annual capacity for hazardous waste is c. 30,000t over 52 weeks. The treatment areas combined, have a surface area 11,830m2. If 30,000t of soil was in treatment at any one time, it would require only 6,250m2 of treatment area (53% of the total) assuming an average stockpile/biopile height of 3.0m and dry density of 1.6t/m3. Therefore, the treatment areas are significantly oversized to allow for all inputs to be subject to reception testing prior to formal acceptance.

The STC FO03 document originally submitted has now been aligned to waste acceptance procedure reference document: STC – WI 003 – Soil Characterisation Procedure rev 7 dated September 2021 and has the same sampling criteria.

Table 1: Requirements for sampling:

Volume of soil (t)	No. of samples needed (before or during acceptance at STC)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

22) ***Explain if the same screening equipment is used for hazardous, non-hazardous and asbestos containing waste. Explain the procedures in place to ensure hazardous and non-hazardous wastes are stored and treated separately. Detail the operating techniques in place to avoid cross contamination.***

Reason – The cross-contamination and clean down procedures detailed in section 4.5 of the BAT document provide some discussion of the wet wash down procedures used to remove asbestos fibres when mobile machinery is removed from site. This however is not sufficiently detailed. You must provide clarification as to whether the same equipment is used for screening hazardous/non-hazardous and asbestos wastes, the decontamination procedures used and if its moved between working areas the measures to prevent cross contamination etc.

The Operator can confirm that the same screening equipment is not used for different waste types.

The three-way soil screener for asbestos contaminated soils will be kept separate from other waste types and so no cross contamination will occur. Swab samples will be taken prior to this soil screening plant leaving treatment areas as previously stated. Due to the bound nature of

ACM debris and the general absence of quantifiable asbestos fibres cross contamination of the screener has never been shown to occur.

The only other soil screening that will take place on site is for non-hazardous treated soils from the biotreatment area and this will be undertaken using a separate two-way screen to enable the material to meet the physical criteria for restoration soils.
There will be no soil screening of hydrocarbon contaminated soils prior to biotreatment.

23) Provide details of the management procedures in place to prevent fugitive emissions (dust, VOC and odour) resulting from waste handling and biopile turning operations. Include information on how additives are applied to the biopiles and how long biopiles are likely to remain open.

Reason – You must demonstrate the measures in place meat BAT5. Waste handling techniques have not been adequately described. For example the soil turnover procedure details how this is undertaken but not how emissions are minimised. These techniques must also be clearly detailed in the EMP. See below for further clarification.

The Emissions Management Plan has been updated to reflect these techniques, Please See Section 7 'Control Measures'.
Fugitive emissions from biopile activities are extremely limited with the only measurable emissions generally occurring during the initial reception of soils from tipper lorries.

Table 2. Dust, VOCs and Odour Mitigation

Parameter	Mitigation
Dust	Soils are formed into 3-4m high biopiles with sealed sides. Turning is undertaken once every 3-4 weeks only for decompaction reasons and so overall soil movements are very limited. Soils in treatment have hydrocarbons converted to carbon dioxide and water. Increasing water content within soils during treatment has been shown to prevent dust emissions. Treated water can be used to irrigate dry soils at surface for dust suppression during prolonged dry and windy weather
VOCs and Odour	Site visits are undertaken prior to soils being accepted to ensure odours are not significant during soil reception. Daily cover of soil may be required for occasional loads of odorous soil The vacuum applied to soils shortly after receipt has been demonstrated to significantly mitigate odour release with 2-3 air exchanges in soil per hour. The biofilter is used continuously for soil gas effluents No turning of soils is undertaken until soil gas samples indicate low levels of total VOCs – typically <40ppm total VOCs

24) Provide details of the storage location, maximum storage time, volume and pile size of each waste material stored for use in the biopiles and biofilter - 17 02 01 - wood, 19 05 03 – off specification compost, 19 12 07 – wood and 20 03 03 – leaf litter. These locations must be labelled on the site plan. You must demonstrate there are appropriate procedures in pace for the storage of these combustible wastes.

We may require you to produce a Fire Prevention Plan in line with our Guidance Link. An additional fee may be required.

Describe how each individual waste detailed above will benefit the remediation process. Clearly explain what it is, why it is added and provide a demonstration that the waste is necessary for treatment. You must explain the waste acceptance procedures to ensure the waste are suitable for the process and will not add further contaminants which may negatively impact the bioremediation process.

Provide details of the mixing ratios for all raw materials, both waste and non-waste
Reason – It's noted there is some description provided regarding the use of leaf litter.
Its noted woodchip will be added to clayey soils and stored in an articulated lorry. This however is not sufficient detail to assess the fire risk and detail remains patchy. No discussion has been provided regarding the use of off specification compost which is derived from municipal waste and highly variable in nature.

A maximum of 30m^3 of waste wood will be stored in a designated area on site for use in the biopiles. Leaf litter is accepted as incidental inclusions within soil and so will not be stored separately. The locations are shown on the detailed biopile layout drawing from question 1.

The biofilter will be formed of off-specification compost and approximately 1-2% of treated soil to provide a suitable inoculum for hydrocarbon competent microflora.

25) ***What are the treatment standards you are aiming to achieve by bioremediation for both hazardous and non-hazardous waste? At what concentration levels are the wastes considered treated?***

Reason – BAT is to set up and implement and output quality management system that ensures that the output of the treatment is in line with expectations and objectives prior to treatment. It's noted the objective of treatment is to provide a material suitable for restoration of the landfill and use within the access road. The quality standards aimed for however are not clear.

The waste is considered treated when it achieves:

- a non-hazardous concentration in accordance with an assessment of residual substances in accordance with WM3 (v1.1GB Jan 2021);
- contaminants meet the targets identified in a human health risk assessment and detailed quantitative risk assessment for controlled waters. This risk assessment is to be completed for the restoration areas of the site to ensure that any residual soil impact does not pose a risk to identified receptors at the site. No soil will be reused in the restoration/void areas until the proposed soil contaminant targets highlighted in this risk assessment is agreed.

26) ***Explain what contaminants are expected to be in the following wastes;***
EWC 05 01 15* spent filter clays, 17 09 03* Hazardous C&D waste and 17 09 04 Non-hazardous C&D. Explain how they will be treated and why this will render them suitable for reuse on site. Explain the sampling and testing proposed.

EWC codes 05 01 15, 17 09 03 and 17 09 04 can be removed. 17 09 03 and 17 09 04 were included due to a local enforcement officer facility insisting on another site that this would be required – but this was subsequently confirmed as not being required. 05 01 15 is not required due to the limited volumes available for treatment locally.

27) ***Clarify the biofilter monitoring proposed. Explain the parameters and the frequencies chosen.***

Reason - Provectus report STC – WI 007 states the biofilter will be monitored monthly through a lab for VOC, Spectated PAH and TPH plus bimonthly onsite sampling using a PID. This information however has not been replicated in Table 2 within the Emissions Management Plan which states biofilter monitoring will be 6 monthly for Ammonia, TVOC and Hydrogen Sulphide please confirm.

The biofilter monitoring proposed is:

Table 3. Biofilter Monitoring

Parameters	Unit	Detection limit	Action trigger limit
BTEX	mg/m^3	0.05	
TPH	mg/m^3	0.05	
Top 16 PAH	mg/m^3	0.05	
Moisture content	%		<60 or >80
Grain size	mm		<10 or >25
Total N*	mg/kg		<400
Total P**	mg/kg		<150
pH			<6.5 or >8.5

Mitigation Measures

The following actions are provided for parameters being out of optimal range:

- BTEX/TPH/PAHs elevated – reduce airflow and investigate moisture content/grain size/total N and P and pH
- Reduced moisture content – irrigate biopile
- Elevated moisture content – remove tarpaulin and turn pile
- Grain size <10mm – replace biofilter matrix
- Total N <400mg/kg and Total P <150mg/kg – add nutrients
- pH <6.5 or >8.5 – replace biofilter matrix

28) ***Clarify the process monitoring proposed for the biopiles.***

Reason - its noted pH, temperature, moisture content, Oxygen level and nutrient concentrations are monitored, please confirm how often.

The biopile monitoring undertaken is as follows:

Table 4. Biopile Monitoring

Parameter	Frequency	Reason
pH	Monthly or as required during soil turnovers	To ensure that the pH stays between 5-9
Temperature	Weekly	An indirect indicator of microbial respiration
Moisture content	Monthly or as required during soil turnovers	To identify if soils are waterlogged or have the potential for dust during a turnover
Oxygen levels	Weekly	To identify
Available Nitrogen	Fortnightly per batch	To ensure the presence of sufficient available nitrogen to support mineralisation of hydrocarbons
Vacuum pressure	Continuously	To ensure that oxygen levels in soil are always optimal at >10%. To provide continuous capture of any VOCs extracted from soil and treatment by biofilter to prevent fugitive emissions as far as practical
Soil contaminants	Monthly or as required during soil turnovers	To monitor when soils are suitable for use in the restoration scheme for the landfill

Water treatment system

29) Clarify what measures are in place to ensure the water treatment plants efficiency. Provide details of monitoring, measures to prevent over pumping into the system, alarms etc.

The water treatment system is inspected every week to ensure that each of the unit operations are working effectively.

This will ensure that the level sensors operate effectively at different water levels, high level alarms are activated correctly, pumps are working and operating within their normal range and pressure readings in vessels are within their normal operating range.

Further details of the water treatment plant set up are contained within response 6).

Should pressure readings be elevated, then treated water will be initially backwashed through the sand and carbon vessels to decompact sand and granular carbon within the filters. The pressure readings will then be monitored as water is then passed through the vessels into the treated water tank. If these remain elevated, then the sand and carbon will be replaced.

Sampling points are contained within the sand and carbon vessels to allow for samples to be obtained. Sampling the carbon vessel at different levels allows for early indicators that the carbon requires replacing prior to any breakthrough of contaminants into the treated water tank.

30) What are the size of the storage tanks? How do you know this is sufficient to contain runoff from the treatment pads?

A flood risk assessment has been conducted as part of the planning process. This requires a storage capacity for a 1 In 100 yr. storm + 40% CC to be 1,588m3 for all the treatment pads.

The treatment pads are made up of a lined area overlain with a 0.5m thickness of crushed concrete. With an average porosity of 30% this will provide a retention of 1,425m^3. There will also be a peripheral bund of minimum 0.3m depth that will provide up to an additional 532m^3

to 1,775m³ of flood retention depending on soil coverage so in total a storage capacity of 1,957m³ to 3,200m³ of water storage capacity, so well in excess of the storage capacity recommended by the flood risk assessment.
A 50m³ storage tank will be used for primary settlement, this is sized to provide sufficient settlement capacity for the effluent flow rates (generally ~2-4m3/hr) prior to treatment for off-site disposal.

31) Provide the design details of the tanks including pipework and containment.

The design details are shown on the drawing attached (to follow). The largest tank in the water treatment area is 50m³ and so would require a minimum of 55m³ of bunded capacity. The pipework between tanks comprises of 50mm fusion welded HDPE to ensure the highest possible leak protection.
The bund has a capacity of approximately 82.5m³ will be constructed in accordance with CIRIA document: Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises' (C736D; 2014).

32) Provide details of how asbestos fibres will be captured and contained.

Monitoring of the existing effluent from asbestos treatment areas has revealed that asbestos fibres are absent (examples of data in Appendix A). This is due to the acceptance of bound asbestos only and the absence of mobile asbestos fibres that could enter the water treatment system.

Asbestos monitoring will be continued to be undertaken on each batch of water that requires disposal to ensure the correct waste description is provided to any liquid effluent disposal contractor and that there is no cross contamination of the receiving disposal facility for the treated water.

Emissions Management Plan

33) The document must be revised to remove reference to a waste treatment building which has been referenced several times as mitigation for screening and hand picking.

References to a waste treatment building has been removed- please see attached revised Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.A0.C2.

34) A site layout plan must be included within the EMP. This must be drawn to scale and include all detail as stated in the site layout request above along with visuals of suppression equipment such as nozzle heads and the spray arcs they reach.

Please see attached revised Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.A0.C2. Updated drawings include: 'Suppression Systems Location'
Drawing ref: 3982-CAU-XX-XX-DR-V-1810 and 'Suppression System Spray Arcs', Drawing ref: 3982-CAU-XX-XX-DR-V-1811.

35) Provide details of the wheel wash. Is this a specifically designed wash of a jet washing area? Explain how waters are contained and disposed of. Explain what measures are in place to ensure the wheel wash has done its job.

Wheel washing on site will be provided by a heavy duty wheel wash and comprise of a high pressure washing system over rumble strips. Water will be recycled with primary settlement in a closed loop system. Any sediment removed from the wheel wash will be tested and treated prior to reuse as appropriate in order to meet the site specific risk assessment for the restoration area.

Prior to the tipper lorry leaving site or entering the wheel wash the tyres and external areas will be inspected to ensure that there are no residual contamination or significant solids on the wheels that could cause drag out onto the public highway. Once this check is undertaken the completed consignment note is returned to the driver.

36) ***Describe how the site infrastructure is designed to prevent dust and particulate emissions from leaving the site boundary.***
Reason – The EMP does not provide any detail as to the passive pollution prevention measures in place. You must detail all measures in place through each activity. Include stockpile heights, storage bays, freeboard, stockpile orientation etc. Link to the revised site plan as requested above.
A number of aspects of the site infrastructure and procedures on site are designed to mitigate dust emissions.

Biotreatment

- Soils are received and sampled and then placed onto the vacuum system which will capture emissions whilst the initial soil testing is completed.
- Screening of contaminated soils is not required prior to biotreatment
- Soils are formed within their initial reception area into biopiles, and the surfaces sealed using an excavator bucket.
- The use of a static biopile reduces the amount of soil management to a minimum. In a typical treatment period, the soils are turned over twice.
- The mineralization of hydrocarbons results in elevated moisture content in soils reducing the potential for dust emissions
- The biopiles can be irrigated as a mitigation measure should surface dust be observed, albeit this is rarely required.

Asbestos

- Waste acceptance for soils with asbestos inclusions are limited to bound pieces and strict asbestos fibre limits that have been shown to not release airborne asbestos fibres above WHO air quality guidance levels of <0.0005f/ml
- Covering asbestos contaminated soils awaiting treatment with tarpaulins will prevent fugitive emissions
- Use of surfactant-water misting system in operational areas where there is the potential for uncovered soil processing works has been shown to supress dust and ensure that airborne asbestos monitoring below <0.0005f/ml
- The general stockpile orientation of west to east is generally parallel to prevailing wind direction
- The site is surrounded by woodland resulting in a more sheltered and less exposed position than other potential sites within the Daneshill waste management facility.

The EMP has been updated with the source pathway receptor table and the detail above included.

37) ***Considering the above, the EMP must be revised to include a detailed source pathway receptor table which identifies the mitigation measures to reduce the pathway to receptors.***
Reason – The measures provided in the plan do not detail the infrastructure standards or waste handling measures expected. Section 4.2.2 identifies a number of potential emissions sources which are then not expanded upon in section 6. Remove reference to the construction phase of

the project. We are concerned with emissions from waste handling and treatment operations only.
Please see revised Emissions Management Plan which has been updated with the source pathway receptor table.

38) Provide details of the water based suppression system in more detail including:

- ***Which stockpiles have water sprinklers (show these on the site plan)***
- ***If suppression is provided within the picking booth (6.1.23 indicates this but no further detail is provided)***
- ***Explain if the sprinkler on the screener is fixed into position or mobile***
- ***Explain if the stockpile sprinklers are fixed into position***
- ***Explain if they are fed from water storage or mains***

Demonstrate there is sufficient supply and pressure to provide water to all the sprinklers and cannons as necessary
If treated water from the site treatment system is to be used what is the testing criteria to ensure the water is suitable for use and will not result in contamination of the site.
Reason: The Emissions Management Plan makes reference to water suppression when handling asbestos contaminated soils and screening soils. We however would anticipate suppression to be in place for all soil handling operations and when screening hazardous and non-hazardous (non-asbestos soils) this should be made clear.

In addition to the soil treatment area, the stockpiles with uncovered untreated soils will be subject to dust suppression by water based dust suppression plant. Please see 'Suppression Systems Location'
Drawing ref: 3982-CAU-XX-XX-DR-V-1810 and 'Suppression System Spray Arcs', Drawing ref: 3982-CAU-XX-XX-DR-V-1811

These will be mobile dust suppression systems to ensure that if the screener/picking station is moved then the dust suppression system can be relocated and maintain coverage of the soil treatment areas as well as any stockpiles with uncovered and untreated soils.

Dust suppression nozzles in the form of a spray rail is located onto the conveyor delivering soil to the picking station. However, asbestos monitoring results at the location of the picking station (operated without dust suppression measures) have always been <0.0005f/ml. No additional dust suppression is included within the enclosed picking station, as this would interfere with the accuracy of any asbestos monitoring that the Operator may want to undertake within the picking station enclosure.

The water-based suppression system on the screener will be fixed onto the hopper and conveyors to ensure dust emissions are not elevated during operation.

A mains water supply will be used to fill storage tanks for the dust suppression to ensure that there is adequate supply during working periods. Due to the potential presence of suspended solids in treated water and potential for blocking nozzle heads the dust suppression system will only use mains water for operation.

For the soil reception area, a mobile dust suppression system (Figure 2) is used, each unit has a 15m diameter range for dust suppression. This is used for the inputs received per day as the soils are then covered with a tarpaulin. These use approximately 0.4m^3 per hour when used.

The soil treatment area uses high flow rate dust suppression systems that the Operator currently employ at the Edwin Richards Quarry. This is a 2.5bar pressure nozzle system with a 10mm water inlet and a spray diameter of 25m. The water use is 0.69m^3 per hour. T
The Operator have tested this system externally and whilst the spray diameter is 25m under very windy conditions this can reduced to 18m diameter. The 18m diameter influence has been used in the design and this requires 4 No. high flow rate dust suppression points. The Operator have also included 2 No. mobile bowsers (see Figure 2) which could be used during windy conditions to supplement dust suppression or used during deliveries of soils to the reception area prior to covering with tarpaulins.
Water use for the 4 No. high flow rate system is 2.8m^3/hr and over an 8hr period could use up to 22.4m^3/day for soil screening and 6.4m^3/day for the soil reception assuming 8hr use. An identical system used at Edwin Richards Quarry has required the use of a 6m^3 storage tank (Figure 3) which allows for the dust suppression system to be used and continuously refilled using automatic level sensors. The storage requirements at Daneshill will be calculated based upon the measured flow rate for the nearby water supply.

Figure 2 – Mobile Dust Suppression Unit

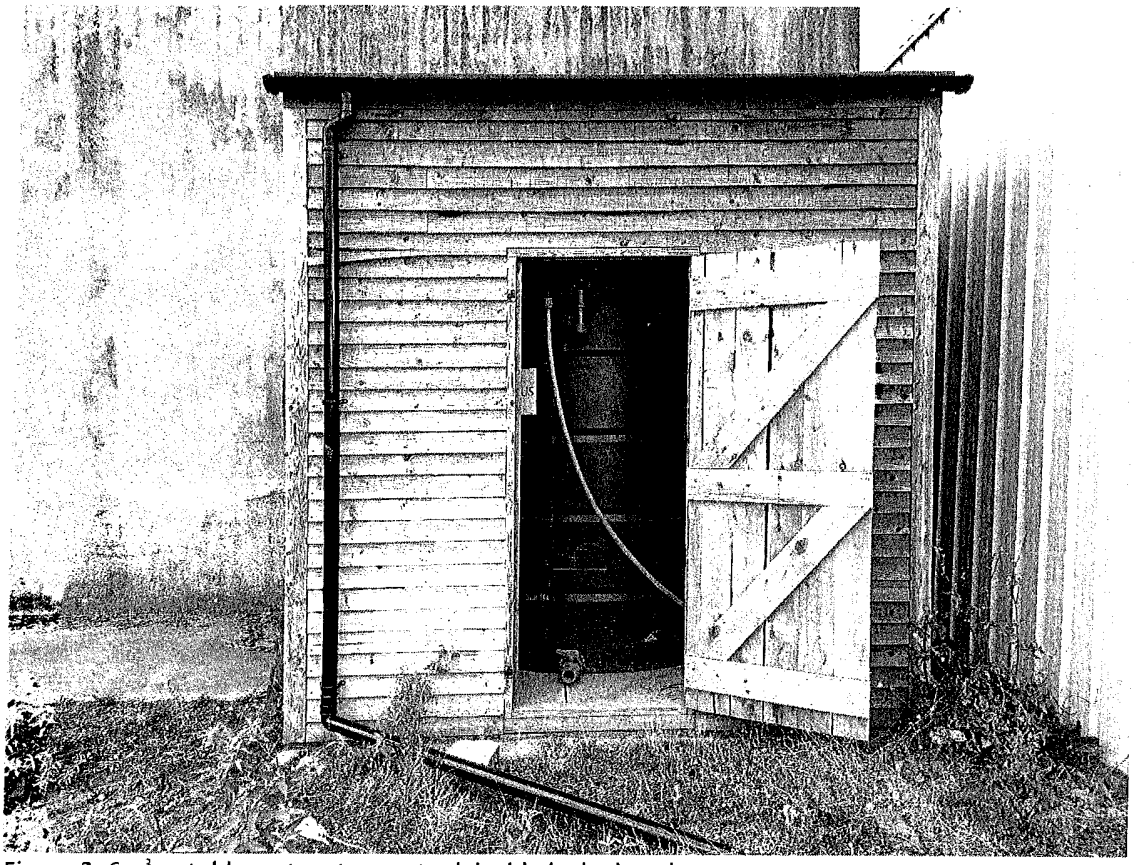


Figure 3. 6m^3 potable water storage tank inside locked enclosure

39) Provide details of the management procedures for fugitive emissions of (VOC, odour) resulting from waste handling, screening and biopile turning operations. How long are biopiles likely to remain open?

Reason – You must demonstrate measures in place meet the requirements of BAT 5. Waste handling measures have not been adequately described for example the soil turnover procedure details how this is undertaken but not how emissions are minimised.

The EMP provides little detail of the measures in place to prevent emissions of VOC from hydrocarbon contaminated soils particularly when screened.

Management procedures for fugitive emissions of odours are provided in the following table.

Table 5. Odour and VOCs Management

Source of Emissions	**Mitigation options**
Potential of odours/VOCs from details included in waste enquiry	• Site visit prior to input to assess the odour potential of soils • Only authorise if odours/VOCs are biologically treatable contaminants and can be mitigated easily on site, no residual unacceptable odour/VOCs could remain after treatment and air actively removed from soil can be treated by biofilter during treatment • Soils are only formally accepted subject to reception testing and compliance with the original waste description

Odour present upon receipt of waste load	• Review against original waste description and quarantine if required • Cover with tarpaulin/soil/woodchip prior to reception analysis results being received or formal rejection (use tarpaulin only for potential rejection) • Place on air extraction systems to capture vapours/odours
Odour/VOCs from biopile turning operations	• Monitoring of soil gases in extraction pipes to ensure total VOCs are below 40ppm/benzene below 1ppm prior to commencing soil turnover • Soil decompaction results in the opening of 3m wide sections of the biopile at any one time, this is to be sealed at the end of each working day • Biopile vacuum system to always maintain operation on pipes under stockpiled soil • Biofilter flow rates to be adjusted to increase retention time if there is odour potential at the biofilter during soil turnover
Odour/VOCs from screening soil	• No screening of high VOCs/potentially odorous soils is ever undertaken. No screening is required prior to, or during biotreatment • Only screen soils where odours are not present (i.e., completion of treatment is only complete when soils have no odour, are non-hazardous and meet the site reuse criteria)

40) ***Revise the PM10 emissions from vehicles section with reference to the Daneshill site. This is geared to deliveries with regards to a building and confirms a "tenfold reduction in PM10 emissions compared to existing". Please make it relevant to the activities at Daneshill. Provide details of the site specific measures here including details of haul routes and one way systems.***

Section 'PM10 emissions from vehicles' has been amended in the Emissions Management Plan (attached).

41) ***Provide clear details of the asbestos monitoring proposed at each separate stage of the process from storage, through treatment and final deposition post treatment. Include all detail within table 2 of the EMP.***

Reason – the details provided are vague. The EMP states monitoring will be undertaken hourly during screening and it will be also be undertake doing treatment of soils and hand picking. Specific detail is not provided. You must show the monitoring points on the site plan (see above). Provide details of how the monitoring is undertaken and if separate personal monitoring is undertaken.

Further details of asbestos monitoring will be provided subject to the pre-operation condition at Edwin Richards Quarry is agreed with Chris Hall, Richard Hadley and Clive Wall. The monitoring frequency is likely to increase in frequency to ensure works always achieve a <0.0005f/ml detection limit.

42) ***Explain the actions that will be undertaken if air testing during handpicking or screening shows exceedances of 0.01fibres/ml.***

Reason – its noted measures are included within the BAT document. For completeness they should also be included within the EMP.

A document prepared by an independent consultant (Steve Forster) is included for reference to actions taken at far lower trigger thresholds than the expected permit target of <0.01f/ml. This will prevent any potential for exceedance of the permit trigger level of <0.01f/ml. There has never been an occurrence of asbestos concentrations in air being elevated above <0.01f/ml in any of the operations the Operator have conducted under either the installations environmental permit or mobile treatment licence. This is included in Appendix G.

43) ***Provide details of the daily visual dust monitoring proposed. Include the locations on the emissions monitoring plan. Include the visual monitoring check sheet in the EMP. Explain what happens if visual monitoring identifies nuisance dust emissions.***

Nuisance dust emissions are not anticipated on treatment areas due to the measures previously described. However, the main potential for nuisance is anticipated from haulage routes around the site that are used to deliver soils to the treatment pads. These will be subject to standard dust suppression involving a bowser and a spray rail in accordance with the approach used on the adjacent landfill.

44) ***Revise the emissions monitoring plan to include the visual monitoring locations for dust, the locations of the Frisbee gauges and the VOC monitoring location. The locations of the asbestos pumps to be located around the working area during soil moving must also be included.***

See Emissions Monitoring Plan for Dust Asbestos and VOCs Drawing ref: 3982-CAU-XX-XX-DR-V-1812.

<u>Odour management Plan</u>

45) ***The OMP makes reference to 19 02 06 and 19 12 12 as potentially malodourous waste. These wastes however have not been included as proposed wastes in the main application documents, please clarify.***

The Odour Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0308.A0.C2 (attached) has been updated. These waste codes are included in error and have now been removed.

46) ***Explain the waste pre-acceptance and acceptance procedures for these potentially malodourous wastes. Explain how their odour potential is assessed.***

Reason – The OMP indicates this information is available in the soil reception procedure however this document does not mention potentially odorous wastes.

These wastes are not to be accepted at the site. All odour/VOCs management in soil are as previously described in this response.

Attached documents:
Appendix A: Water quality monitoring results
Appendix B: STC WI 003, Soil Characterisation Procedure
Appendix C: STC WI 002, Soil Reception Procedure
Appendix D: Hopper and Conveyor monitoring results
Appendix E: Decontamination, asbestos plant
Appendix F: STC WI 006 Soil Analysis
Appendix G: Outline Air Monitoring Strategy

Emissions Management Plan, document ref; 3982-CAU-XX-XX-RP-V-0307
Odour Management Plan, document ref; 3982-CAU-XX-XX-RP-V-0307

Site Layout Plan, Soils Treatment Pad 1, 2, & 3
Drawing ref: 3982-CAU-XX-XX-DR-V-1807

Surface and Foul Water Locations
Drawing ref: 3982-CAU-XX-XX-DR-V-1808

Water Treatment Plant Design and Containment
Drawing ref: 3982-CAU-XX-XX-DR-V-1809

Suppression Systems Location
Drawing ref: 3982-CAU-XX-XX-DR-V-1810

Suppression System Spray Arcs
Drawing ref: 3982-CAU-XX-XX-DR-V-1811

Emissions Monitoring Plan for Dust Asbestos and VOCs
Drawing ref: 3982-CAU-XX-XX-DR-V-1812

I trust the responses above to your Schedule 5 notice are satisfactory to continue the determination of the permit variation for Earls Barton Quarry. Should you require any further detail, please do not hesitate to get in touch.

Yours sincerely

Kellie-Marie Pacifico Burston

Senior Environmental Consultant
On behalf of Caulmert Ltd

Appendix A

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-30077-1
Initial Date of Issue:	06-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Jon Owens Sam Gould
Project	100993 Rowley Regis STC
Quotation No.:	Q21-25188
Order No.:	9/RR
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	06-Sep-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	31-Aug-2021
Date Instructed:	31-Aug-2021
Results Due:	06-Sep-2021

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-30077
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1269261
Order No.: 9/RR			Client Sample Ref.:		Asb 1
			Sample Location:		Asb Water
			Sample Type:		WATER
			Date Sampled:		27-Aug-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-31891-1		
Initial Date of Issue:	18-Sep-2021		
Client	Provectus Soils Management Ltd		
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG		
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould		
Project	100993 Rowley Regis STC		
Quotation No.:	Q21-25188	**Date Received:**	15-Sep-2021
Order No.:	9/RR	**Date Instructed:**	15-Sep-2021
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	21-Sep-2021
Date Approved:	18-Sep-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-31891
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1278758
Order No.: 9/RR			Client Sample Ref.:		Asb 3
			Sample Location:		Asbestos Water
			Sample Type:		WATER
			Date Sampled:		10-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-32698-1
Initial Date of Issue:	24-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould
Project	100993 Rowley Regis STC
Quotation No.:	Q21-25188
Order No.:	9/RR
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	24-Sep-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	21-Sep-2021
Date Instructed:	21-Sep-2021
Results Due:	27-Sep-2021

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-32698
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1283034
Order No.: 9/RR			Client Sample Ref.:		Asb 4
			Sample Location:		Asbestos Water
			Sample Type:		WATER
			Date Sampled:		17-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
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Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX B

STC – WI 003 - SOIL CHARACTERISATION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
7	Slight change in wording	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the sampling of soils received at the STC. See procedure STC – WI 002 Soil Reception for background information.

Objectives

The main objective of the operation is to ensure soils received at the Soil Treatment Centre (STC) are visually, structurally and chemically similar to those described by the waste producer during pre-acceptance, and therefore compliant with the Environmental permit and suitable for treatment and reuse. This will allow any non-conforming waste to be rejected.

Procedure

The sampling of soils will be performed by the STC technician or STC site manager. The procedure uses composite sampling methods as provided in BS812.

A minimum of at least one composite sample must be taken from each job (unique authorisation code/DW number) at the minimum frequency highlighted in Table 1 below. The STC site manager shall assess how many samples shall be sent to the laboratory for reception compliance testing, based on visual assessment, high risk job, knowledge of the client, material variation etc. Chemical testing is undertaken to ensure that the materials being tipped are consistent with the analysis and description provided by the client at the pre-characterisation stage.

Any additional samples taken which are not sent for chemical testing shall be stored in an appropriate storage place until the job/batch is disposed of.

Table 1: Requirements for sampling:

Volume of soil (t)	No. of samples needed (before or during acceptance at STC)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

The general suite of analysis for soils shall include:

- pH

- CLEA Metals
- Total TPH
- Total PAHs
- Total Cyanide
- Phenols
- SVOCs and VOCs (where required)
- PCBs (where required)
- Asbestos (screen and stage 2/3 quantification where asbestos is identified)
- Moisture content

However, these parameters may be adapted by the STC operations manager due to prior knowledge of contaminants derived from client waste description, history and data.

All analysis will be undertaken by a UKAS/MCERTS accredited laboratory using accredited methods.

Once the analysis results are received, they will be assessed by a suitably qualified and experienced STC manager to confirm they meet the requirements for treatment. These results are to be stored electronically onto the STC server.

Wastes of a liquid oil phase are not permitted for treatment at the site.

The contaminant limits are for the receiving batches. The contaminant levels will be assessed from the reception analysis and the mass within the soil inputs calculated. This would be compared to the mass of contaminant within the receiving batch. This will ensure that the soils are suitable to be added to the receiving batch whilst respecting the average hydrocarbon concentration.

The receiving batch has contaminant limits (these are not contaminant limits for soil inputs which can vary and exceed the average batch limits). The hydrocarbons in the batches will be limited to an average as shown in Table 2.

Concentrations for inorganics to be reviewed in accordance with WM3 (Jan 2021).

Asbestos concentrations to be assessed using criteria in Table 3, stage 3 quantification results to be received prior to any form of soil treatment commencing.

Should the results not conform to the requirements for treatment the waste will be rejected following the formal rejection procedure.

Table 2. Maximum Average Contaminant Concentrations for Receiving Batch

Substance	Carbon Range	Lower Elimination Rate	Upper Elimination Rate	Maximum average batch concentration (lower level) - mg/kg	Maximum average batch concentration upper level) - mg/kg	Comments
Petrol range organics	C6-C10	95%	99%	20,000	100,000	Limited by odour potential
Diesel	C10-C25	60%	90%	2,500	10,000	Target of below 1,000mg/kg for reuse even though diesel is only hazardous at 1% (10,000mg/kg)
Lube Oils	C25+	40%	65%	1,667	2,857	Review age of spill and soil type before assessing which elimination rate to use
Unknown Oil	C10+	40%	80%	1,667	5,000	Review age of spill, source and soil type before assessing which elimination rate to use
PAHs	C10+	30%	90%	1,429	10,000	Limited by odour potential
Phenols	C6+	90%	99%	10,000	100,000	Limited by odour potential
Solvents	C2+	95%	99%	20,000	100,000	Limited by odour potential
VOCs	C2+	99%	99%	100,000	100,000	Limited by odour potential

Table 3. Maximum Asbestos Contaminant Concentrations for Treatment

Substance	Maximum concentration (%) - Stage 3 Testing	Comments
Chrysotile	<0.1%	Bound forms of ACM only
Amphibole ACM Types	<0.01%	Bound forms of ACM only
Asbestos insulation/unbound asbestos	Absent	No acceptance of any form of asbestos in friable/insulation form

APPENDIX C

STC – WI 002 - SOIL RECEPTION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
6	Inclusion of asbestos procedures	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the assessment of data and inspection of waste received at the Soil Treatment Centre (STC). It allows rejection of non-conforming waste to ensure no untreatable contaminates are accepted into the STC, or which breach the list of permitted wastes as shown in the site's Environmental permit.

Principle of Operation

The inspection will allow the following to be assessed prior to acceptance:

- Presence of untreatable and hazardous materials (e.g. tars, clinker etc.) in the contaminated soil.
- Presence of excessive litter/debris in the contaminated soil.
- Compliance with the previously supplied chemical/physical analysis information (supplied by waste producer).
- Potential for the waste to behave as a liquid or have free water/oil in the waste.
- Inspect asbestos debris and visual appearance to ensure no unbound/insulation forms of asbestos are present

If the waste material is not compliant with the agreed conditions of the Environmental Permit or pre-acceptance assessment then the waste will be rejected.

Procedure

Pre-Acceptance Assessment

This is undertaken by Provectus to confirm treatability to meet the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer. These are agreed in writing between the Waste Producer and Provectus prior to an authorisation number (DW/enquiry number) being issued by FCC for deposit at the STC.

Where data gaps exist or queries remain about the suitability of material for treatment, Provectus will offer to attend the site of origin to undertake pre-acceptance analysis and visually inspect the material and obtain further information about the waste description.

In the event that the moisture content of the waste being in the range of 25-30% then the potential for free water or oil will be further reviewed. Where moisture contents are at this level or even higher and the material does not behave as a liquid, have the potential for releasing water/oil etc and is suitable for the biopile infrastructure then it would be accepted on a case by case basis.

Should either Provectus, or after consultation, FCC determine that there is the high potential for material to behave as a liquid or contain free water or oil then the waste will be declined for acceptance.

Duty of Care Documentation

No tipping on the STC will be permitted without relevant duty of care documentation from the waste producer. This must be checked on-site at the STC to ensure that the load is indeed destined for the STC, and that the documents are correctly completed. The consignee section of Consignment notes, for hazardous waste, and waste transfer notes, for non-hazardous waste, shall be completed by Provectus at the STC once the load has been deemed acceptable by the STC site manager.

Health and Safety

The STC site technician or STC site manager is to provide guidance to the tipper driver as to where to tip the load along with any relevant safety information, such as PPE requirements, prior to tipping. Site personnel must be at least 5m away from any moving plant or lorries on site at all times and must only approach if it is safe to do so and the driver has acknowledged them.

Visual Inspection: Waste Input

Each load of soil for inspection will be initially tipped onto the biopile/quarantine area. The STC site technician will inform the tipper driver to remain at the area until the inspection has been completed.

In the event of the material containing free water or oil, or any form of asbestos insulation/unbound asbestos types the load will be immediately rejected.

If available, an excavator will be used to expose any unsuitable materials and allow a comprehensive visual assessment. The STC site manager will determine the next action when this has been completed, this will comprise of the following:

- Waste is accepted and the tipper is permitted to leave the STC with the accompanying completed paperwork, or;
- Waste is not accepted and the unsuitable element of waste load, either partial or complete load is removed by excavator and placed back into the tipper. A rejection form is filled in on-site and both Landfill Manager (LM) and Sales Manager (SM) are informed. It is the duty of FCC to inform the Environment Agency of any rejected loads.

At the end of the waste acceptance procedure the soil will be placed into a stockpile for reception testing. All soils with bound asbestos debris to be formed into a stockpile covered with a tarpaulin prior to treatment. Co-ordination of soil treatment events is to be decided by the STC site manager.

Quarantining Loads: Procedure

In the event that a load is received that is suspected of containing non-conforming wastes or requires additional analysis that is detrimental to the reuse of the material post treatment, then this will be placed in the quarantine area on site. However, if the material is not at risk of being mixed with other inputs then it may be placed in an allocated biopile with its location recorded. The load(s) placed into quarantine will be segregated from other inputs. The stockpile will be labelled with a sign with the following information:

- DW Number
- Project Name
- Tonnage
- Date sampled

As soon as the chemical analysis is received it will be reviewed by the STC operations manager before being formally accepted or rejected from site.

Chemical Analysis: Waste Input

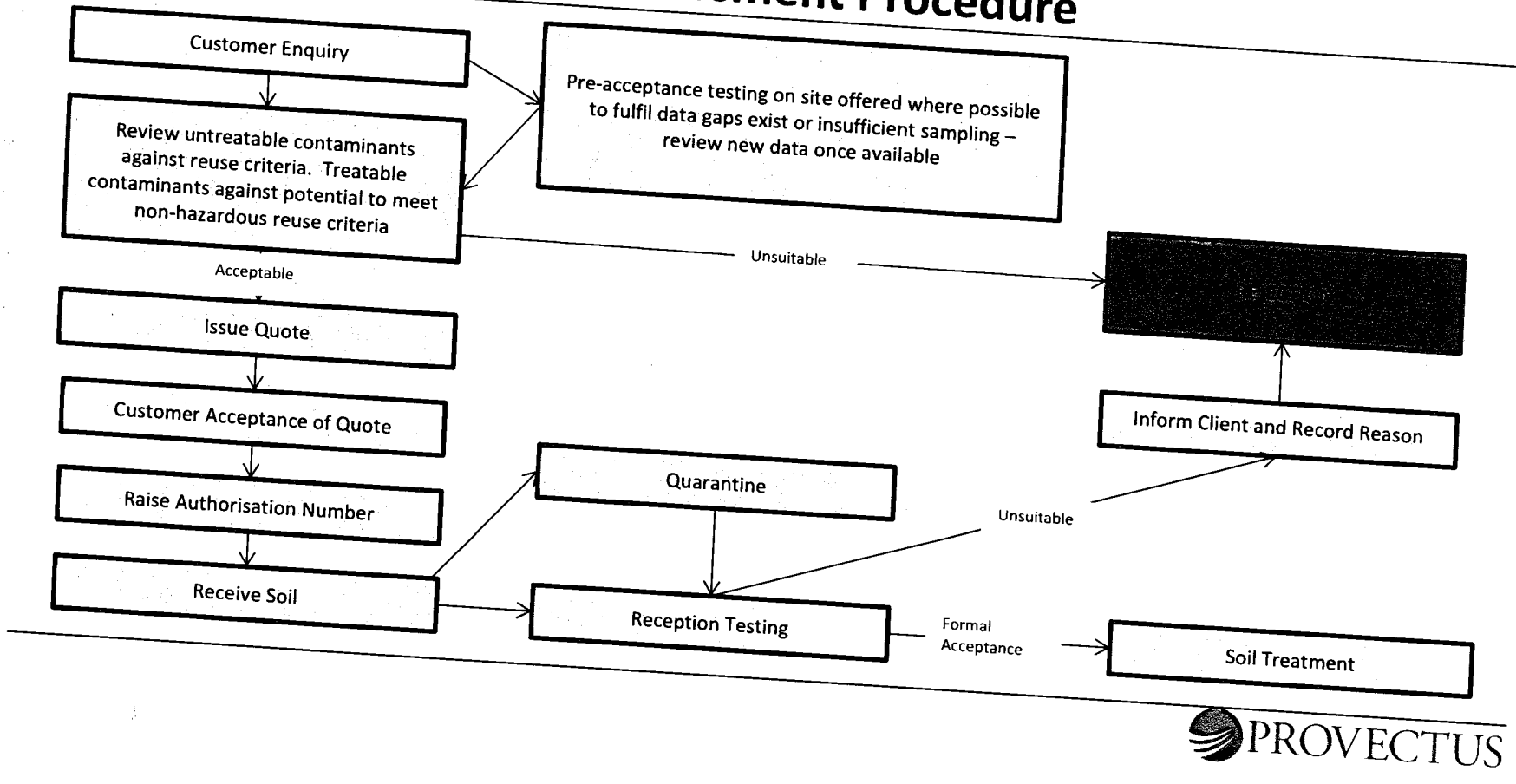
As a minimum, the sampling frequency for soils will be as per STC WI for each DW/enquiry. The STC site manager may increase the frequency of the sampling based on visual or olfactory evidence; Sampling will be undertaken on soils using composite sampling methods described in BS812.

The range of contaminants for analysis will be based upon the original contaminating substances. A copy of the analysis shall be checked by the STC site manager for verification against the original client data. In the event of non-conformity, the STC operations manager shall liaise with the STC project manager, and a decision on the next course of action will be taken.

The waste will only be formally accepted once reception analyses are received and approved in accordance with Soil Assessment Procedure illustrated in STC-PR02-V6 below.

STC-PR02-V6

Soil Assessment Procedure



PROVECTUS

APPENDIX D

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: Provectus Soils Management
Regent House
Bath Avenue
Wolverhampton
WV1 4EG

CONTRACT NO: S20825

DATE OF ISSUE: 20.09.21

DATE ANALYSIS REQUESTED: 16.09.21

DATE SAMPLES ANALYSED: 20.09.21

SAMPLES: Five airborne dust samples each supplied as two half gridded MCE membrane filters.

ANALYSIS REQUESTED: Fibre Counting using Scanning Electron Microscopy (SEM) with fibre identification by Energy Dispersive X-ray Spectroscopy (EDXS)

METHOD:

Each pair of half membrane filters is ashed in a low temperature plasma asher. The combined residue from each pair is recovered using filtered, distilled water and filtered through a 25mm, 0.4µm pore size polycarbonate filter. A portion of each polycarbonate filter is excised and mounted on a 13mm aluminium stub, coated with gold and examined by SEM. Each filter is searched systematically at 2000X magnification until an area of 1mm^2 has been examined or 50 whole fibres found. All respirable fibres (aspect ratio >3:1, length >5µm and diameter <3µm and including fibres in contact with particles >3µm diameter) detected are analysed by EDXS and identified as closely as possible, by comparing morphology and composition with standard reference materials. Fibre counting rules based on those of ISO14966:2019 were used.

The method used for analysis is documented in IOM instruction manual No.1 and is based on **International Standards Organisation (2019), International Standard 14966, Ambient Air: Determination of numerical concentration of inorganic fibrous particles - Scanning electron microscopy method.**

www.iom-world.org
Registered Address [illegible]

UKAS TESTING
0374

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

RESULTS:

Client Ref: PO – RR151

Sample No.	Volume (l)	[1] No. of Resp. Fibres Found	[1] No. of Fields Searched	Total Fibres *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	AMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	CMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	MMMF *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	NAM Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*
ERQ 1+2	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 3+4	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 5+6	1440	1	150	1 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1 / <0.0005*
ERQ 7+8	1440	1.5	150	1.5 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1.5 / <0.0005*
ERQ 9+10	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*

AMX-Amphibole Asbestos **CMX**-Chrysotile Asbestos **MMMF**-Machine Made Mineral Fibres **NAM**-Non Asbestos Mineral

* DETECTION LIMIT

When no fibres of a given type are detected, the fibre concentration can be reported as less than the concentration equivalent to three fibres (the one sided upper 95% confidence limit of the Poisson distribution). Therefore, when 0, 1 or 2 fibres are detected, 2.99 is used in the calculation of fibre concentrations. It expresses the 95% confidence detection limit for airborne fibre concentrations. When a volume of 1440 litres is used the 95% confidence limit is 0.0005 fml^{-1} for the number of fields searched.

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

COMMENTS:

No asbestos fibres were detected during the analysis of any of these samples.

Any organic fibres present on the original samples would be destroyed during plasma ashing.

Each sample supplied for analysis comprised two half membrane filters. These were combined during plasma ashing to form single samples with combined sample volumes of 1440 litres.

(1) UKAS accreditation for this work is limited to results obtained directly from the analysis. Calculated results based on sampling information provided by the client are out with the scope of this accreditation.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

IOM Consulting cannot accept responsibility for samples sent for analysis that have been incorrectly collected or despatched.

AUTHORISED BY: Steve Clark

S Clark
Mineralogy Section Manager

Appendix E

Decontamination of asbestos contaminated plant.

This memo is produced by HSENI to provide information and guidance to duty holders.

hseni
CONTROLLING RISK TOGETHER

What needs to be done?

a. Plant or machinery which has been used in the removal or disturbance of asbestos containing material (ACM), whether deliberate or accidental, is likely to be contaminated with asbestos debris and fibres. Depending on the degree of disturbance of the original material, the plant will be contaminated to a greater or lesser extent. Before it can be returned to service or the hire company, it must be thoroughly decontaminated to a high standard of cleanliness, such that there is no subsequent spread of asbestos or any exposure of persons to asbestos dust. In addition to obvious gross debris, disturbance of ACMs can produce very fine airborne asbestos fibres which can penetrate into the inner parts of the machine on air currents and deposit there.

b. The plant/vehicle should not be moved outside the contaminated area due to the risk of spreading asbestos contamination. Where a vehicle must be moved, the justification for this must be recorded in the Method Statement, together with steps necessary to prevent the spread of asbestos contamination.

c. It is not acceptable merely to power-wash the plant.

Establish how much.

d. To establish how contaminated a machine is may require the help of an accredited analyst, especially if there has been an excessive amount of disturbance of the ACM or disturbance of AIB / insulation; breakage or degradation/delamination of AC.

e. In any event, the person carrying out the assessment must be competent, have appropriate training, personal protective equipment and face-fitted respiratory protective equipment (see below). The risk of fibre release is greater if the disturbance was accidental and there were no controls in place. The assessment should involve a thorough visual examination with a bright torch, looking into trapping spaces, tyres, underneath etc. These should be detailed in the survey/risk assessment. The assessment should begin with the area surrounding the plant and, if necessary, an uncontaminated path to the machine should be established.

A risk assessment and plan of work (POW) are required.

f. A risk assessment should be carried out to establish the requirements for preventing the spread of ACM and exposure to asbestos dust during remediation and a POW (also known as a method statement) developed to describe how the work is to be done safely. In addition to the surface of the machine, consideration should be given to the possibility that asbestos fibres may have been drawn into the cab ventilation system and could potentially be emitted when the system is in operation. It may be necessary to erect an enclosure.

The risk assessment and POW will establish whether a licensed asbestos removal contractor (LARC) will be required to carry out the work. In general, if the contamination consists of 'licensable materials' – asbestos insulation board (AIB), thermal insulation or limpet, then a LARC will be required. Also in cases where there has been significant degradation of asbestos cement products, such as aggressive removal or fire damage, a LARC will be required.

Carrying out the procedure.

g. The persons carrying out the decontamination procedure must be trained at least to the appropriate level i.e. trained to work with non-licensable ACM, or, trained to work with licensable ACM where the contamination contains licensable material. Asbestos awareness training is **not** sufficient.

h. They must wear appropriate protection to avoid being exposed to asbestos fibres. This will normally consist of Type 5 disposable coveralls, P3 respiratory protective equipment (RPE) and non-laced footwear.

i. They must have Employers Liability Insurance which specifically covers working with asbestos containing materials.

j. The area surrounding the vehicle should be delimited by a cordon and hand-picked and visually cleared of ACM. A vacuum cleaner fitted with a HEPA filter may be required.

k. The exterior of the vehicle is likely to be most contaminated, and should be cleaned first. This would involve hand picking all material, ACM and non-ACM that is visible, and paying attention to less obvious places such as trapping places, tyres and the underside. The collected material should be double bagged and disposed of appropriately as asbestos waste.

l. The air intake filters to the engine should be replaced and the contaminated filters disposed of as asbestos waste.

m. The cleaned vehicle should then be wet-wiped and the rags disposed of as asbestos waste. At this point the exterior of the vehicle should be free from ACMs.

n. Consideration should then be given to the cab. The two probable mechanisms whereby asbestos could have penetrated the cab are by being carried in on clothing or footwear, or, by transport through the air, either directly into the cab through the doors or via the ventilation system. The air intake filters should be removed and disposed of as contaminated waste and clean filters fitted. Initially, a small capacity NPU unit should be run in the cab with the engine and the ventilation switched on. This should have the effect of dislodging and removing any fibres from the system and capturing them on the NPU filter.

Remediation would then require thorough cleaning of all surfaces, using appropriate means e.g. wet wiping or vacuuming (using a class H vacuum cleaner) or a combination of both prior to inspection. Moveable items which cannot be cleaned should be disposed of as asbestos waste.

Air sampling should be undertaken inside the cab with disturbance and the ventilation system running.

Certifying.

o. The 'clearance' of the plant for recommissioning or removal from the site must be carried out by a competent person. Where the work involved licensable material or degraded AC, and was carried out by a LARC, then the clearance should be carried out by an accredited analyst. A written declaration that the plant is free from asbestos contamination should be based on a thorough visual inspection of all parts of the machine, including 'trapping' places and air sampling in the cab if appropriate.

p. Assuming that the visual inspection and air test in the cab are satisfactory, the pathway across the ground to the site exit should be visually inspected and cleared of any ACM. When this has been completed, the competent person may release the plant. Care should be taken to ensure it does not become re-contaminated e.g. by the wheels running over material on the ground.

q. Once the plant has been moved, the ground underneath should be assessed for contamination and a method of work devised to decontaminate and clear this area.

NOTE

All work with asbestos needs to be carried out in accordance with the requirements of the Control of Asbestos Regulations (Northern Ireland) 2012 and the associated Approved Code of Practice 'Managing and Working with Asbestos' (L143 second edition)

Further information is available as follows:

- Asbestos essentials http://www.hse.gov.uk/pubns/books/hsg210.htm
- Managing and working with asbestos, Control of Asbestos Regulations 2012. Approved Code of Practice and guidance http://www.hse.gov.uk/pubns/books/l143.htm
- www.hseni.gov.uk
- www.hse.gov.uk/asbestos/

APPENDIX F

STC – WI 006 - SOIL ANALYSIS

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
4	Minor alteration to wording	01.09.20

Introduction

This procedure relates to the measures to be undertaken for the testing of soils treated at the Soil Treatment Centre (STC). This ensures that soils are suitable when received, are maintained in optimal treatment ranges and are validated in accordance with the permit. Once treatment is complete soils treated at the STC may be reused in several possible ways depending on the site. Namely, as soil for the quarry access road, restoration soils for the quarry backfill works or restoration soil for the landfill site.

Principle of Operation

The main objective of the reuse of soils is to ensure, in accordance with the Environmental Permit, that any material treated by Provectus is reused in a safe and environmentally acceptable manner. Quality control measures are implemented in order to prevent the reuse of soils to destinations either unintended, or unsuitable for the receipt of such soils. This operation is performed in conjunction with FCC, who operates the site where the soils shall be reused.

In-treatment batches of soil are monitored periodically as described in STC WI 004, when a batch of treated soil displays strong chemical evidence of meeting a non-hazardous reuse standard, a 'validation' sample is to be taken to generate a data report. This is to be reviewed by the STC operations manager and can then be sent to FCC to be formally approved for disposal.

Validation sampling should be carried out by the STC site technician or site manager, using a grid formation sampling plan. As a general rule one composite sample should be taken for every 500t.

The reception and validation samples should be submitted for the following analytical tests –

- Metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se & Zn)
- pH
- Speciated TPH (including BTEX)
- Speciated PAHs
- Phenols
- Total Sulphate
- Elemental sulphur
- Free Cyanide
- Total Cyanide
- Asbestos screen

Dependent on the contaminants of concern it may be necessary to request further parameters for testing on validation. Leachate analyses are required for reuse of soils in the restoration part of the landfill in accordance with the agreed risk assessment.

Procedure

Once the soil batch has been analysed by an accredited laboratory, and the results reviewed by the STC operations manager; a validation report shall be complied with information regarding soil volumes, validation analysis results, soil origin and ultimate destination. This shall be communicated to both the FCC Waste Assessment team and to the FCC site manager for approval and so that provisions can be made for the transfer of soils to the approved destination. The validation report and any supporting information shall be stored on the STC server.

Appendix G

APPENDIX A

OUTLINE ASBESTOS IN AIR MONITORING STRATEGY AND METHODOLOGY

1. **Outline Air Monitoring Strategy for Asbestos-Contaminated Soil Processing Operations at the Daneshill Soil Treatment facility (STF)**

2. Respirable asbestos fibres have the potential to cause serious health affects if inhaled in significant concentrations. This potentially could have an impact upon both exposed Site operatives and visitors to Site, in addition to people outside of the Site who may become exposed to significant fugitive emissions.

3. In order to demonstrate that the operational controls that will be put in place to mitigate the potential risks of exposure to respirable asbestos fibres are sufficient to eliminate significant risk, FCC will undertake monitoring for respirable asbestos fibres to check that fibres are not being released into the atmosphere on- and off-site.

4. In most circumstances, however, it is recognised that the extent of dilution in the environment of the very low levels of fugitive respirable asbestos fibres in air that may be anticipated from the proposed operation of the Site, will be considered sufficient to discount any significant exposure to members of the public over 100m from a potential source of any fugitive emissions arising from routine operations at the Site.

5. Asbestos in air monitoring will be undertaken generally in accordance with the provisions of HSE document 'HSG248'[1] by a laboratory accredited by UKAS to SO/IEC 17025 at the Site as identified below:

    a. Baseline ambient monitoring conducted on the proposed site of the proposed STF (baseline activity monitoring)

    b. Baseline ambient monitoring conducted at selected locations on the boundary of the Site, both upwind and downwind of the proposed STF (baseline boundary monitoring)

    c. Routine ambient monitoring conducted adjacent to potential dust-generating activities during representative periods of operation of the STF

    d. Routine ambient monitoring conducted at selected locations (as in b. above) on the boundary of the Site, both upwind and downwind, during representative periods of operation of the STF (operational activity monitoring)

6. Since it is highly unlikely that any employee carrying out operations on the Site will be subjected to elevated airborne asbestos concentrations approaching or exceeding the Control Limit of 0.1 fibres/ml averaged over four hours, or the Short-Term Exposure Limit of 0.6 f/ml over any 10-minute period, the need for personal sampling may be discounted.

---

[1] Health and Safety Executive. Asbestos: the analysts' guide for sampling, analysis and clearance procedures. HSG248. 2006. HSE.

7. It is recognised that boundary monitoring has its limitations; the primary emphasis when mitigating potential risks should be on ensuring control of exposure and spread of asbestos **at source** during operations that could potentially generate fugitive emissions.

8. Consequently, FCC will place significant reliance on ensuring that the operational controls that are set out in the Asbestos Plan of Work (APOW) and based on the Asbestos Risk Assessment (ARA) are monitored effectively and that any perceived failure or reduction in performance of these will trigger a 'Work Stop' action and a comprehensive of the ARA and APOW.

9. Consequently, less reliance will be placed on boundary monitoring results to flag when a review of controls is required, rather the monitoring will be conducted as a means of providing reassurance to management, the regulators (Environment Agency and the Local Planning Authority) and members of the public that operations are being sufficiently well-controlled in accordance with the **As Low as is Reasonably Practicable** (ALARP) principle so as to present negligible risk.

10. It is anticipated that both baseline and operational boundary monitoring samples will be collected from a maximum of four boundary locations representative of potential off-site receptor risks, to be determined.

11. It is anticipated that baseline and operational activity monitoring samples will be collected from a minimum of two locations representative of on-site activities, to be determined.

12. Outline Sampling and Analytical Strategy

13. The objective of the sampling strategy is to permit most samples taken on-site during the course of a day to be analysed on-site same day by the Analyst.

14. The sampling methodology implemented by the Analyst based on this outline strategy will be such that the Limit of Quantification (LOQ) of the method used for sampling and analysis on site, for a total of 20 fibres counted using phase contrast optical microscopy (PCOM), will be no greater than 0.002 fibres/ml for baseline and routine activity monitoring samples and 0.0005 fibres/ml, the WHO guideline value[2], for baseline and routine boundary monitoring

15. The LOQ is expected to be achieved by using a sample pooling approach, nominally with the following variable sampling and analysis parameters:

Baseline and routine activity monitoring

a. Number of filters per pooled sample – 2
b. Sample flow rate – 15 litres/minute
c. Sample duration – 80 minutes
d. Litres per sample filter – 1,200
e. Minimum average graticule areas counted per sample filter – 200

Baseline and routine boundary monitoring

f. Number of filters per pooled sample – 4
g. Sample flow rate – 15 litres/minute
h. Sample duration – 160 minutes
i. Litres per sample filter – 2,400
j. Minimum average graticule areas counted per sample filter – 200

[2] WHO. Air quality guidelines for Europe. WHO Regional Publications, European Series, No. 91. 2nd edition. 2000. WHO Regional Office for Europe

16. The Analyst will verify that the minimum LOQ can be achieved by reference to HSG248 and specifically calculate and report the final result in accordance with the formula and requirements of Appendix A1.35.

17. Routine activity monitoring will be undertaken at representative locations close to the activities being carried out, but not in such close proximity as to increase the potential for sample filters to become occluded by dust particles, or for the operations themselves to interfere with the safe operation of the sampling pumps.

18. Routine boundary monitoring will be undertaken at three locations downwind and one location upwind of the operations being carried out. Sampling locations must be selected to ensure that there is minimal possibility for members of the public to interfere with the safe operation of the sampling pumps.

19. Samples will be taken at a height of 1.5 to 2m above ground. The sampling flow rate will be set to achieve a minimum sample volume over a specified time period as above.

20. The monitoring at each location will comprise the use of a reliable battery-operated high-volume flow-compensated air-sampling pump and a 25mm diameter mixed ester of cellulose or cellulose nitrate membrane filter of 0.8 to 1.2um pore size with a printed grid mounted in a thoroughly cleaned sampling head and cowl all in accordance with the provisions of HSG248.

21. Pumps must be capable of:

- giving a smooth airflow;
- having flow set to within ±5% for flow rates >2 litres.min^{-1};
- maintaining this flow rate during the period of sampling.

22. The pump's battery must have sufficient power to operate within the specified flow limits for the duration of the measurement.

23. Outline Analytical Strategy – Extended Analysis

24. The PCOM fibre counting method does not distinguish between asbestos fibres and other fibres that may be present in the air (e.g. gypsum, mineral wool, fibreglass, cellulose etc.).

25. Accordingly, provision will be made by the Analyst to retain one half of each sample filter to be sent off-site for analysis by scanning electron microscopy coupled with energy-dispersive x-ray analysis (SEM-EDXA), should the need arise due to elevated PCOM total fibre counts, to positively identify asbestos fibres to a quantification limit of less 0.0005 fibres/ml.

26. Quality Assurance

27. FCC will ensure that an effective quality assurance/quality control (QA/QC} system will be put in place to ensure high-quality results and to eliminate invalid data.

28. Operational Monitoring and Response Standards

29. In order to serve as a cross-check on the efficiency of operational controls, in the absence of any perceived failure or reduction in performance of these, the thresholds in Table 1 will be adopted:

Table 1 – Monitoring Thresholds and Alert Levels

Routine activity monitoring		Routine boundary monitoring	
Green Alert	<0.002 fibres/ml < 5 fibres counted	**Green Alert**	<0.0005 fibres/ml < 5 fibres counted
Amber Alert	<0.002 fibres/ml > 5 and <10 fibres counted	**Amber Alert**	<0.0005 fibres/ml > 5 and <10 fibres counted
Red Alert	<0.002 fibres/ml >10 fibres counted	**Red Alert**	<0.0005 fibres/ml >10 fibres counted

30. For routine activity monitoring:

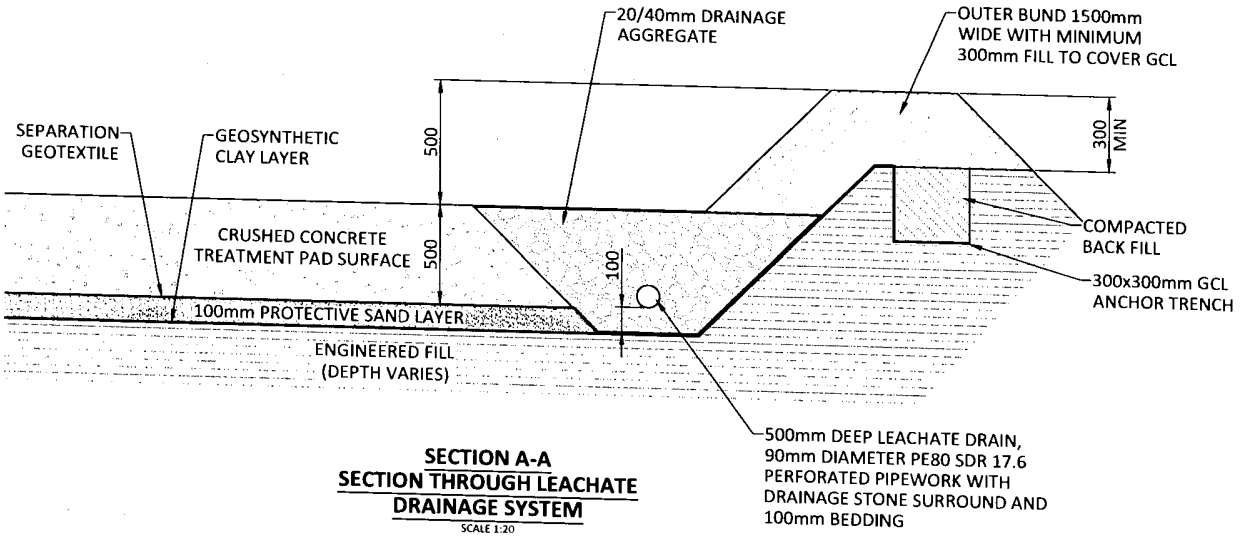
Table 2 – Monitoring Alert Levels and Actions

Routine activity monitoring and Routine boundary monitoring	
Green Alert	Normal operational state.
Amber Alert	Conduct review of wind direction for potential off-site contributory factors. Conduct review of waste input materials. Conduct operational checks on fugitive dust controls; increase as necessary. Initiate repeat sampling as appropriate. Enter report in Site Log.
Red Alert	[illegible]

31. Reporting

32. All monitoring data will be held on site in an accessible format for the purposes of regulatory inspection and compilation of management reports.

Drawings



SECTION A-A
SECTION THROUGH LEACHATE DRAINAGE SYSTEM
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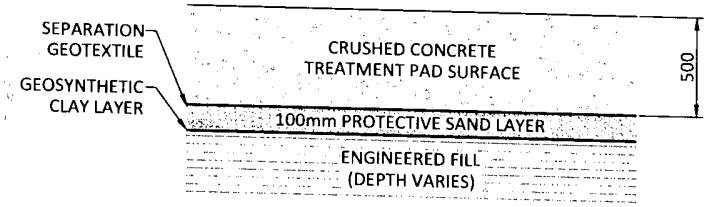
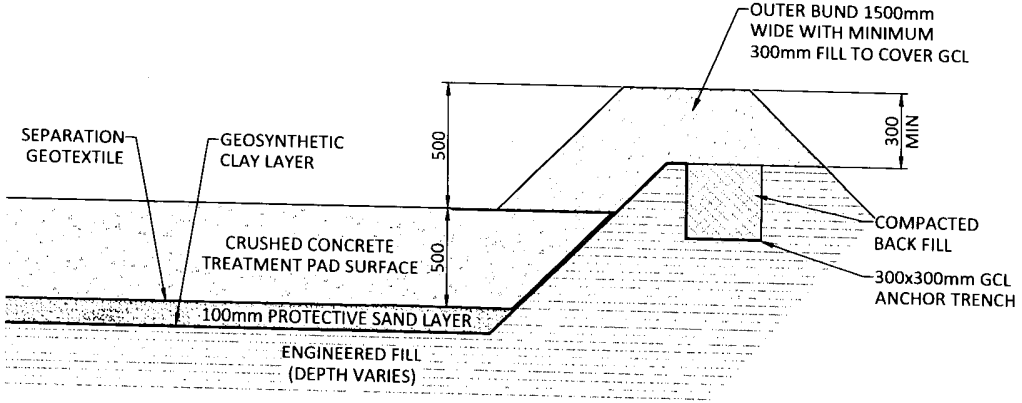


SECTION B-B
SECTION THROUGH TREATMENT PAD
SCALE 1:20



SECTION C-C
SECTION THROUGH TREATMENT PAD & EDGE BUND
SCALE 1:20

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. SECTIONS POSITIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-V-1808

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	AMENDED TO ENGINEERS COMMENTS	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SECTIONS DRAWING

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF:	REVISION
05.02.2020	AS SHOWN	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-C-1806

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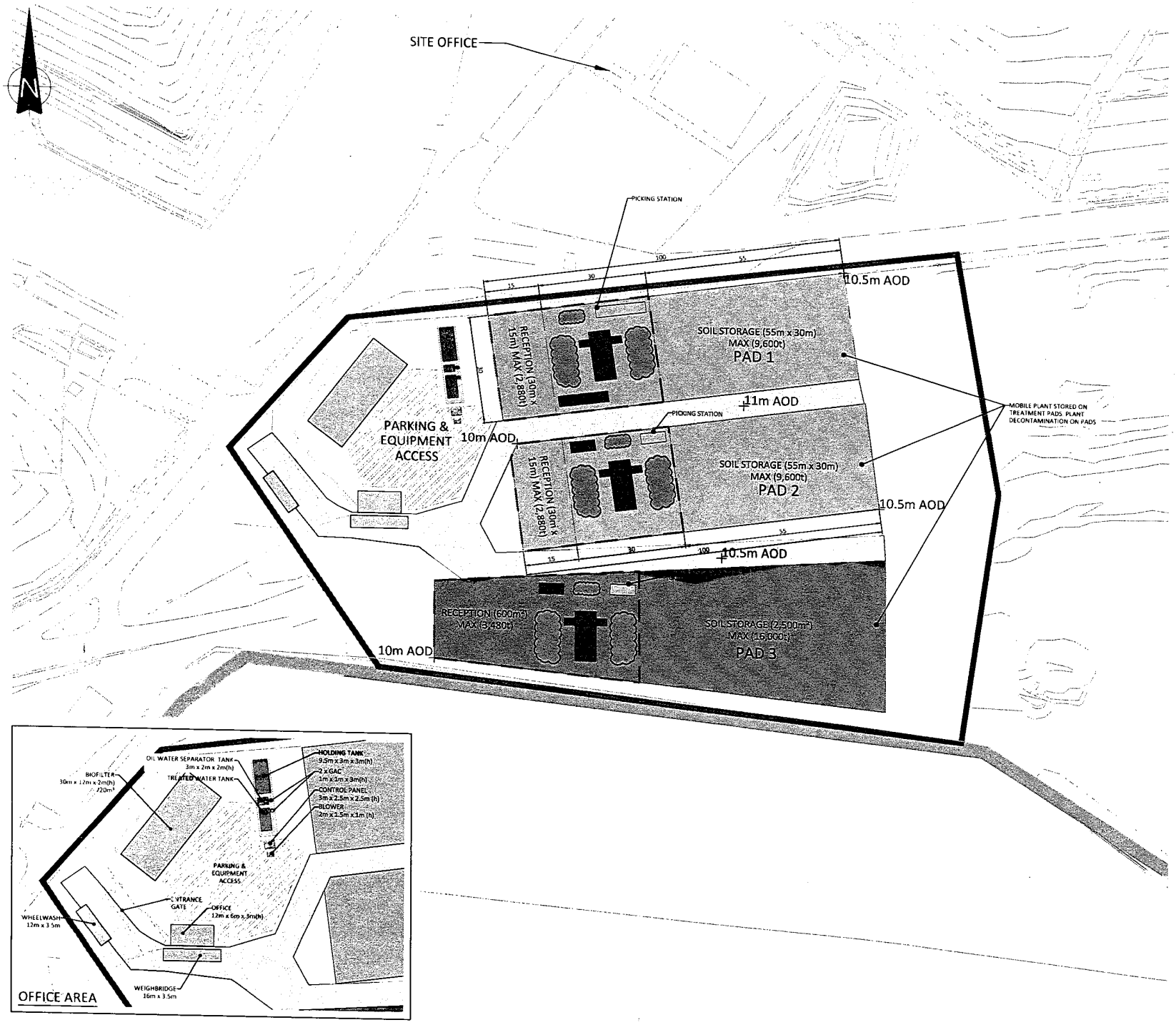

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	WHEEL WASH POSITION AMENDED	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: fcc Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SOILS TREATMENT PADS 1 / 2 / 3 SITE LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:1000	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1807

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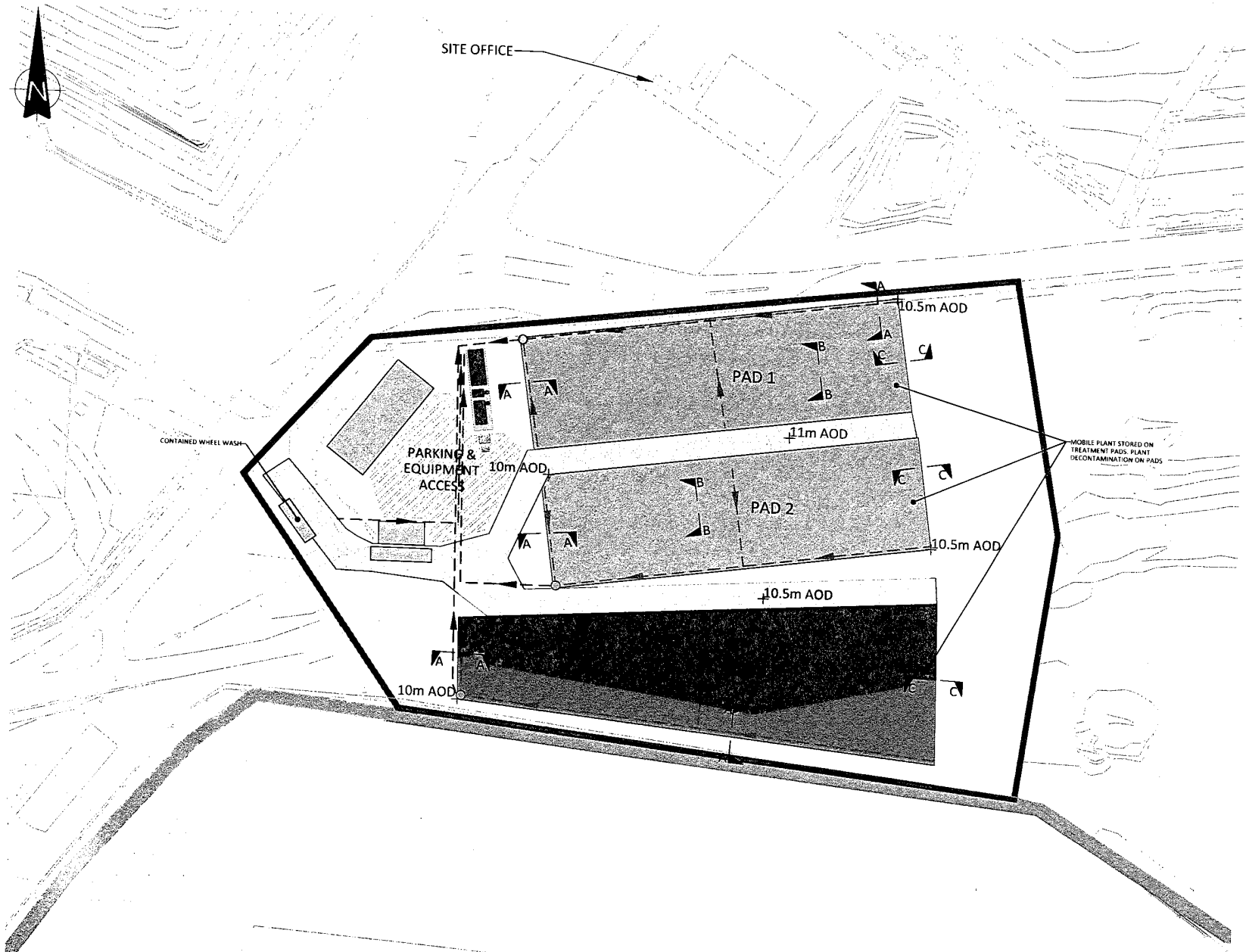

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- CONNECTION BETWEEN PUMPING CHAMBER AND WATER TREATMENT SYSTEM
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SURFACE AND FOUL WATER LOCATIONS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:1000	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1808

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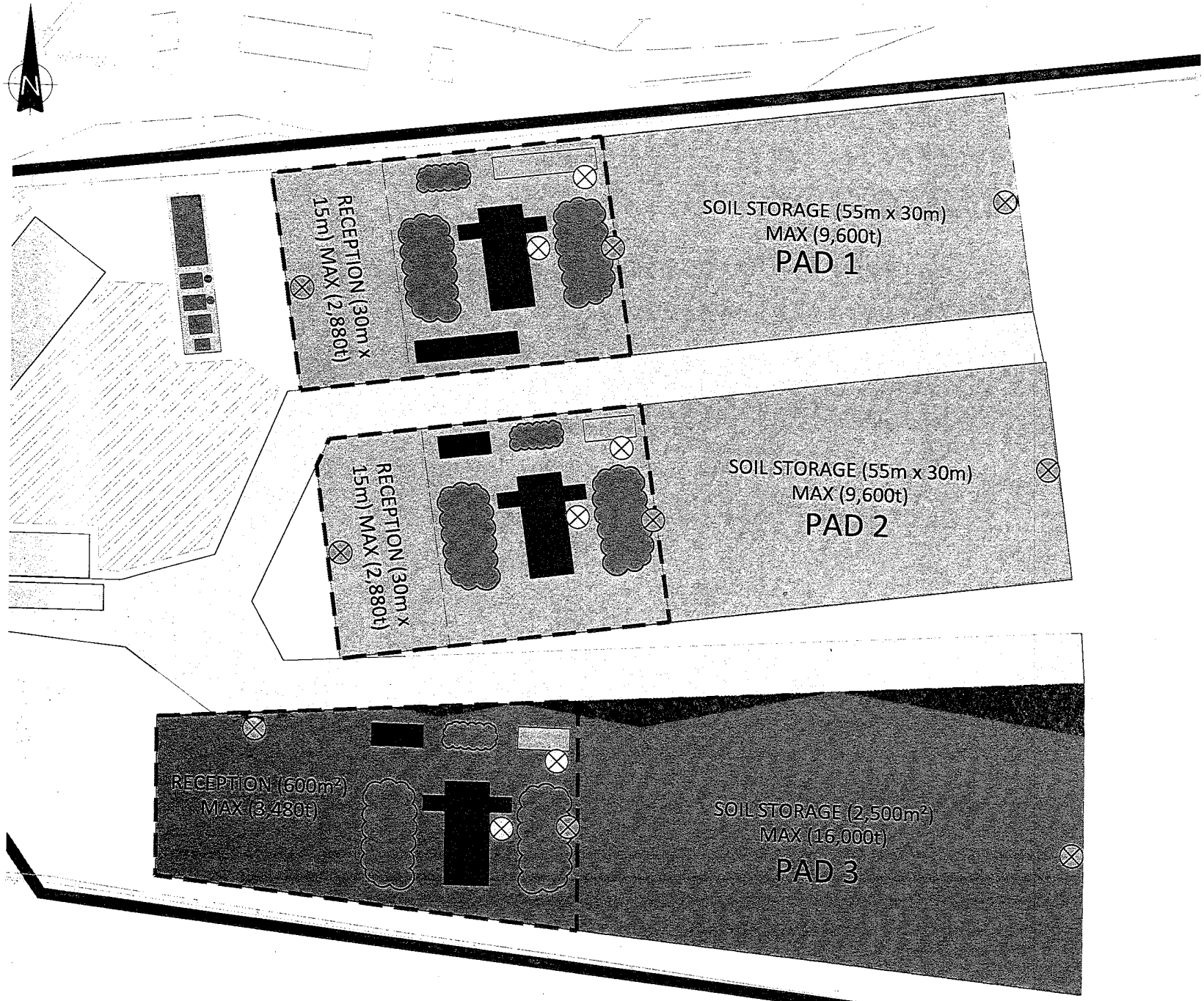

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- ⊗ <0.0005f/ml ASBESTOS MONITORING POINT
- ⊗ HAND HELD VOC's (PID) AND DUST MONITORING (NEPHELOMETER) LOCATIONS INCLUDING RECORD OF VISUAL DUST

REV					
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: EMISSIONS MONITORING PLAN FOR DUST, ASBESTOS AND VOC's PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:500	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1812

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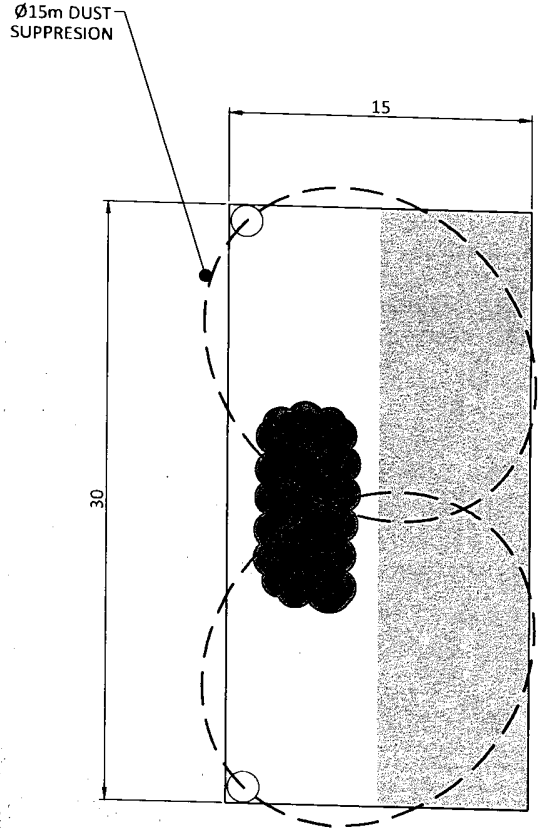
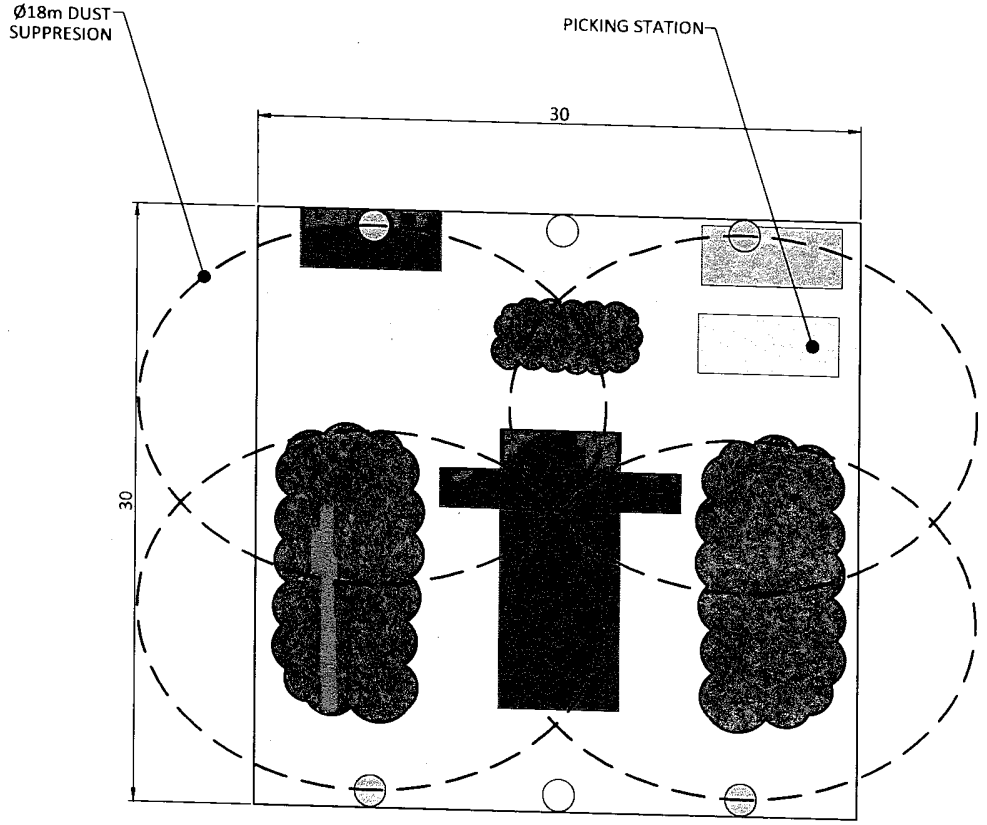


SOIL RECEPTION AREA



SOIL TREATMENT AREA

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- UNCOVERED SOILS (DAILY INPUTS)
- COVERED SOILS AWAITING RECEPTION TESTS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- SUPPRESSION SYSTEMS SPRAY ARCS

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SUPPRESION SYSTEM SPRAY ARCS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:250	3982	P01

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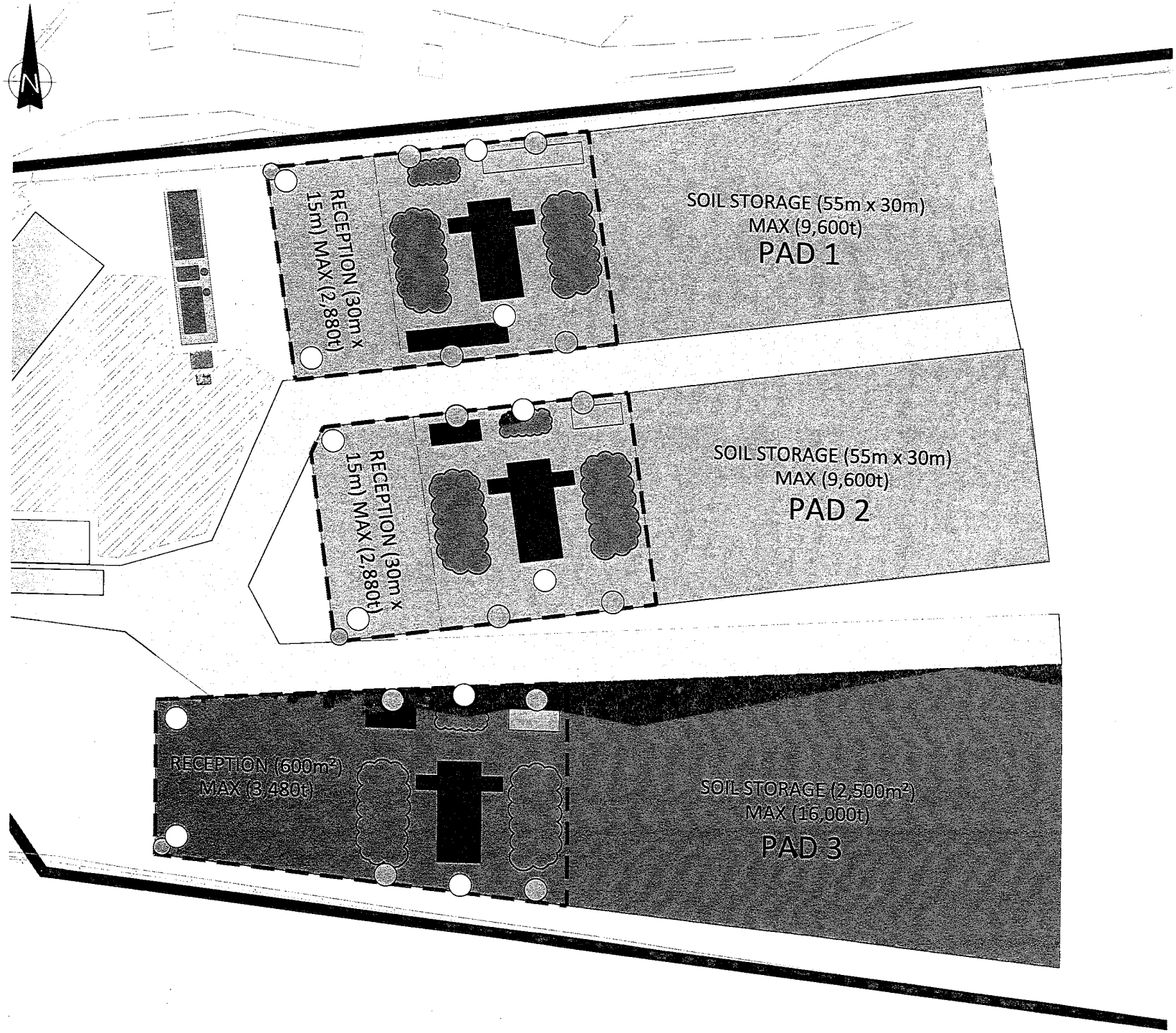

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- WATER COLLECTION AND PUMPING CHAMBERS

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30 09 21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SUPPRESSION SYSTEMS LOCATION FOR TREATMENT PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:500	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1810

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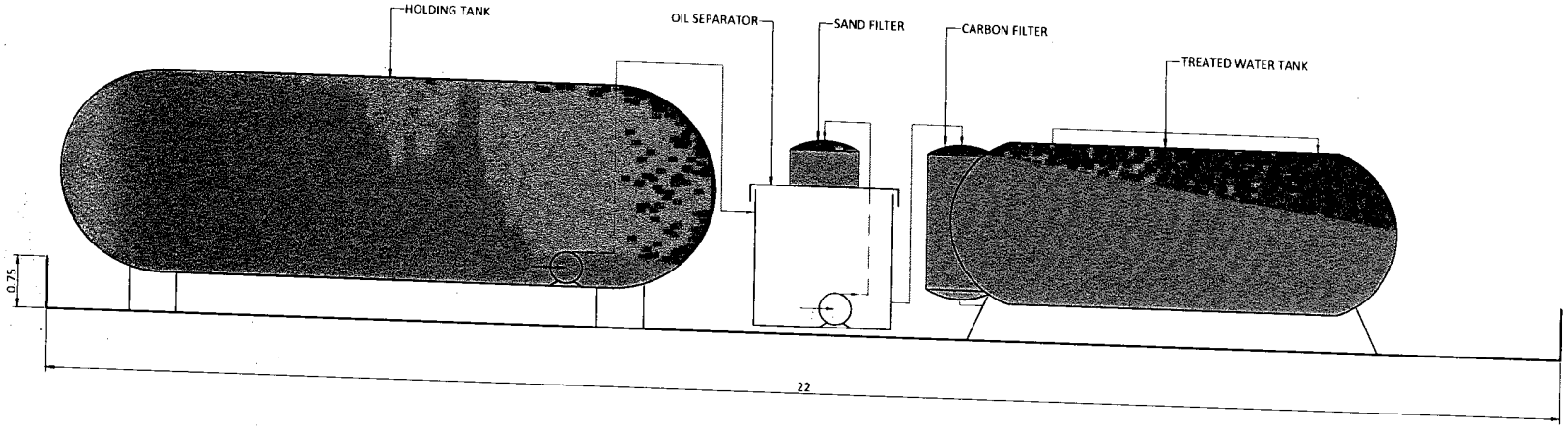

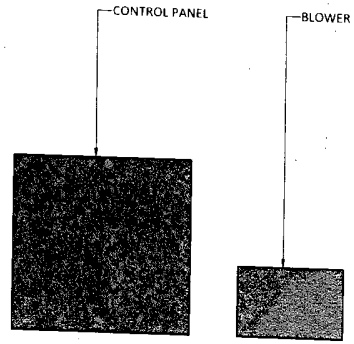

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P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: WATER TREATMENT PLANT DESIGN AND CONTAINMENT

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A2	JOB REF	REVISION
29.09.2021	1:50	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1809

Caulmert

Emma Conwell

From: Kellie Burston
Sent: 01 October 2021 17:40
To: Dunmore, Katie
Cc: James Cook; Andy Stocks; Jon Owens
Subject: EPR/NP3538MF/V009 Daneshill Soils Treatment Facility Schedule 5

Good Evening Katie,

Please see below the document links for the Schedule 5 response for the Daneshill Soils Treatment Facility, relevant drawings and appendices are also included within each of the document links.

Daneshill Response Letter, document ref: 3982-CAU-XX-XX-CO-V-9001-A0.C1
https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:356bee00-6c21-4068-8260-26bd0402e950

Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.A0.C2
https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:0822ab69-d884-4bcc-9477-530270b2bb5f

Odour Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0308.A0.C2 https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:d44cedfc-fa8f-456f-9812-b22b963d93e4

Should you have any questions or queries, please do not hesitate to get in touch with myself or Andy Stocks

Kind Regards
Kellie

Caulmert
engineering, environment and planning

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Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Odour Management Plan

Prepared by:

Caulmert Limited
Nottingham Office, Strelley House, Main Street, Strelley, Nottingham, NG8 6PE
Tel: [redacted]
Fax: [redacted]
Email: [redacted]
Web: www.caulmert.com

Document Reference: 3982-CAU-XX-XX-RP-V-0308.A0.C3

November 2021

APPROVAL RECORD

Site:	**Daneshill Soils Treatment Facility**
Client:	**FCC Recycling (UK) Limited**
Project Title:	**Environmental Permit Variation**
Document Title:	**Odour Management Plan**
Document Ref:	**3982-CAU-XX-XX-RP-V-0308-A0.C3**
Report Status:	**Final**
Project Manager:	**Andy Stocks**
Caulmert Limited:	**Nottingham Office, Strelley Hall, Main Street, Strelley, Nottingham, NG8 6PE**
Tel:	**01773 749132**

Author	Kellie-Marie P. Burston	**Date**	15/01/2021
Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021
Revised	Kellie-Marie P. Burston	**Date**	03/11/2021

DISCLAIMER

ODOUR MANAGEMENT PLAN

TABLE OF CONTENTS

DRAWINGS

3982-CAU-XX-XX-DR-V-1800	500m Receptors Plan
3982-CAU-XX-XX-DR-V-1801	Site Location Plan
3982-CAU-XX-XX-DR-V-1804	Daneshill Landfill Site and Soil Treatment Facility
3982-CAU-XX-XX-DR-V-1805	Proposed Layout Plan
3982-CAU-XX-XX-DR-V-1806	Cross Sections Drawing
3982-CAU-XX-XX-DR-V-1807	Treatment Pads 1, 2, and 3 Site Layout Plan

APPENDICES

Appendix 1	Soil Reception Procedure
Appendix 2	Air Quality Impact Assessment

1.1 Report context

1.1.1 FCC Recycling (UK) Ltd (hereafter referred to as the 'Operator') operate Daneshill Landfill Site, which is located approximately 2km east of Lound Village, Nottinghamshire at National Grid Reference SK6755086750.

1.1.2 Caulmert Limited were appointed by the operator to prepare an application to vary the existing permit: EPR/NP3538MF to include a Soil Treatment Facility (STF) which will operate on a newly constructed compost pad within the landfill site boundary. In addition to the STF, the Operator proposes a number of variations to add the following listed activities to the current permit:

- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.1.3 In addition to the details above, this odour management plan (OMP) has also been written to support a planning application whereby a Scoping Opinion request for the Soil Treatment Facility was made by Barton Wilmore in October 2019. A reply was received on 12th November 2019 from the Waste Planning Authority (WPA), Nottingham Council. The Scoping Opinion established that the proposed development was not in a sensitive area, although it exceeded 0.5ha in plan area and therefore is required to be assessed for any significant effects on the environment, including odour. The Operator are required to submit an OMP to consider the impact of odour on receptors as a result of the construction and operational activities of the STF. This OMP provides means of assessing the effectiveness of control measures. The proposed Odour Action Plan should be implemented in cases of failure and odour events. This document looks at current procedures for investigating odour events and includes reference information on the understanding of odour nuisance.

1.1.4 The OMP has been prepared in reference to the Environments Agency's Technical Guidance Note H4 Horizontal Guidance for Odour[1] and the recommended Best Available Techniques (BAT) for odour control at waste management facilities.

[1] Environment Agency. March 2011. Technical Guidance Note IPPC H4 Horizontal Guidance for Odour (Parts 1 & 2).

1.2 Standards and Guidance Relating to Odour Nuisances

1.2.1 There are no statutory standards for odour, currently the Environment Agency have published their guidance, Environmental Permitting: H4 Odour Management.

1.2.2 This guidance makes relevance to measures necessary to prevent or minimise odour pollution (if prevention is not practicable). Where appropriate measures to take will depend on the industry sector and site-specific circumstances with reference to costs and benefits.

1.2.3 There are two distinct types of odour nuisance covered under UK legislation: 'statutory nuisance' and 'odour nuisance likely to cause a loss of amenity', with the main legislation in respect of odour generation being the Environmental Protection Act (EPA) 1990.

1.2.4 Enforcement of the Act (in regard to nuisance), is currently under the jurisdiction of the EA, Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance.

1.2.5 Whilst there are no European or UK specific regulatory standards for the assessment of the impact of odours. It can be reasonably argued that loss of amenity and complaints are likely to occur when odours become detectable and recognisable. To be a statutory nuisance the odour needs to be seen to be affecting the comfort or enjoyment of the complainant's property or the public at large and the source of the odour also needs to be beyond reasonable doubt.

1.3 Soil Treatment Operations

1.3.1 The STF is proposed to accept and process a maximum 29,999 tonnes per annum of hazardous soils containing visible bound pieces of asbestos and/or hydrocarbons and 20,001 of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The usual maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks. The STF will operate within the footprint of the Daneshill Landfill Site permit as shown in drawing ref; 4239-CAU-XX-XX-DR-V-1804.

1.3.2 The treatment areas consist of 2 treatment pads measuring at 3000m^2 and 3000m^2 for biotreatment/physical treatment and another 1 x 4000m^2 treatment pad solely for screening/processing. An indicative operational layout of the treatment and processing area and cross section is detailed in drawing refs 3982-CAU-XX-XX-DR-V-1805, 3982-CAU-XX-XX-DR-V-1806 and 3982-CAU-XX-XX-DR-V-1807.

<u>Bioremediation Process Description</u>

1.3.3 The biological treatment process varies between 8 to 16 weeks, dependent on the contaminants present in the soil.

1.3.4 Bioremediation of soils will be undertaken on a newly constructed geo-composite clay lined crushed treatment pad with sealed drainage to holding tanks. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully.

As there is no drainage network on site, all process waters will be pumped to on-site holding tanks with excess water tankered off to an appropriate disposal facility.

1.3.5 Soils accepted at the STF are deposited by tipper lorry on the treatment areas. The soils are arranged into stockpiles for initial testing to ensure compliance with the client's waste description, these are managed using a system of batches/lots which allows the waste to be categorised by age and trackable from the point of origin to its location on the treatment pad and subsequent treatment.

1.3.6 Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

1.3.7 Biodegradation of the organic contaminants is carried out by microorganisms in the soil. This can be enhanced by addition of very low concentrations of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Management of moisture content is also essential for microbial activity; low moisture content will inhibit microbial growth, but excessive moisture can restrict airflow. The perforated aeration pipes located beneath the waste will extract air from the biopile to effectively control soil oxygen levels and moisture content to maintain aerobic conditions (i.e. oxygen levels >10%).

1.3.8 Temperature in the biopiles is maintained between 30 and 40°C to ensure the mesophilic microflora are predominately stimulated, optimising biodegradation.

1.3.9 The stages of the bioremediation process are detailed below:

- Initial Placement: The soil deposited on the treatment pad will be formed into a biopile by a 360 excavator.
- Addition of Nutrients: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.
- Chemical Analysis – Approximately every 4 weeks the soil is analysed for contaminant concentrations to determine whether the biological treatment of the soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process.
- Nutrients testing – Every 2-4 weeks the soil is analysed for nutrient levels within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process. This is supported by the chemical analysis of the soil for contaminant concentrations.
- De-compaction of the soil – Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil.

- Validation testing: Once the soil meets the re-use criteria, the soil is removed from the treatment pad and transferred to the non-hazardous soils storage area or directly to the landfill.

1.3.10 On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent landfill void or reused on site as restoration soils. The treated soils are stored externally as shown on Site Layout Plan, pending disposal or removal off-site

Asbestos Treatment Process Description

1.3.11 The processing of soils with asbestos debris is predominantly undertaken on soils with no volatile or potentially odorous inclusions.

1.3.12 Soil is initially received by tipper lorry and placed on the treatment pad and sampled to ensure the client's initial waste description is correct. Whilst the results are awaited the soils are sheeted to prevent wind borne dust or any odour emissions from occurring.

1.3.13 Soils with no potential for odours will be subject to screening and asbestos picking as stated within the operating techniques for the permit.

1.3.14 Soils with the potential for odours will be assessed further to establish if screening or hand picking will give rise to odours that can be detected at the site boundary. If odours are deemed possible at the site boundary as a result of screening or hand picking then the soils will be rejected from site. There will be no acceptance of soils at the site that would give rise to odours during the asbestos screening and picking treatment works.

1.4 Air Quality Impact Assessment

1.4.1 An air quality impact assessment (AQIA) was undertaken for the proposed development. The scope of the assessment was to consider the potential air quality impacts on human health from the emissions of VOCs.

1.4.2 With respect to odour, the report concluded that:

"The predicted odour at the nearest sensitive receptors are well below the odour detection threshold for all pollutants".

3.1 Sources

3.1.1 The contaminated soils accepted on site may contain odorous substances, it is considered that the asbestos element in asbestos containing soils is unlikely to be a source of odour, however the soils could present an odour source. Odour may present a nuisance to surrounding human receptors or cause an adverse impact to the environment.

3.1.2 The current and proposed activities associated with the STF that have the potential to produce odorous emissions are:

- Delivery of waste to site and deposit onto the treatment pad and initial pre-acceptance assessment;
- Bioremediation of potentially contaminated soils including initial formation, aeration and turning;
- Biopile emissions via biofilter and/or treatment of surface waters
- Screening and hand picking of soils; and,
- Storage and transfer of residual material removed from screening process.

3.1.3 Soils accepted for treatment can potentially contain odorous organic substances due to the presence of the following hydrocarbons:

- range of petroleum hydrocarbons (petrol, heating fuel, diesel, used oils, crude oil etc.);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- creosote;
- phenols; and
- chlorinated solvents and other Volatile Organic Compounds (VOCs).

3.1.4 The wastes types to be accepted at Site are set out in within the Permit Application. Odorous contaminants known to be difficult to either; treat to a level with no residual odour (e.g. chlorinated phenols), or effectively control/eliminate odours from, will not be accepted for treatment.

3.1.5 During biotreatment, the optimum temperature, oxygen and moisture conditions for the treatment process will be maintained to reduce the odour emissions potential. An absence of sufficient oxygen within the piles may lead to the biodegradation of the material under anaerobic conditions, increasing the potential for malodourous emissions. The current bioremediation method maintains optimum aerobic conditions in the waste by continuously extracting air through the soil to ensure consistently aerobic conditions to be maintained with optimal oxygen levels. This allows optimal contaminant mineralisation to take place.

3.1.6 Extracted air is passed through a biofilter to remove odorous contaminants. This filter operates continuously and removes approximately 99% of the monitored volatile organic contaminants that have the potential to cause odour. An Emissions Management Plan (Document ref: 3982-CAU-XX-XX-RP-V-0307) is in place with details on monitoring on site to confirm the effectiveness of the biofilter process.

4.1 Meteorological conditions

4.1.1 It is considered that the principle mechanism for the transit of odour emissions from site activities to nearby sensitive receptors is likely to be via airborne. Meteorological conditions will heavily impact and determine the level of risk and exposure to sensitive receptors. The following factors are likely to influence the risk:

Wind Direction & speed

4.1.2 The dominant wind direction determines which receptors are likely to be impacted and levels of exposure. Wind speed will affect the likely distances odours can be transported, however, in contracts increased wind speed is likely to dissipate odours.

Ambient air temperatures

4.1.3 Higher temperatures and warmer conditions can result in an increased risk of odour emissions from site. Staff will be trained to be vigilant of meteorological conditions and those likely to encourage odour emissions.

5.1 Local Sensitive Receptors

5.1.1 The Site is centred on national grid reference SK6764786722 within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. The location of the proposed activity relative to the surrounding area is shown in the Site Location Plan drawing ref; 3982-CAU-XX-XX-DR-V-1801.

5.1.2 The proposed STF site is in a predominantly agricultural setting of which Loundfield Farm is located 500m to the east. Other nearby residential and domestic dwellings include a few properties and a travellers site located on Daneshill Road. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

5.1.3 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

5.1.4 A review of the prevailing wind direction has identified that the most dominant wind is from the south-west/south-south-west towards north-east/north-north-east. The wind direction is likely to blow towards Mattersey Village and agricultural fields. Given the distance from the site boundary and the transient nature of odours from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

5.1.5 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

5.1.6 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

5.1.7 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

5.1.8 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Traveller's Site	Residential	155m	SWS
Daneshill Road	Public road	250-500m	S, W, SW
Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

5.1.9 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

5.1.10 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

5.1.11 The site is not located within a flood risk zone.

6.1 General Control Measures

Waste Acceptance

6.1.1 In general, the pre-acceptance checks on soil enquiries (i.e. review of the waste description, analysis etc) will exclude soils deemed to pose an odour nuisance. However, whilst this conservative approach has been shown on the Applicant's other operational site to be effective there are occasional loads that will have a detectable odour where mitigation measures will need to be implemented to prevent odours from leaving the immediate boundary of the STF.

6.1.2 To ensure odours are kept to a minimum during the initial reception of waste, each load of waste will be inspected on delivery to ensure the waste conforms to the waste description initially provided by the producer. Any non-conforming waste, including malodorous wastes, will be either removed from the site, or subject to on-site odour mitigation. On-site mitigation measures will only be implemented if that mitigation method is known to be entirely effective in preventing odours from affecting the identified receptors.

6.1.3 Waste types with the following waste codes have been identified by the EA as being potentially malodourous and so will be audited at the source to assess their odour potential, prior to being granted approval to supply the site with material. These waste streams will also be screened upon arrival to the site to identify any potentially malodourous emissions that could potentially give rise to odour complaints:

- 19 02 05; Filter cake
- 19 12 11; Hydrocarbon impacted wastes

6.1.4 Please also refer to Soil Reception Procedure in Appendix 1

6.1.5 Drop heights of all received waste will be minimised as far as practicable during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for odour release as a consequence of agitation.

Waste Treatment & Storage

6.1.6 The bioremediation process relies on continuous management of the materials temperature, moisture content and oxygen content in order to facilitate biodegradation under aerobic conditions. To maintain these optimal conditions and ensure odours are kept to a minimum during this stage of treatment the following procedures will be implemented:

- Installation of a biopile air extraction system, a network of perforated aeration pipes installed beneath the waste biopiles. These are linked to a vacuum blower system. An air/water separator is fitted within the collection system to remove liquid from the process air extracted from the biopile. The process water is pumped from the separators

via an automated pump with automatic level detection system to an enclosed process water tank for primary settlement and carbon filtration prior to discharge to foul sewer.

- The air extraction system is connected to a biofilter to capture and treat any extracted VOCs and volatile degradation products and reduce particulate and odour emissions. The biofilter comprises a moist and nutrient enhanced oversize compost medium filter covered with an impermeable tarpaulin. The biofilter has exhaust holes to allow gaseous emissions to be released.

- The air extraction system will be regularly monitored and maintained. The biofilter will be monitored for the following parameters on a monthly basis:
    - VOCs (including BTEX)
    - Speciated PAHs
    - TPH

- The air sample analysis will be undertaken before and after the biofilter to demonstrate that ~99% of monitored contaminants are continuously removed during the operation of the STF. The biofilter is operational 24 hours per day.

- The biofilter will also be regularly checked and maintained to ensure appropriate media particle size, temperature and moisture content. Equipment will be calibrated in accordance with manufacturer's instructions or as agreed with the Environment Agency. These procedures will maintain and effective air extraction system, reducing odour emissions and identifying any leaks or damage for repair. Compliance with this requirement will be demonstrated by the monthly biofilter monitoring and regular VOCs monitoring at the site.

6.1.7 Operational controls will be in place to ensure no turning of the biopiles with any potentially odorous soils is undertaken during high winds which could have the potential to increase odour emissions downwind.

6.1.8 Soil screening will only be undertaken on soils which have already been characterised to ensure that no odorous contaminants are present This is to ensure that any odorous contaminants are absent and that no odours can be generated as a result of the soil screening/hand picking process.

Bioremediation processes

6.1.9 Absence of oxygen during the bioremediation process could lead to anaerobic conditions developing within the soils, generating odorous compounds. To ensure this is minimised, optimum conditions are maintained to avoid anaerobic decomposition. This is regulated by carrying out routine monitoring to ensure oxygen levels are present at all times.

6.1.10 Biodegradation is optimised by maintaining a temperature in the biopiles of between 30°C and 40°C to ensure microflora are stimulated. The biopile Air Extraction System comprises of a network of perforated aeration piles installed beneath the waste biopiles which are connection to a vacuum system. The air extraction system is connected to a biofilter to capture and treat the degradation products and reduce particulate and odour emissions. The biofilter comprises a oversize compost filter with exhaust hole to allow gaseous emissions to be released.

6.1.11 Operational controls during the bioremediation process will be in place to ensure there is no turning of the biopiles during high winds blowing towards sensitive receptors (Loundfield Farm, c.495m E from the site boundary).

6.1.12 As part of the bioremediation process, extracted air is passed through a biofilter which removes odorous contaminants. The biofilter is maintained on a regular basis in line with manufacturers specifications to ensure optical conditions for the removal or odours/volatile organic compounds. Strict controls including maintaining ideal moisture and temperature conditions, nutrient concentrations, pH and matrix particle size for the biofilter are in place.

6.2 Control Measures - Abnormal Operating Scenarios

Equipment Breakdown or Malfunction

6.2.1 Breakdown of malfunction of the loading and screening equipment could potentially result in the material being left for extended periods of time (e.g. 1-2 days). The impact of this will depend on the length of time of the breakdown, the waste types and volume of waste being processed and weather conditions i.e. particularly high temperatures or prolonged periods of heavy rainfall etc.

Control Measure

6.2.2 In the event of a plant failure or malfunction, alternative earthmoving equipment is normally available immediately on site or from the adjacent landfill area. Where this is not the case, the equipment will be repaired, or replacement plant hired in as soon as practicable. In the event that the biopile blower equipment malfunctions, the material will continue to be managed to ensure odours do not develop until a replacement can be fitted or the repairs completed.

6.2.3 It is rare for the equipment to fail, based upon experience and the simplicity of the equipment used; repairs are generally completed within 24-48 hours due to the wide availability of replacement parts. Planned deliveries of waste will be managed during this period and postponed if necessary.

6.2.4 It needs to be noted that contaminated soils received at the site have a very low organic content and do not produce any significant level of secondary odours from anaerobic degradation processes. The contaminants present within the soil are deemed the source of any potential odour. During periods without active aeration, there is rarely, if ever additional odours noted. In addition, all soils at site are formed into managed stockpiles to reduce the exposed area for potential emissions as far as practicable in the event that aeration is interrupted for a short period of time.

6.2.5 All plant and equipment will be maintained and regularly serviced in accordance with the manufacturers recommendations and planned maintenance procedures to minimise breakdowns. Replacement plant, such as the 360 excavator will be available within 24-48 hours. Specialist equipment such as loaders or screening equipment are rarely deemed critical and will be replaced as soon as practicably possible.

6.2.6 Runoff from the treatment areas will be collected within a sealed drainage system which drains to the onsite enclosed collection tanks and is not directly discharged to the surrounding environment.

Biofilter Malfunction

6.2.7 Malfunction of the biofilter could result in potentially odorous emissions from the treatment process by allowing contaminated air to be released directly into the atmosphere.

Control Measure

6.2.8 In the event of a biofilter malfunction, remedial measures will be implemented immediately upon an odour being noted. The most likely cause of any increasing odour from the biofilter would be low moisture levels within the media, this can be corrected quickly via switching on the irrigation system.

6.2.9 If the source of odour is the presence of fissures within the matrix, effectively 'short circuiting' the biofilter media, then the biofilter can be immediately de-compacted/turned with on-site excavation plant and additional oversize compost added. Quick release nutrients would also be added during this operation to provide added reassurance that nutrient levels are not deficient.

6.2.10 To avoid malfunction, a regular inspection and service regime is always implemented to ensure the biofilter is operating effectively. Continuous monitoring ensures any odours from the biofilter are identified immediately and remediated promptly. There has never been a failure of the biofilter on the Applicants other site.

Acceptance of Malodourous Waste

6.2.11 Acceptance of a malodourous waste to the STF could result in the addition of inappropriate material to the biopiles, potentially resulting in odour complaints.

Control Measure

6.2.12 The reception of malodorous waste is avoided as far as practicable during pre-acceptance checks of soil analysis data, site visits to inspect soil stockpiles at the producer's sites etc to check for odour potential. However, even with these checks there is always the remote possibility of occasional loads having a detectable odour at the point of waste deposit.

6.2.13 In the event that a malodourous waste is deposited at the site, the waste will be identified at the point of reception. In the event that the odours cannot be mitigated, then the load will be immediately removed from site in accordance with the site's waste rejection procedure. The site manager will be notified of the occurrence and the source of the waste identified prior to formal notification to the EA of a material rejection.

6.2.14 Where soils with odours are deemed to be suitable for acceptance and odours can be easily mitigated then the following will be implemented in order of effectiveness:

1. Covering of load with a very thin layer of woodchip stored on site for treatment operations – this has been shown to be very effective in immediately mitigating odours. This has the advantage that woodchip addition is implemented as standard during treatment commencement.
2. Covering with non-odorous soil from a treatment batch currently being treated on site. This is effective but requires a source of non-odorous soil in close proximity to the odorous waste deposit.
3. Cover with a tarpaulin; whilst this is effective, it does have a number of potential health and safety implications and can be of limited use over larger stockpiles or during high winds where covering may not be possible or result in partial uncovering of a stockpile

6.2.15 Soils will then be placed on a biopile extraction pipe or treated by screening/hand picking as soon as the formal reception procedure has been completed.

Adverse Weather

6.2.16 Periods of adverse weather conditions including high rainfall leading to flooding, low / high temperatures, temperature inversions and high winds in the direction of sensitive receptors.

Control Measure

6.2.17 Following adverse weather conditions such as continued and persistent high winds towards the sensitive receptors operations can resume (screening and biopile movement) as soon as possible when favourable conditions are present. However, there is the remote possibility that operations will occasionally have to be undertaken during adverse weather conditions in order to minimise potential for increased impacts at a later date.

Process Failure

6.2.18 Breakdown of the process and failure to maintain optimum conditions resulting in anaerobic conditions developing within the biopiles, process material and/or final product. This could result from prolonged storage times, inadequate aeration, unsuitable waste material or final product not fully treated.

Control Measure

6.2.19 The use of experienced and competent staff and an ISO accredited set of formal procedures has meant that there has never been the possibility of a process failure incident at the Applicants other site. Any short term/replacement staff used on occasions will find it easy to implement effective control due to the use of a standard set of procedures that form the operations manual for the site. This is regularly audited and is accredited to ISO 9001, 14001 and 18001. COTC cover is continuous at the site.

6.3 Force Majeure and Odour

6.3.1 Unexpected circumstances such as a fire or explosion on site or an act of vandalism could trigger the release of discernible odours. Under these circumstances' odour related contingency measures will be covered as per this Odour Management Plan and will be dealt with as promptly as possible. Remediation and reporting procedures for the above are as required within the Permit.

6.4 Drainage

6.4.1 All surface waters which falls on the external waste piles will be collected by the sealed drainage system and pumped to the on-site holding tanks. The tanks are emptied, and waters disposed off at a suitable facility.

6.4.2 There are no direct releases of water off site. All drainage infrastructures will be inspected, maintained and repaired as necessary. The holding tanks provides an enclosed system which reduced the impact and release of odours from process and surface waters.

6.4.3 In all circumstances, regular housekeeping will be undertaken to minimise the spread of odorous residues. All site staff will be trained to identify any malodours from operations on site and conversant with odour control and management procedures.

6.5 Risk Assessments

6.5.1 An Amenity & Accidents Risk Assessment (ARA)is included with the permit variation under doc ref: 3982-CAU-XX-XX-RP-V-0303. The ARA details the risks to receptors and the management control and mitigation procedures in place to minimise the impact of hazards/emissions.

6.5.2 An Air Quality Impact Assessment for the proposed facility has been prepared by Airshed, the scope of the assessment was to consider the potential air quality impact on human health from the emissions of VOCs. It also considered that odour impacts from the proposed site activities are predicted to be negligible. A copy of the Air Quality Impact Assessment (AQIM) report has been included under Appendix 2 'AS 0732 Daneshill Soil Vapour Facility'.

6.5.3 A Flood Risk Assessment and Drainage Strategy (FRA) has been required in support of planning application for the STF under document ref: 3982-CAU-XX-XX-RP-V-0300. The FRA provides a site-specific flood risk assessment demonstration that the proposed development will be safe for its lifetime and taking into account the vulnerability of users without increasing flood risk elsewhere.

7.1 Complaints Procedure

7.1.1 Typically, complaints about the site are usually received via the Environment Agency, although FCC Recycling (UK) also deal with complaints received directly where necessary. In the event of a complaint being received the following can be implemented:

- Information can be provided to the local neighbours (via the Environment Agency) regarding the point and method of contact for the Facility in the event an odour has been detected or they want to discuss any activities etc at the Facility.
- The neighbours can be advised that any complaints / concerns will be addressed immediately following identification/notification and contingency action implemented.
- The neighbours can be advised of any corrective action and a follow up call carried out if required.

7.1.2 The Operator will continue to maintain a routine liaison with the Environment Agency regarding odour nuisance. In the event of odour complaint being received by the EA the complaint is passed to the Operator for the investigation. Every complaint will be recorded on Operators system as below:

- All complaints are recorded by the site manager or site staff on the FCC 'Safeguard' online incident recording system, describing the complaint and severity
- Where this is not practicable; an odour complaint form will be completed, and cross referenced to the validation report & complaints log (As per the Sites Management System)
- The complaint can be forwarded to the Regional Environment Manager to undertake further investigation
- Depending on the severity, the complaint can be escalated to senior management for investigation if necessary
- The system is a digitalised process and records a wide range of reporting

7.1.3 The odour investigation procedure will also include the following elements:

- Site walk-over coupled with olfactory monitoring along the site boundary assessment of the site operations which took place prior to and at the time of the complaint in relation to their odour potential and other on-site sources of odours;
- Monitoring will be carried out walking around the operational perimeter;
- Assessment of the weather conditions prior to and at the time of the complaint.
- A suitably trained person who is familiar with the site conditions and the 'sniff-testing' monitoring technique will carry out odour investigations at the site. In the event of a substantiated complaint being received, then mitigation measures will be used for the areas/activities which were cause of the particular odour event (Section 6.3)

7.1.4 A follow up report on the investigation will be issued to the EA if the complaint is found to be substantiated and if requested, to the Local Authority. The report will identify improvements proposed to reduce the potential for future complaints. Any new recommendations will then be incorporated in the Odour Management Plan and the operating procedures.

8.1 Schedule

8.1.1 Odour monitoring will be undertaken in order to assess how successful the operational management and mitigating control measures are at the STF and to identify if necessary whether odour is causing a potential nuisance to ensure that appropriate remediation measures are adopted early. Olfactory Odour monitoring will be coupled with a site walk-over along the site boundary assessment of the site operational activities.

8.1.2 Monitoring will be undertaken by designated staff that will be fully trained by Site management. All site personnel will be responsible for reporting any problem odours identified during their day to day operations.

8.1.3 Details of monitoring thresholds, limits and frequencies are included in the Emissions Management Plan within Document ref: 3982-CAU-XX-XX-RP-V-0307. Monitoring at the Facility will consist of the following;:

Parameter	Monitoring Technique	Frequency
Meteorological Monitoring	Local weather information	Manually checked at start of each working day and logged
Olfactory Monitoring	STF perimeter. Off Site checks (towards the identified sensitive receptors in event of odours from the STF detected at boundary or following a complaint	Daily (or more frequently following odour complaints)
Biofilter Monitoring	VOCs (including BTEX) Speciated PAHs TPH Photo ionization detector (PID)	Monthly Bi-monthly
Complaints Monitoring	Logged in accordance with Complaints procedure	Ad-Hoc

8.2 Meteorological Monitoring

8.2.1 The nearest weather station will be utilised for meteorological monitoring at the STF and will as a minimum include monitoring for wind speed, direction, precipitation, rainfall, temperature etc.

8.2.2 Weather conditions will be noted at a time of an odour survey and assessed in terms of any odour effects beyond the site boundary. This would indicate which local receptors lie downwind of the site. The following weather conditions are considered to be unfavourable with regard to the effects of the potential odour emissions and should be considered when assessing odour events:

- Weather conditions, especially wind speed and direction, are important factors which influence odour dispersion. Stronger winds (>6m/s) reduce the impact of odours due to greater dilution and dispersion than lighter winds, whereas wind direction determines the direction of odour dispersion.
- The greatest risk of poor odour dispersion tends to occur on cool nights, with low wind speed, during anti-cyclonal conditions and in the presence of a temperature inversion. These conditions often happen during the cold part of the year and can result in odours being transported over long distances from the source.
- Calm weather spells (wind speed <0.1m/s) results in omni-directional dispersion of odours from the site as it is regulated largely by diffusion in the air. Under such conditions, all locations directly adjacent to the source would be expected to be impacted by fugitive emissions.

8.2.3 In the event of odour complaints, the data enables complaints to be assessed against the meteorological conditions for the relevant period. Meteorological information will be recorded on the Safeguard system which is logged internally and sent to the EA.

8.3 Olfactory Monitoring

8.3.1 As part of the daily inspections, appropriately trained and experienced Site personnel will carry out olfactory monitoring off site around the site activity perimeter boundary. Additional locations for monitoring may also be included, depending on the frequency and location of any complaints received at the Facility (i.e. olfactory monitoring outside of the permit boundary at sensitive receptor locations).

8.3.2 The monitoring results will be recorded on the Site Daily Inspection Sheet, which forms part of the Site's Management System.

8.3.3 Olfactory monitoring will be carried out in accordance with the recommendations detailed in the EA H4 guidance, including avoiding strong foods or drinks and strongly scented deodorisers or toiletries etc for at least half an hour prior to the monitoring. In addition, individuals suffering from a cold, sore throat or sinus problems that may impair their ability to detect odours will not be used.

8.3.4 The designated person will exit their vehicle and remain in the locality for a minimum of 1 minute whilst breathing normally. Any external activities that may contribute to odour generation in the surrounding area will also be noted on the form and an assessment of the intensity of the odour will be made using the key provided. The routine monitoring points have already been assessed for sensitivity, but should any additional locations be used the sensitivity will be entered using the key provided.

8.3.5 In the event odour is detected above intensity ranking 3 (moderate odour), the Facility management will be informed immediately, and the approximate location and extent of the odour plume assessed, and site operations reviewed and remediated.

8.4 Complaints Monitoring

8.4.1 Any complaints received directly by the operator or via the Regulatory bodies, including the EA and Local Authority, will be recorded on the operator's system. Investigation will then be undertaken via olfactory monitoring at the location of the complaint and on site to substantiate the extent and location of the plume and the source of the odour will be identified.

8.4.2 If necessary, monitoring will also be carried out at the nearest sensitive receptors to the Facility and the monitoring results recorded.

9.1.1 Following receipt of a complaint or identification of an odour at the Facility, the following action plan will be undertaken, including:

- Implementation of the mitigation measures as detailed in Section 6.2.
- Olfactory monitoring to assess the effectiveness of the mitigation measures employed.
- Additional olfactory monitoring as detailed above to identify the extent of the odour plume and potential cause for the odour i.e. waste material and / or process activity.
- Examination of the operational activities at the Facility at the time of the odour complaint or odour identification
- Examination of the meteorological conditions at the time of the complaint or odour identification
- Examination of the process conditions i.e. temperature and moisture content of the process piles, length of storage etc.
- Carry out a review of the operational procedure and process controls and instigate any control measures immediately following identification of the problem.

9.1.2 Further olfactory monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

9.2 Record Keeping and Reporting

9.2.1 The procedure for recording will be undertaken as detailed above. All information is recorded digitally and maintained within a digital database. All information can be accessed via a computer within the Site office and will be made available to the Environment Agency on request. This record keeping already forms part of the Management System.

9.3 OMP Review

9.3.1 This OMP will be reviewed on a regular basis or following receipt of a significant substantiated complaint that requires a change in management procedures for the STF.

Drawing

Appendix 1

Appendix 2

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Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Odour Management Plan

Prepared by:

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Document Reference: 3982-CAU-XX-XX-RP-V-0308.A0.C2

September 2021

APPROVAL RECORD

Site:	**Daneshill Soils Treatment Facility**
Client:	**FCC Recycling (UK) Limited**
Project Title:	**Environmental Permit Variation**
Document Title:	**Odour Management Plan**
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Approved	Andy Stocks	**Date**	15/01/2021
Revised	Kellie-Marie P. Burston	**Date**	29/09/2021

DISCLAIMER

ODOUR MANAGEMENT PLAN

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1.1 Report context

1.1.1 FCC Recycling (UK) Ltd (hereafter referred to as the 'Operator') operate Daneshill Landfill Site, which is located approximately 2km east of Lound Village, Nottinghamshire at National Grid Reference SK6755086750.

1.1.2 Caulmert Limited were appointed by the operator to prepare an application to vary the existing permit: EPR/NP3538MF to include a Soil Treatment Facility (STF) which will operate on a newly constructed compost pad within the landfill site boundary. In addition to the STF, the Operator proposes a number of variations to add the following listed activities to the current permit:

- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.1.3 In addition to the details above, this odour management plan (OMP) has also been written to support a planning application whereby a Scoping Opinion request for the Soil Treatment Facility was made by Barton Wilmore in October 2019. A reply was received on 12th November 2019 from the Waste Planning Authority (WPA), Nottingham Council. The Scoping Opinion established that the proposed development was not in a sensitive area, although it exceeded 0.5ha in plan area and therefore is required to be assessed for any significant effects on the environment, including odour. The Operator are required to submit an OMP to consider the impact of odour on receptors as a result of the construction and operational activities of the STF. This OMP provides means of assessing the effectiveness of control measures. The proposed Odour Action Plan should be implemented in cases of failure and odour events. This document looks at current procedures for investigating odour events and includes reference information on the understanding of odour nuisance.

1.1.4 The OMP has been prepared in reference to the Environments Agency's Technical Guidance Note H4 Horizontal Guidance for Odour[1] and the recommended Best Available Techniques (BAT) for odour control at waste management facilities.

[1] Environment Agency. March 2011. Technical Guidance Note IPPC H4 Horizontal Guidance for Odour (Parts 1 & 2).

1.2 Standards and Guidance Relating to Odour Nuisances

1.2.1 There are no statutory standards for odour, currently the Environment Agency have published their guidance, Environmental Permitting: H4 Odour Management.

1.2.2 This guidance makes relevance to measures necessary to prevent or minimise odour pollution (if prevention is not practicable). Where appropriate measures to take will depend on the industry sector and site-specific circumstances with reference to costs and benefits.

1.2.3 There are two distinct types of odour nuisance covered under UK legislation: 'statutory nuisance' and 'odour nuisance likely to cause a loss of amenity', with the main legislation in respect of odour generation being the Environmental Protection Act (EPA) 1990.

1.2.4 Enforcement of the Act (in regard to nuisance), is currently under the jurisdiction of the EA, Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance.

1.2.5 Whilst there are no European or UK specific regulatory standards for the assessment of the impact of odours. It can be reasonably argued that loss of amenity and complaints are likely to occur when odours become detectable and recognisable. To be a statutory nuisance the odour needs to be seen to be affecting the comfort or enjoyment of the complainant's property or the public at large and the source of the odour also needs to be beyond reasonable doubt.

1.3 Soil Treatment Operations

1.3.1 The STF is proposed to accept and process a maximum 29,999 tonnes per annum of hazardous soils containing visible bound pieces of asbestos and/or hydrocarbons and 20,001 of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The usual maximum treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks. The STF will operate within the footprint of the Daneshill Landfill Site permit as shown in drawing ref; 4239-CAU-XX-XX-DR-V-1804.

1.3.2 The treatment areas consist of 2 treatment pads measuring at 3000m^2 and 3000m^2 for biotreatment/physical treatment and another 1 x 4000m^2 treatment pad solely for screening/processing. An indicative operational layout of the treatment and processing area and cross section is detailed in drawing refs 3982-CAU-XX-XX-DR-V-1805, 3982-CAU-XX-XX-DR-V-1806 and 3982-CAU-XX-XX-DR-V-1807.

<u>Bioremediation Process Description</u>

1.3.3 The biological treatment process varies between 8 to 16 weeks, dependent on the contaminants present in the soil.

1.3.4 Bioremediation of soils will be undertaken on a newly constructed geo-composite clay lined crushed treatment pad with sealed drainage to holding tanks. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully.

As there is no drainage network on site, all process waters will be pumped to on-site holding tanks with excess water tankered off to an appropriate disposal facility.

1.3.5 Soils accepted at the STF are deposited by tipper lorry on the treatment areas. The soils are arranged into stockpiles for initial testing to ensure compliance with the client's waste description, these are managed using a system of batches/lots which allows the waste to be categorised by age and trackable from the point of origin to its location on the treatment pad and subsequent treatment.

1.3.6 Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

1.3.7 Biodegradation of the organic contaminants is carried out by microorganisms in the soil. This can be enhanced by addition of very low concentrations of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Management of moisture content is also essential for microbial activity; low moisture content will inhibit microbial growth, but excessive moisture can restrict airflow. The perforated aeration pipes located beneath the waste will extract air from the biopile to effectively control soil oxygen levels and moisture content to maintain aerobic conditions (i.e. oxygen levels >10%).

1.3.8 Temperature in the biopiles is maintained between 30 and 40°C to ensure the mesophilic microflora are predominately stimulated, optimising biodegradation.

1.3.9 The stages of the bioremediation process are detailed below:

- Initial Placement: The soil deposited on the treatment pad will be formed into a biopile by a 360 excavator.
- Addition of Nutrients: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.
- Chemical Analysis – Approximately every 4 weeks the soil is analysed for contaminant concentrations to determine whether the biological treatment of the soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process.
- Nutrients testing – Every 2-4 weeks the soil is analysed for nutrient levels within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process. This is supported by the chemical analysis of the soil for contaminant concentrations.
- De-compaction of the soil – Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil.

- Validation testing: Once the soil meets the re-use criteria, the soil is removed from the treatment pad and transferred to the non-hazardous soils storage area or directly to the landfill.

1.3.10 On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent landfill void or reused on site as restoration soils. The treated soils are stored externally as shown on Site Layout Plan, pending disposal or removal off-site

Asbestos Treatment Process Description

1.3.11 The processing of soils with asbestos debris is predominantly undertaken on soils with no volatile or potentially odorous inclusions.

1.3.12 Soil is initially received by tipper lorry and placed on the treatment pad and sampled to ensure the client's initial waste description is correct. Whilst the results are awaited the soils are sheeted to prevent wind borne dust or any odour emissions from occurring.

1.3.13 Soils with no potential for odours will be subject to screening and asbestos picking as stated within the operating techniques for the permit.

1.3.14 Soils with the potential for odours will be assessed further to establish if screening or hand picking will give rise to odours that can be detected at the site boundary. If odours are deemed possible at the site boundary as a result of screening or hand picking then the soils will be rejected from site. There will be no acceptance of soils at the site that would give rise to odours during the asbestos screening and picking treatment works.

1.4 Air Quality Impact Assessment

1.4.1 An air quality impact assessment (AQIA) was undertaken for the proposed development. The scope of the assessment was to consider the potential air quality impacts on human health from the emissions of VOCs.

1.4.2 With respect to odour, the report concluded that:

"The predicted odour at the nearest sensitive receptors are well below the odour detection threshold for all pollutants".

3.1 Sources

3.1.1 The contaminated soils accepted on site may contain odorous substances, it is considered that the asbestos element in asbestos containing soils is unlikely to be a source of odour, however the soils could present an odour source. Odour may present a nuisance to surrounding human receptors or cause an adverse impact to the environment.

3.1.2 The current and proposed activities associated with the STF that have the potential to produce odorous emissions are:

- Delivery of waste to site and deposit onto the treatment pad and initial pre-acceptance assessment;
- Bioremediation of potentially contaminated soils including initial formation, aeration and turning;
- Biopile emissions via biofilter and/or treatment of surface waters
- Screening and hand picking of soils; and,
- Storage and transfer of residual material removed from screening process.

3.1.3 Soils accepted for treatment can potentially contain odorous organic substances due to the presence of the following hydrocarbons:

- range of petroleum hydrocarbons (petrol, heating fuel, diesel, used oils, crude oil etc.);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- creosote;
- phenols; and
- chlorinated solvents and other Volatile Organic Compounds (VOCs).

3.1.4 The wastes types to be accepted at Site are set out in within the Permit Application. Odorous contaminants known to be difficult to either; treat to a level with no residual odour (e.g. chlorinated phenols), or effectively control/eliminate odours from, will not be accepted for treatment.

3.1.5 During biotreatment, the optimum temperature, oxygen and moisture conditions for the treatment process will be maintained to reduce the odour emissions potential. An absence of sufficient oxygen within the piles may lead to the biodegradation of the material under anaerobic conditions, increasing the potential for malodourous emissions. The current bioremediation method maintains optimum aerobic conditions in the waste by continuously extracting air through the soil to ensure consistently aerobic conditions to be maintained with optimal oxygen levels. This allows optimal contaminant mineralisation to take place.

3.1.6 Extracted air is passed through a biofilter to remove odorous contaminants. This filter operates continuously and removes approximately 99% of the monitored volatile organic contaminants that have the potential to cause odour. An Emissions Management Plan (Document ref: 3982-CAU-XX-XX-RP-V-0307) is in place with details on monitoring on site to confirm the effectiveness of the biofilter process.

4.1 Meteorological conditions

4.1.1 It is considered that the principle mechanism for the transit of odour emissions from site activities to nearby sensitive receptors is likely to be via airborne. Meteorological conditions will heavily impact and determine the level of risk and exposure to sensitive receptors. The following factors are likely to influence the risk:

Wind Direction & speed

4.1.2 The dominant wind direction determines which receptors are likely to be impacted and levels of exposure. Wind speed will affect the likely distances odours can be transported, however, in contracts increased wind speed is likely to dissipate odours.

Ambient air temperatures

4.1.3 Higher temperatures and warmer conditions can result in an increased risk of odour emissions from site. Staff will be trained to be vigilant of meteorological conditions and those likely to encourage odour emissions.

5 POTENTIAL RECEPTORS

5.1 Local Sensitive Receptors

5.1.1 The Site is centred on national grid reference SK6764786722 within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. The location of the proposed activity relative to the surrounding area is shown in the Site Location Plan drawing ref; 3982-CAU-XX-XX-DR-V-1801.

5.1.2 The proposed STF site is in a predominantly agricultural setting of which Loundfield Farm is located 500m to the east. Other nearby residential and domestic dwellings include a few properties and a travellers site located on Daneshill Road. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

5.1.3 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

5.1.4 A review of the prevailing wind direction has identified that the most dominant wind is from the south-west/south-south-west towards north-east/north-north-east. The wind direction is likely to blow towards Mattersey Village and agricultural fields. Given the distance from the site boundary and the transient nature of odours from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

5.1.5 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

5.1.6 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

5.1.7 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

5.1.8 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Traveller's Site	Residential	155m	SWS
Daneshill Road	Public road	250-500m	S, W, SW
Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E
Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

5.1.9 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

5.1.10 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

5.1.11 The site is not located within a flood risk zone.

6.1 General Control Measures

Waste Acceptance

6.1.1 In general, the pre-acceptance checks on soil enquiries (i.e. review of the waste description, analysis etc) will exclude soils deemed to pose an odour nuisance. However, whilst this conservative approach has been shown on the Applicant's other operational site to be effective there are occasional loads that will have a detectable odour where mitigation measures will need to be implemented to prevent odours from leaving the immediate boundary of the STF.

6.1.2 To ensure odours are kept to a minimum during the initial reception of waste, each load of waste will be inspected on delivery to ensure the waste conforms to the waste description initially provided by the producer. Any non-conforming waste, including malodorous wastes, will be either removed from the site, or subject to on-site odour mitigation. On-site mitigation measures will only be implemented if that mitigation method is known to be entirely effective in preventing odours from affecting the identified receptors.

6.1.3 Waste types with the following waste codes have been identified by the EA as being potentially malodourous and so will be audited at the source to assess their odour potential, prior to being granted approval to supply the site with material. These waste streams will also be screened upon arrival to the site to identify any potentially malodourous emissions that could potentially give rise to odour complaints:

- 19 02 05; Filter cake
- 19 12 11; Hydrocarbon impacted wastes

6.1.4 Please also refer to Soil Reception Procedure in Appendix 1

6.1.5 Drop heights of all received waste will be minimised as far as practicable during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for odour release as a consequence of agitation.

Waste Treatment & Storage

6.1.6 The bioremediation process relies on continuous management of the materials temperature, moisture content and oxygen content in order to facilitate biodegradation under aerobic conditions. To maintain these optimal conditions and ensure odours are kept to a minimum during this stage of treatment the following procedures will be implemented:

- Installation of a biopile air extraction system, a network of perforated aeration pipes installed beneath the waste biopiles. These are linked to a vacuum blower system. An air/water separator is fitted within the collection system to remove liquid from the process air extracted from the biopile. The process water is pumped from the separators

via an automated pump with automatic level detection system to an enclosed process water tank for primary settlement and carbon filtration prior to discharge to foul sewer.

- The air extraction system is connected to a biofilter to capture and treat any extracted VOCs and volatile degradation products and reduce particulate and odour emissions. The biofilter comprises a moist and nutrient enhanced woodchip medium filter covered with an impermeable tarpaulin. The biofilter has exhaust holes to allow gaseous emissions to be released.

- The air extraction system will be regularly monitored and maintained. The biofilter will be monitored for the following parameters on a monthly basis:
    - VOCs (including BTEX)
    - Speciated PAHs
    - TPH

- The air sample analysis will be undertaken before and after the biofilter to demonstrate that ~99% of monitored contaminants are continuously removed during the operation of the STF. The biofilter is operational 24 hours per day.

- The biofilter will also be regularly checked and maintained to ensure appropriate media particle size, temperature and moisture content. Equipment will be calibrated in accordance with manufacturer's instructions or as agreed with the Environment Agency. These procedures will maintain and effective air extraction system, reducing odour emissions and identifying any leaks or damage for repair. Compliance with this requirement will be demonstrated by the monthly biofilter monitoring and regular VOCs monitoring at the site.

6.1.7 Operational controls will be in place to ensure no turning of the biopiles with any potentially odorous soils is undertaken during high winds which could have the potential to increase odour emissions downwind.

6.1.8 Soil screening will only be undertaken on soils which have already been characterised to ensure that no odorous contaminants are present This is to ensure that any odorous contaminants are absent and that no odours can be generated as a result of the soil screening/hand picking process.

Bioremediation processes

6.1.9 Absence of oxygen during the bioremediation process could lead to anaerobic conditions developing within the soils, generating odorous compounds. To ensure this is minimised, optimum conditions are maintained to avoid anaerobic decomposition. This is regulated by carrying out routine monitoring to ensure oxygen levels are present at all times.

6.1.10 Biodegradation is optimised by maintaining a temperature in the biopiles of between 30°C and 40°C to ensure microflora are stimulated. The biopile Air Extraction System comprises of a network of perforated aeration piles installed beneath the waste biopiles which are connection to a vacuum system. The air extraction system is connected to a biofilter to capture and treat the degradation products and reduce particulate and odour emissions. The biofilter comprises a woodchip filter with exhaust hole to allow gaseous emissions to be released.

6.1.11 Operational controls during the bioremediation process will be in place to ensure there is no turning of the biopiles during high winds blowing towards sensitive receptors (Loundfield Farm, c.495m E from the site boundary).

6.1.12 As part of the bioremediation process, extracted air is passed through a biofilter which removes odorous contaminants. The biofilter is maintained on a regular basis in line with manufacturers specifications to ensure optical conditions for the removal or odours/volatile organic compounds. Strict controls including maintaining ideal moisture and temperature conditions, nutrient concentrations, pH and matrix particle size for the biofilter are in place.

6.2 Control Measures - Abnormal Operating Scenarios

Equipment Breakdown or Malfunction

6.2.1 Breakdown of malfunction of the loading and screening equipment could potentially result in the material being left for extended periods of time (e.g. 1-2 days). The impact of this will depend on the length of time of the breakdown, the waste types and volume of waste being processed and weather conditions i.e. particularly high temperatures or prolonged periods of heavy rainfall etc.

Control Measure

6.2.2 In the event of a plant failure or malfunction, alternative earthmoving equipment is normally available immediately on site or from the adjacent landfill area. Where this is not the case, the equipment will be repaired, or replacement plant hired in as soon as practicable. In the event that the biopile blower equipment malfunctions, the material will continue to be managed to ensure odours do not develop until a replacement can be fitted or the repairs completed.

6.2.3 It is rare for the equipment to fail, based upon experience and the simplicity of the equipment used; repairs are generally completed within 24-48 hours due to the wide availability of replacement parts. Planned deliveries of waste will be managed during this period and postponed if necessary.

6.2.4 It needs to be noted that contaminated soils received at the site have a very low organic content and do not produce any significant level of secondary odours from anaerobic degradation processes. The contaminants present within the soil are deemed the source of any potential odour. During periods without active aeration, there is rarely, if ever additional odours noted. In addition, all soils at site are formed into managed stockpiles to reduce the exposed area for potential emissions as far as practicable in the event that aeration is interrupted for a short period of time.

6.2.5 All plant and equipment will be maintained and regularly serviced in accordance with the manufacturers recommendations and planned maintenance procedures to minimise breakdowns. Replacement plant, such as the 360 excavator will be available within 24-48 hours. Specialist equipment such as loaders or screening equipment are rarely deemed critical and will be replaced as soon as practicably possible.

6.2.6 Runoff from the treatment areas will be collected within a sealed drainage system which drains to the onsite enclosed collection tanks and is not directly discharged to the surrounding environment.

Biofilter Malfunction

6.2.7 Malfunction of the biofilter could result in potentially odorous emissions from the treatment process by allowing contaminated air to be released directly into the atmosphere.

Control Measure

6.2.8 In the event of a biofilter malfunction, remedial measures will be implemented immediately upon an odour being noted. The most likely cause of any increasing odour from the biofilter would be low moisture levels within the media, this can be corrected quickly via switching on the irrigation system.

6.2.9 If the source of odour is the presence of fissures within the matrix, effectively 'short circuiting' the biofilter media, then the biofilter can be immediately de-compacted/turned with on-site excavation plant and additional woodchip added. Quick release nutrients would also be added during this operation to provide added reassurance that nutrient levels are not deficient.

6.2.10 To avoid malfunction, a regular inspection and service regime is always implemented to ensure the biofilter is operating effectively. Continuous monitoring ensures any odours from the biofilter are identified immediately and remediated promptly. There has never been a failure of the biofilter on the Applicants other site.

Acceptance of Malodourous Waste

6.2.11 Acceptance of a malodourous waste to the STF could result in the addition of inappropriate material to the biopiles, potentially resulting in odour complaints.

Control Measure

6.2.12 The reception of malodorous waste is avoided as far as practicable during pre-acceptance checks of soil analysis data, site visits to inspect soil stockpiles at the producer's sites etc to check for odour potential. However, even with these checks there is always the remote possibility of occasional loads having a detectable odour at the point of waste deposit.

6.2.13 In the event that a malodourous waste is deposited at the site, the waste will be identified at the point of reception. In the event that the odours cannot be mitigated, then the load will be immediately removed from site in accordance with the site's waste rejection procedure. The site manager will be notified of the occurrence and the source of the waste identified prior to formal notification to the EA of a material rejection.

6.2.14 Where soils with odours are deemed to be suitable for acceptance and odours can be easily mitigated then the following will be implemented in order of effectiveness:

1. Covering of load with a very thin layer of woodchip stored on site for treatment operations – this has been shown to be very effective in immediately mitigating odours. This has the advantage that woodchip addition is implemented as standard during treatment commencement.
2. Covering with non-odorous soil from a treatment batch currently being treated on site. This is effective but requires a source of non-odorous soil in close proximity to the odorous waste deposit.
3. Cover with a tarpaulin; whilst this is effective, it does have a number of potential health and safety implications and can be of limited use over larger stockpiles or during high winds where covering may not be possible or result in partial uncovering of a stockpile

6.2.15 Soils will then be placed on a biopile extraction pipe or treated by screening/hand picking as soon as the formal reception procedure has been completed.

Adverse Weather

6.2.16 Periods of adverse weather conditions including high rainfall leading to flooding, low / high temperatures, temperature inversions and high winds in the direction of sensitive receptors.

Control Measure

6.2.17 Following adverse weather conditions such as continued and persistent high winds towards the sensitive receptors operations can resume (screening and biopile movement) as soon as possible when favourable conditions are present. However, there is the remote possibility that operations will occasionally have to be undertaken during adverse weather conditions in order to minimise potential for increased impacts at a later date.

Process Failure

6.2.18 Breakdown of the process and failure to maintain optimum conditions resulting in anaerobic conditions developing within the biopiles, process material and/or final product. This could result from prolonged storage times, inadequate aeration, unsuitable waste material or final product not fully treated.

Control Measure

6.2.19 The use of experienced and competent staff and an ISO accredited set of formal procedures has meant that there has never been the possibility of a process failure incident at the Applicants other site. Any short term/replacement staff used on occasions will find it easy to implement effective control due to the use of a standard set of procedures that form the operations manual for the site. This is regularly audited and is accredited to ISO 9001, 14001 and 18001. COTC cover is continuous at the site.

6.3 Force Majeure and Odour

6.3.1 Unexpected circumstances such as a fire or explosion on site or an act of vandalism could trigger the release of discernible odours. Under these circumstances' odour related contingency measures will be covered as per this Odour Management Plan and will be dealt with as promptly as possible. Remediation and reporting procedures for the above are as required within the Permit.

6.4 Drainage

6.4.1 All surface waters which falls on the external waste piles will be collected by the sealed drainage system and pumped to the on-site holding tanks. The tanks are emptied, and waters disposed off at a suitable facility.

6.4.2 There are no direct releases of water off site. All drainage infrastructures will be inspected, maintained and repaired as necessary. The holding tanks provides an enclosed system which reduced the impact and release of odours from process and surface waters.

6.4.3 In all circumstances, regular housekeeping will be undertaken to minimise the spread of odorous residues. All site staff will be trained to identify any malodours from operations on site and conversant with odour control and management procedures.

6.5 Risk Assessments

6.5.1 An Amenity & Accidents Risk Assessment (ARA)is included with the permit variation under doc ref: 3982-CAU-XX-XX-RP-V-0303. The ARA details the risks to receptors and the management control and mitigation procedures in place to minimise the impact of hazards/emissions.

6.5.2 An Air Quality Impact Assessment for the proposed facility has been prepared by Airshed, the scope of the assessment was to consider the potential air quality impact on human health from the emissions of VOCs. It also considered that odour impacts from the proposed site activities are predicted to be negligible. A copy of the Air Quality Impact Assessment (AQIM) report has been included under Appendix 2 'AS 0732 Daneshill Soil Vapour Facility'.

6.5.3 A Flood Risk Assessment and Drainage Strategy (FRA) has been required in support of planning application for the STF under document ref: 3982-CAU-XX-XX-RP-V-0300. The FRA provides a site-specific flood risk assessment demonstration that the proposed development will be safe for its lifetime and taking into account the vulnerability of users without increasing flood risk elsewhere.

7.1 Complaints Procedure

7.1.1 Typically, complaints about the site are usually received via the Environment Agency, although FCC Recycling (UK) also deal with complaints received directly where necessary. In the event of a complaint being received the following can be implemented:

- Information can be provided to the local neighbours (via the Environment Agency) regarding the point and method of contact for the Facility in the event an odour has been detected or they want to discuss any activities etc at the Facility.
- The neighbours can be advised that any complaints / concerns will be addressed immediately following identification/notification and contingency action implemented.
- The neighbours can be advised of any corrective action and a follow up call carried out if required.

7.1.2 The Operator will continue to maintain a routine liaison with the Environment Agency regarding odour nuisance. In the event of odour complaint being received by the EA the complaint is passed to the Operator for the investigation. Every complaint will be recorded on Operators system as below:

- All complaints are recorded by the site manager or site staff on the FCC 'Safeguard' online incident recording system, describing the complaint and severity
- Where this is not practicable; an odour complaint form will be completed, and cross referenced to the validation report & complaints log (As per the Sites Management System)
- The complaint can be forwarded to the Regional Environment Manager to undertake further investigation
- Depending on the severity, the complaint can be escalated to senior management for investigation if necessary
- The system is a digitalised process and records a wide range of reporting

7.1.3 The odour investigation procedure will also include the following elements:

- Site walk-over coupled with olfactory monitoring along the site boundary assessment of the site operations which took place prior to and at the time of the complaint in relation to their odour potential and other on-site sources of odours;
- Monitoring will be carried out walking around the operational perimeter;
- Assessment of the weather conditions prior to and at the time of the complaint.
- A suitably trained person who is familiar with the site conditions and the 'sniff-testing' monitoring technique will carry out odour investigations at the site. In the event of a substantiated complaint being received, then mitigation measures will be used for the areas/activities which were cause of the particular odour event (Section 6.3)

7.1.4 A follow up report on the investigation will be issued to the EA if the complaint is found to be substantiated and if requested, to the Local Authority. The report will identify improvements proposed to reduce the potential for future complaints. Any new recommendations will then be incorporated in the Odour Management Plan and the operating procedures.

8.1 Schedule

8.1.1 Odour monitoring will be undertaken in order to assess how successful the operational management and mitigating control measures are at the STF and to identify if necessary whether odour is causing a potential nuisance to ensure that appropriate remediation measures are adopted early. Olfactory Odour monitoring will be coupled with a site walk-over along the site boundary assessment of the site operational activities.

8.1.2 Monitoring will be undertaken by designated staff that will be fully trained by Site management. All site personnel will be responsible for reporting any problem odours identified during their day to day operations.

8.1.3 Details of monitoring thresholds, limits and frequencies are included in the Emissions Management Plan within Document ref: 3982-CAU-XX-XX-RP-V-0307. Monitoring at the Facility will consist of the following;:

Parameter	Monitoring Technique	Frequency
Meteorological Monitoring	Local weather information	Manually checked at start of each working day and logged
Olfactory Monitoring	STF perimeter. Off Site checks (towards the identified sensitive receptors in event of odours from the STF detected at boundary or following a complaint	Daily (or more frequently following odour complaints)
Biofilter Monitoring	VOCs (including BTEX) Speciated PAHs TPH Photo ionization detector (PID)	Monthly Bi-monthly
Complaints Monitoring	Logged in accordance with Complaints procedure	Ad-Hoc

8.2 Meteorological Monitoring

8.2.1 The nearest weather station will be utilised for meteorological monitoring at the STF and will as a minimum include monitoring for wind speed, direction, precipitation, rainfall, temperature etc.

8.2.2 Weather conditions will be noted at a time of an odour survey and assessed in terms of any odour effects beyond the site boundary. This would indicate which local receptors lie downwind of the site. The following weather conditions are considered to be unfavourable with regard to the effects of the potential odour emissions and should be considered when assessing odour events:

- Weather conditions, especially wind speed and direction, are important factors which influence odour dispersion. Stronger winds (>6m/s) reduce the impact of odours due to greater dilution and dispersion than lighter winds, whereas wind direction determines the direction of odour dispersion.
- The greatest risk of poor odour dispersion tends to occur on cool nights, with low wind speed, during anti-cyclonal conditions and in the presence of a temperature inversion. These conditions often happen during the cold part of the year and can result in odours being transported over long distances from the source.
- Calm weather spells (wind speed <0.1m/s) results in omni-directional dispersion of odours from the site as it is regulated largely by diffusion in the air. Under such conditions, all locations directly adjacent to the source would be expected to be impacted by fugitive emissions.

8.2.3 In the event of odour complaints, the data enables complaints to be assessed against the meteorological conditions for the relevant period. Meteorological information will be recorded on the Safeguard system which is logged internally and sent to the EA.

8.3 Olfactory Monitoring

8.3.1 As part of the daily inspections, appropriately trained and experienced Site personnel will carry out olfactory monitoring off site around the site activity perimeter boundary. Additional locations for monitoring may also be included, depending on the frequency and location of any complaints received at the Facility (i.e. olfactory monitoring outside of the permit boundary at sensitive receptor locations).

8.3.2 The monitoring results will be recorded on the Site Daily Inspection Sheet, which forms part of the Site's Management System.

8.3.3 Olfactory monitoring will be carried out in accordance with the recommendations detailed in the EA H4 guidance, including avoiding strong foods or drinks and strongly scented deodorisers or toiletries etc for at least half an hour prior to the monitoring. In addition, individuals suffering from a cold, sore throat or sinus problems that may impair their ability to detect odours will not be used.

8.3.4 The designated person will exit their vehicle and remain in the locality for a minimum of 1 minute whilst breathing normally. Any external activities that may contribute to odour generation in the surrounding area will also be noted on the form and an assessment of the intensity of the odour will be made using the key provided. The routine monitoring points have already been assessed for sensitivity, but should any additional locations be used the sensitivity will be entered using the key provided.

8.3.5 In the event odour is detected above intensity ranking 3 (moderate odour), the Facility management will be informed immediately, and the approximate location and extent of the odour plume assessed, and site operations reviewed and remediated.

8.4 Complaints Monitoring

8.4.1 Any complaints received directly by the operator or via the Regulatory bodies, including the EA and Local Authority, will be recorded on the operator's system. Investigation will then be undertaken via olfactory monitoring at the location of the complaint and on site to substantiate the extent and location of the plume and the source of the odour will be identified.

8.4.2 If necessary, monitoring will also be carried out at the nearest sensitive receptors to the Facility and the monitoring results recorded.

9.1.1 Following receipt of a complaint or identification of an odour at the Facility, the following action plan will be undertaken, including:

- Implementation of the mitigation measures as detailed in Section 6.2.
- Olfactory monitoring to assess the effectiveness of the mitigation measures employed.
- Additional olfactory monitoring as detailed above to identify the extent of the odour plume and potential cause for the odour i.e. waste material and / or process activity.
- Examination of the operational activities at the Facility at the time of the odour complaint or odour identification
- Examination of the meteorological conditions at the time of the complaint or odour identification
- Examination of the process conditions i.e. temperature and moisture content of the process piles, length of storage etc.
- Carry out a review of the operational procedure and process controls and instigate any control measures immediately following identification of the problem.

9.1.2 Further olfactory monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

9.2 Record Keeping and Reporting

9.2.1 The procedure for recording will be undertaken as detailed above. All information is recorded digitally and maintained within a digital database. All information can be accessed via a computer within the Site office and will be made available to the Environment Agency on request. This record keeping already forms part of the Management System.

9.3 OMP Review

9.3.1 This OMP will be reviewed on a regular basis or following receipt of a significant substantiated complaint that requires a change in management procedures for the STF.

Drawing

Appendix 1

Appendix 2

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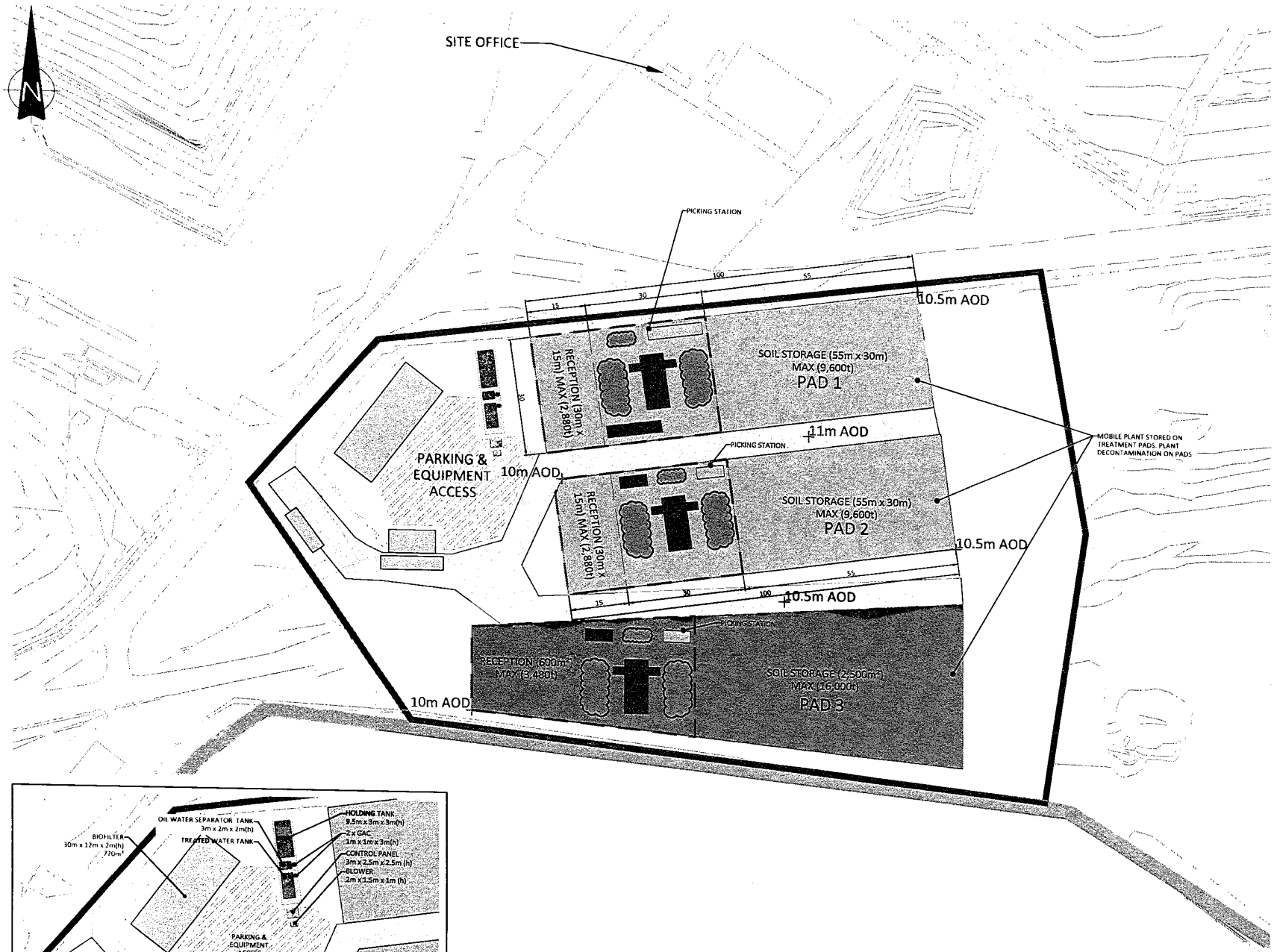

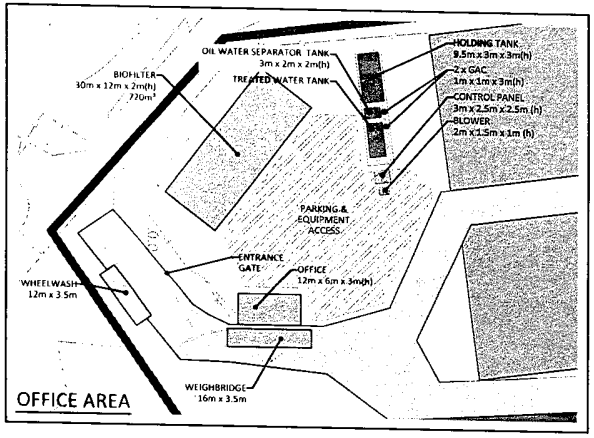

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	WHEEL WASH POSITION AMENDED	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SOILS TREATMENT PADS 1 / 2 / 3 SITE LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF	REVISION
29.09.2021	1:1000	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1807

Caulmert engineering environmental planning

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Daneshill Soils Treatment Facility

FCC Recycling (UK) Limited

Emissions Management Plan

Prepared by:

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Document Reference: 3982-CAU-XX-XX-RP-V-0307.A0-C2

October 2021

APPROVAL RECORD

Site:	Daneshill Soils Treatment Facility
Client:	FCC Recycling (UK) Limited
Project Title:	Environmental Permit Variation
Document Title:	Emissions Management Plan
Document Ref:	3982-CAU-XX-XX-RP-V-0307-A0.C2
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Reviewer	Andy Stocks	**Date**	15/01/2021
Approved	Andy Stocks	**Date**	15/01/2021
Revised	Kellie-Marie P. Burston	**Date**	01/10/2021

DISCLAIMER

EMISSIONS MANAGEMENT PLAN

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3982-CAU-XX-XX-DR-V-1804	Daneshill Landfill Site and Soil Treatment Facility
3982-CAU-XX-XX-DR-V-1805	Proposed Site Layout
3982-CAU-XX-XX-DR-V-1806	Cross Sections Drawing
3982-CAU-XX-XX-DR-V-1807	Treatment Pads 1, 2, and 3 Site Layout Plan
3982-CAU-XX-XX-DR-V-1812	Emissions Monitoring Plan for dust, asbestos and VOC's

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Appendix 2:	Soil Reception Procedure
Appendix 3:	Evergard Asbestos Surfactant MSDS Sheets
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Appendix 5:	Rowley Regis Biofilter Analysis

1. INTRODUCTION

1.1 Report Context

1.1.1 FCC Recycling (UK) Ltd (hereafter referred to as the 'Operator') operate Daneshill Landfill Site, which is located approximately 2km east of Lound Village, Nottinghamshire at National Grid Reference SK6755086750.

1.1.2 Caulmert Limited were appointed by the operator to prepare an application to vary the existing permit to include a Soil Treatment Facility (STF) which will operate on a constructed treatment pad within the landfill site boundary. As part of the application, an Emissions Management Plan (EMP) is required.

1.1.3 Preparation of this EMP has been in consultation with the following Environment Agency (EA) guidance documents:

1.1.4 Technical Guidance Notes (Monitoring) M8 – Ambient Air. Environment Agency, Version 2 (May 2011); and

1.1.5 Technical Guidance Note (Monitoring) M17 – Monitoring Particulate Matter in Ambient Air around Waste Facilities. Environment Agency, Version 2 (July 2013).

1.1.6 The Operator proposes to add the following listed activities to the current permit:

- Section 5.3A(1)(a)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;
- Section 5.3A(1)(a)(i) - Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.4A(1)(a)(i) - Disposal or recovery of non-hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment;
- Section 5.6 Part A (1) (a) – Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2 and 5.3;

1.1.7 This EMP provides details of appropriate measures that are required for effective emissions management and control at the facility during construction and operational phases.

1.1.8 The Operator are required to submit a EMP to consider the impact of dust & particulate emissions on receptors as a result of the construction and operational activities of the STF. This EMP provides means of assessing the effectiveness of control measures. The proposed Emissions Action Plan should be implemented in cases of failure and emissions events.

1.2 Objectives

1.2.1 This EMP has the aim of ensuring that potential emission sources are identified and controlled at source where possible. The EMP aims to minimise the risk of emissions

impact at locations outside of the facility boundary. Potential emissions as a result of the soil treatment facility include:

1) Dust

2) PM10's

3) Asbestos fibres

4) Biofilter: VOC's (including BTEX), Speciated PAHs, TPH, PID

1.2.2 As a minimum this EMP will consider the following elements:

- An assessment of the risks of emissions at the Facility;
- Identify the appropriate controls to manage the identified risks;
- Prevent the emissions of dust, PM10 and asbestos fibres;
- Emissions monitoring;
- Identify actions, contingencies and responsibilities when emission problems arise; and
- Regular review of the effectiveness of the control and mitigation measures.

1.2.3 All internal and external storage and treatment areas will be designed so that they collect, extract and direct all process emissions to an appropriate abatement system for treatment before release.

1.2.4 The EMP is supported by the procedures and controls established within the following documents:

- The Site Management Plan;
- The Site Operational Procedures; and,
- The Site Environmental Risk Assessment.

2.1 Site Setting

2.1.1 The proposed Soil Treatment Facility site is located within the footprint of Daneshill Landfill Site which is located approximately 2km east of Lound Village, 6km north-west of Retford and 11km north east from Worksop. The location of the proposed activity in relation to its surroundings is detailed in the Site Location Plan (3982-CAU-XX-XX-DR-V-1801).

2.1.2 The site is bordered to the north and east by agricultural land and mixed woodland and to the west. South-west are nature reserves and the Daneshill Lakes. The nearest residential dwelling to the site is Daneshill Cottages which lies approximately 75m to the south-west of the site and Loundfield Farm 200m east of the site.

2.1.3 The proposed location of the STF will fall within the current permit boundary of Daneshill Landfill Site; therefore, this application is not seeking to extend the permit boundary. The STF shall sit in the southern part of the site within the footprint of Daneshill Landfill Site as shown on drawing 3982-CAU-XX-XX-DR-V-1804.

2.1.4 The facility will be limited to accepting wastes that can be treated to a point where they can be used for restoration soils on the landfill.

2.2 Soil Treatment Operations

2.2.1 The STF is proposed to accept and process up to 29,999 tonnes per annum of hazardous containing visible bound pieces of asbestos and/or hydrocarbons and 20,001 tonnes of non-hazardous soils. The soils treated will be used for the restoration of the wider Daneshill Landfill site. The usual maximum biological treatment time for soils is 6 months in general with the majority being treated in periods of between 8-16 weeks.

2.2.2 The treatment areas consist of 2 treatment pads measuring at 3000m^2 and 3000m^2 for biotreatment/physical treatment and another 1 x 4000m^2 treatment pad solely for screening/processing. An indicative operational layout of the treatment and processing area and cross section is detailed in drawing refs: 3982-CAU-XX-XX-DR-V-1805, 3982-CAU-XX-XX-DR-V-1806 and 3982-CAU-XX-XX-DR-V-1807.

Asbestos Storage

Upon satisfactory pre-acceptance and waste acceptance checks, on arrival to site, the soils will be weighed and directed from the weighbridge to the soils reception area and undergo an inspection and sampling for analytical testing. Soils will be stored on impermeable surfacing provided with bunded edges and sealed drainage. After placement on the storage area, the soils will be sheeted to reduce the potential for air borne emissions. The pre-assessment testing is carried out to confirm the soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Until the testing has been completed, the soils will remain sheeted. Following satisfactory results from pre-assessment confirming that the soils are compliant with the acceptance criteria,

the soil can be stored externally, un-sheeted and will undergo pre-screening and handpicking for asbestos fragments. Asbestos containing soils with fibres concentrations that has to potential to become airborne at concentrations above the air monitoring detection limit will be rejected from site. Soils that meet all waste acceptance checks will be formally accepted for treatment.

Pre-screening and Handpicking of asbestos containing soils

2.2.3 Following formal acceptance, only hazardous soils containing asbestos will under-go pre-screening and handpicking, where pre-screening will be carried out prior to hand picking. Soils will be screened using a three-way screening (0-15mm, 15-50mm and 50mm+). This is to reduce the potential of damage to the picking station and make hand picking of asbestos debris more effective. All stockpiles generated from the screening/hand-picking will be visually inspected for the presence of residual asbestos prior to being samples for further biotreatment or reuse.

2.2.4 The picking station will provide an enclosed working area for hand-picking, details of the station specification is included in Appendix 1 . A conveyor belt will be used on the picking line providing a smoother running line which will aid the hand picking process. Treatment will only commence when waste acceptance testing has confirmed that the asbestos fibres content in soils is lower than 0.1% for chrysotile asbestos and 0.01% for all other forms of asbestos. Handpicking of small asbestos fractions will only be undertaken by suitably trained operatives, with asbestos fractions placed directly in polythene asbestos bags. The bags will be sealed and double bagged and will be placed in a designated sealed and locked asbestos bin.

2.2.5 Dust suppression will be provided for the screener as a preventative measure, in addition, air monitoring will be carried out hourly to assess if there is any detection of asbestos fibres above the method detection limit.

Screening of non-hazardous soils

2.2.6 Following acceptance and valid pre-acceptance testing results to confirm chemical validity, non-hazardous soils will be placed into their respective treatment batches and undergo physical treatment. Non-hazardous soils will be screened to remove oversize inclusions prior to reuse to ensure they are physically suitable.

2.2.7 Following screening, the soils will be stockpiled for use in recovery at Daneshill Landfill Site, this may also include soils that have undergone bioremediation process to remove oversized materials.

Bioremediation Process Description

2.2.8 The biological treatment process varies between 8 to 16 weeks, dependent on the contaminants present in the soil.

2.2.9 Bioremediation of soils will be undertaken on a newly constructed GCL lined pad comprising sand blinding, crushed concrete and sealed drainage to allow pumping to

holding tanks. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully. As there is no drainage network on site, all process waters will be pumped to on-site holding tanks with any excess water tankered off to an appropriate disposal facility.

2.2.10 Soils accepted at the STF are deposited on the treatment area. The soils are arranged into biopiles using a system of batches which allows the waste to be trackable by age of waste and from the point of origin to its location on the treatment pad.

2.2.11 Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

2.2.12 Biodegradation of the organic contaminants is carried out by microorganisms in the soil. This is enhanced by addition of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Management of moisture content is also essential for microbial activity; low moisture content has the potential to inhibit microbial growth, but excessive moisture can restrict airflow. The perforated aeration pipes located beneath the waste will extract air from the biopile to effectively control waste oxygen levels and moisture content to maintain aerobic conditions.

2.2.13 Temperature in the biopiles is maintained between 30 and 40°C to ensure the mesophilic microflora are predominately stimulated, optimising biodegradation.

2.2.14 The stages of the bioremediation process are detailed below:

- Initial Placement: The soil is placed on the treatment pad by a tipper lorry/dump truck where an excavator will form the biopile.
- Addition of Nutrients: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.
- Chemical Analysis – Approximately every 4 weeks the soil is analysed for contaminant concentrations to determine whether the biological treatment of the soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process
- Nutrients testing – Every 2-4 weeks the soil is analysed for nutrient levels within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process.
- De-compaction of the soil – Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil. Reintroduction of treated water into the biopiles if emissions

(e.g. dust) is being generated or soils are outside of the optimal moisture content range

- Validation testing: Once the soil treatment is deemed complete it is sampled for laboratory testing to ensure that contaminants meet the landfill re-use criteria.

2.2.15 On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent landfill void or reused on site as restoration soils.

2.2.16 There are no direct releases off-site other than via the engineered surface water management system. The site will be engineered so that all collected surface waters and process waters from biopiles will pass into a drain at the lowest points of the treatment pad and transferred into holding tanks. The holding tanks will store all surface and process waters until emptied and disposed of at a suitable facility offsite.

3. POTENTIAL SENSITIVE RECEPTORS

3.1.1 The proposed STF site lies within a flat lying land resting on highly permeable sand/gravel and Sherwood Sandstone deposits. The site is in a predominantly agricultural setting of which Loundfield Farm is located 500m to the east. Other nearby residential and domestic dwellings include a few properties and a traveller's site located on Daneshill Road. Industrial/ commercial properties such as Retford Ready Mix Limited (concrete suppliers) and Retford Dismantlers (used trucks) are located 330m south and 440m south-south-east from the site. Recreational activities including the Daneshill Sailing Club is located 520m west from the site boundary which utilises the Daneshill Local Nature reserve and lakes as part of its activities.

3.1.2 The site is bound by a number of populated settlements; the village of Lound 1.5km south east, Torworth Village 1.8km west, Mattersey village 2.6km north-north-east and the largest of the four settlements, Ranskill located 1.9km north-west from the site boundary.

3.1.3 A review of the prevailing wind direction has identified that the most dominant wind is from the south-west/south-south-west towards north-east/north-north-east. The wind direction is likely to blow towards Mattersey Village, Loundfield Farm and agricultural fields. Given the distance from the site boundary and the transient nature of odours from site, it is considered that receptors are unlikely to be impacted as odours are likely to dissipate in this distance.

3.1.4 A search within 500m did not locate any Special Protection Areas (SPA's), Specials Areas of Conservation (SAC's), Areas of Outstanding Natural Beauty (AONB), National Nature Reserves (NNR's) RAMSAR Sites, Ancient Woodlands or World Heritage Sites.

3.1.5 There are no Air Quality Management Areas (AQMA's) in the vicinity of the site.

3.1.6 The site is located on river material classified by the Environment Agency as a secondary A aquifer of which is further underlain by the Chester Formation, part of the Sherwood Sandstone Group and which is classed as a principal aquifer.

3.1.7 The potential receptors within 500m of the site boundary are provided on Drawing 3982-CAU-XX-XX-DR-V-1800 and are summarised in Table 1.

Table 1: Potential Receptors identified within 500m of the site boundary

Receptor	Activity	Distance from site	Direction from site
Traveller's Site	Residential	155m	SWS
Daneshill Road	Public road	250-500m	S, W, SW
Retford Ready Mix Limited	Industrial premises (concrete plant)	330m	S
Daneshill Lakes Nature Reserve	Nature Conservation	400m	W
Retford Dismantlers	Industrial vehicles dismantling	440m	W
Loundfield Farm	Residential	495m	E

Mattersey Hill Marsh SSSI	Nature Conservation	500m	NW
Residential properties off Daneshill Road	Residential	500m	SW
Daneshill Sailing Club	Recreational	520m	W
Scrap Yard	Industrial	860m	NW

Surface Water

3.1.8 The closest surface water feature is a stream approximately 460m to the West of the site, which flows North into the River Idle. There are two fisheries in the surrounding area, Clearwater Lake fishery located 1.1km North of the site boundary and Lakeside fisheries located 1.1km north west.

3.1.9 Daneshill Lakes Nature Reserve is located 400m West of the site boundary, in which there are several small lakes where the area is used for recreational use and sailing.

3.1.10 The site is not located within a flood risk zone.

4. SOURCE, PATHWAY & RECEPTORS

4.1.1 A risk assessment detailing the source, pathway and receptor has been included in Table 2 which identifies the mitigation measures to reduce the pathway to receptors from the proposed site activities relating to fugitive emissions. The Amenity and Accidents Risk Assessment, document ref: 3982-CAU-XX-XX-RP-V-0303.A0.C1 provides further detail on possible hazards of odour, noise & vibration, accidents as well as fugitive emissions.

4.1.2 The risk assessment details the control and mitigation measures to minimise emissions from operations at Daneshill Soil Treatment Facility.

4.1.3 It is considered that the majority of emissions are prevented from occurring and do not require further mitigation after the initial suppression. Monitoring will provide verification to the effectiveness of the suppression carried out on site.

4.1.4 Further detail on receptors, sources, pathways and controls measures relating to each table heading can be found in the following sections included within this Emissions Management Plan:

- Section 3: Potential Sensitive Receptors
- Section 5: Potential Emissions Sources
- Section 6: Potential Pathways
- Section 7: Control Measures

Table 2: Fugitive emissions risk assessment

What do you do that can harm and what could be harmed			Managing the risk			
Source	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
FUGITIVE EMISSIONS						
Dust from contaminated soil treatment Dust from storage of hazardous storage See Section 5 'Potential emission sources'	See Section 3 'Potentially Sensitive Receptors' Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Air - wind borne dust. See Section 6 'Potential Pathways'	Preventative and mitigation measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply and dust suppression by regular spraying in dry conditions; • Waste acceptance procedures to ensure soils that have the potential for dust emissions are not accepted • Dust suppression cannon/system with added asbestos surfactant; • Asbestos monitoring will be carried out quarterly against background reference levels determined with on site monitoring as a pre-commencement condition; • use of clean water for dust suppression, to avoid re-circulating fine material; • high standards of house-keeping to minimise track-out and windblown dust;	**Low** Dust emissions are transient in nature and likely to dissipate before settling Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not	Nuisance - dust on cars, clothing etc.	**Low - provided management procedures adhered to**

			• a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment; • minimisation of drop heights during tipping; • clear delineation of stockpiles to deter vehicles from running over edges; and • effective staff training in respect of the causes and prevention of dust. • Daily dust monitoring carried out to assess levels of emissions from site activities. • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site. **Specific measures** in relation to activities within the treatment facility include: • Misting equipment to be employed if required during summer months Meteorological conditions should be considered before activities such as transfer, and this activity should be minimised during unfavourable wind conditions. See also Section 7 'Control Measures'	downwind to the proposed STF. In addition, background dust from external sources at the Retford Concrete Plant, is likely to impact on Travellers site due to close distance. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors		

Pre-screening of asbestos soils Handpicking of asbestos soils See Section 5 'Potential emission sources'	See Section 3 'Potentially Sensitive Receptors' Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Wind – airborne asbestos fibres and inhalation See Section 6 'Potential Pathways'	Preventative and mitigation measures include: • provision on site of a water bowser equipped with rain gun and adequate year-round water supply by regular spraying in dry conditions with added asbestos surfactant; • Dust suppression cannon/system • Asbestos monitoring will be carried out quarterly against background reference levels determined with onsite monitoring as a pre-commencement condition; • For occupational exposure, daily asbestos monitoring will be carried out during soil screening operations. (See 'Section 8 Monitoring' of this Emissions Management Plan) • Use of clean water for suppression, to avoid re-circulating fine material; • Minimisation of drop heights during tipping; • Hand-picking operations are carried out in a fully enclosed picking station; • Pre-acceptance testing will be undertaken to quantify that asbestos fibres are lower than 0.1% for Chrysotile and 0.01% for any other forms of asbestos detected in soil. If there are exceedances of these limits then that soil will be rejected from site. See also Section 7 'Control Measures'	**Low** Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors	Asbestos linked illness	**Low - provided management procedures adhered to**

VOC and odour emissions resulting from waste handling, screening and biopile turning operations	See Section 3 'Potentially Sensitive Receptors' Workers and visitors to the site Industrial works located within a 500m radius of the site. Residential receptors within 200m of the site.	Wind – airborne See Section 6 'Potential Pathways'	Preventive and mitigation measures include: • Site visit prior to input to assess the odour potential of soils • Only authorise if odours/VOCs are biologically treatable contaminants and can be mitigated easily on site, no residual unacceptable odour/VOCs could remain after treatment and air actively removed from soil can be treated by biofilter during treatment • Soils are only formally accepted subject to reception testing and compliance with the original waste description. • Review against original waste description and quarantine if required • Cover with tarpaulin/soil/woodchip prior to reception analysis results being received or formal rejection (use tarpaulin only for potential rejection) • Place on air extraction systems to capture vapours/odours. • Monitoring of soil gases in extraction pipes to ensure total VOCs are below 40ppm/benzene below 1ppm prior to commencing soil turnover • Soil decompaction results in the opening of 3m wide sections of the biopile at any one time, this is to be sealed at the end of each working day • Biopile vacuum system to always maintain operation on pipes under stockpiled soil	**Low** Nearest residential receptors unlikely to be affected due to distance from site boundary. Not likely to significantly impact on travellers site due to tree screening and not downwind to the proposed STF. Direction of predominant wind not towards adjacent sensitive, travellers site and residential receptors	Odour nuisances	**Low - provided management procedures adhered to**

			• Biofilter flow rates to be adjusted to increase retention time if there is odour potential at the biofilter during soil turnover. • No screening of high VOCs/potentially odorous soils is ever undertaken. No screening is required prior to, or during biotreatment • Only screen soils where odours are not present (i.e., completion of treatment is only complete when soils have no odour, are non-hazardous and meet the site reuse criteria)			

5 POTENTIAL EMISSION SOURCES

5.1.1 Fugitive emissions can result from the receipt of contaminated soils if the waste acceptance procedure for soil inputs is not correctly implemented or if emissions mitigation measures are absent.

5.1.2 Potential emission sources have been identified from the proposed operational activities:

- Delivery of waste to site;
- Vehicle movements;
- Deposit of soils on the appropriate treatment area;
- Potential dust, particulates and asbestos fibres as a result of soil screening and hand picking;
- Bioremediation of hydrocarbon contaminated soils including initial placement, aeration and turning; and
- Storage and transfer of oversize materials (e.g. concrete debris etc) removed from soil screening.

6.1 Airborne Pathways

6.1.1 It is considered the potential pathway for dust ,particulate and asbestos fibre emissions to sensitive receptors are via airborne transmission. Factors affecting emissions include:

- Quantity of wastes;
- Wind direction, exposure and speed; and,
- Exposure of sensitive receptor to site operations.

6.1.2 Meteorological data from Doncaster/Sheffield airport weather station (winderfinder.com) indicates that the prevailing wind is from the south-west, west-south-west and west towards the north-east, east, and east-north-east. These wind conditions are reflective of those likely to be experienced at Daneshill Soil Treatment Facility. A review of the sensitive receptors in Table 1 shows that the receptor likely to be impacted by emissions within 500m of the site boundary, is Loundfield farm which is located 495m east from the site boundary. However, given the transient nature of airborne emissions and the distance of this receptor from site, it is unlikely to be significantly impacted by emissions from site.

7. CONTROL MEASURES

7.1.1 The following control measures will be implemented to minimise the impact of emissions from Daneshill Soil Treatment Facility.

7.1.2 During the construction of the geo-composite clay lined crushed treatment pad, drop heights will be reduced to ensure there isn't any unnecessary or excessive dust & particulate plumes. Lorry drivers delivering hardcore and aggregates which will form the foundations of the impermeable base will be advised at the weighbridge to reduce drop heights to minimise the likelihood of dust & particulate emissions.

7.1.3 Haul and traffic movements roads can be dampened down as necessary, especially during dry and windy conditions by use of a site bowser. When leaving site, all vehicles will be required to pass through the wheel wash prior to exit.

7.1.4 All staff will be trained and aware of the effect of dust and particulate emissions and to carry out activities in a way that will minimise any plumes as a result of handling and developing the crushed treatment pad.

7.1.5 A number of aspects of the site infrastructure and procedures on site are designed to mitigate dust emissions, including:

Biotreatment

- Soils are received and sampled and then placed onto the vacuum system which will capture emissions whilst the initial soil testing is completed.
- Screening of contaminated soils is not required prior to biotreatment
- Soils are formed within their initial reception area into biopiles, and the surfaces sealed using an excavator bucket.
- The use of a static biopile reduces the amount of soil management to a minimum. In a typical treatment period, the soils are turned over twice.
- The mineralization of hydrocarbons results in elevated moisture content in soils reducing the potential for dust emissions
- The biopiles can be irrigated as a mitigation measure should surface dust be observed, albeit this is rarely required.

Asbestos

- Waste acceptance for soils with asbestos inclusions are limited to bound pieces and strict asbestos fibre limits that have been shown to not release airborne asbestos fibres above WHO air quality guidance levels of <0.0005f/ml
- Covering asbestos contaminated soils awaiting treatment with tarpaulins will prevent fugitive emissions
- Use of surfactant-water misting system in operational areas where there is the potential for uncovered soil processing works has been shown to supress dust and ensure that airborne asbestos monitoring below <0.0005f/ml
- The general stockpile orientation of west to east is generally parallel to prevailing wind direction
- The site is surrounded by woodland resulting in a more sheltered and less exposed position than other potential sites within the Daneshill waste management facility.

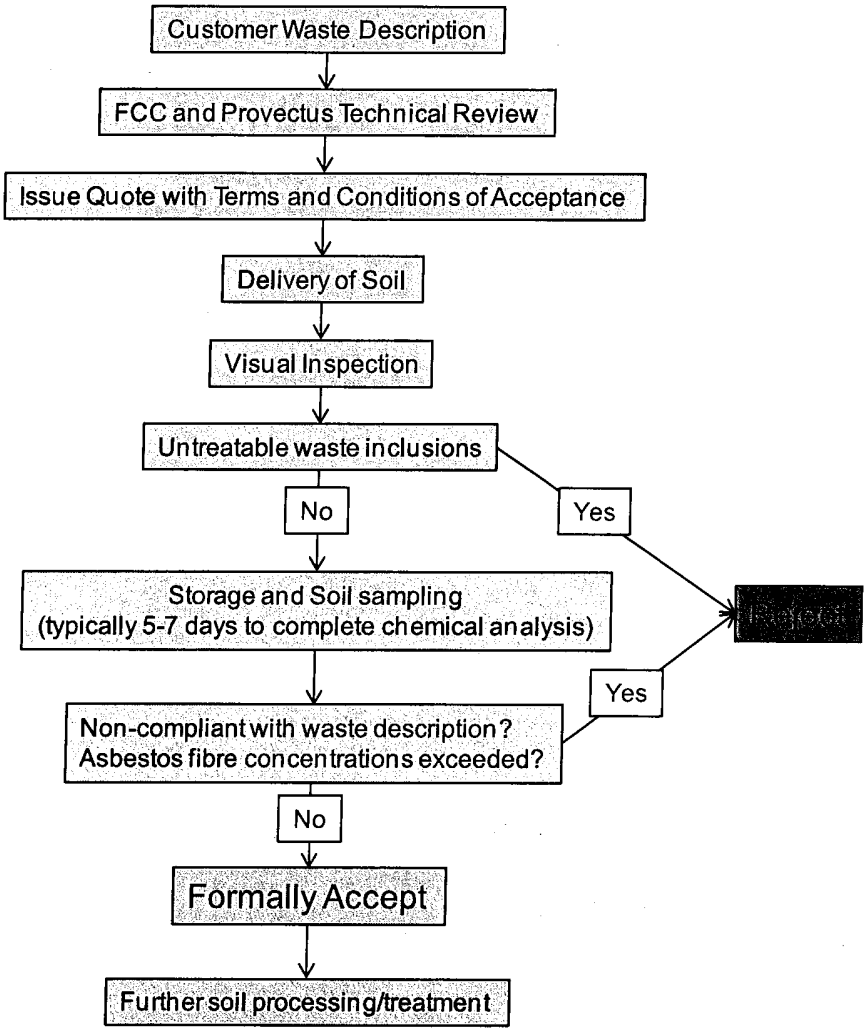
Pre-acceptance, Waste Acceptance and pre-assessment

7.1.6 In addition to FCC's Waste Acceptance Procedures, the site will operate in accordance to the Provectus 'STF – FO02- Soil Reception Procedure' (Appendix 2) which details specific procedures and measures for the pre-acceptance of hazardous soils, including rejection of non-conforming wastes. Form FO03 (Appendix 2) details the soil characterisation procedures and measure undertaken for sampling of soils received at the STF.

7.1.7 The weighbridge will conduct assessments of waste inputs and impose controls and restriction on potentially dusty waste (e.g. bagging, rapid cover following placement, refusal to tip).

7.1.8 Soil with asbestos will be consigned by contractors and haulier as 17 05 03* 'soils and stones containing hazardous substances' or 17 06 05* 'other construction materials containing asbestos'. All asbestos containing wastes will undergo visual inspection and chemical analysis to ensure that any soils that are formally accepted are suitable for further soil processing/treatment without the potential for any asbestos fibre emissions above the detection limit. A summary of waste acceptance is shown in Figure 1 below.

Figure 1: Summary of Waste Acceptance Procedures – Asbestos containing wastes



7.1.9 Unacceptable forms of asbestos containing wastes which will be rejected include:

- Asbestos pipe lagging;
- Loose asbestos fill;
- Asbestos insulation board; and,
- Soils with elevated asbestos fibres in any form that could result in airborne emissions above the detection limit (0.01f/ml) or reference background level (see Section 8 Monitoring).

7.1.10 Pre-assessment will be carried out to identify the asbestos fibre concentrations in soil, and to ensure that waste soils only containing identifiable pieces of bonded asbestos are subject to further treatment. This approach will eliminate the potential for airborne asbestos fibre emissions above the detection limit. Pre-assessment testing will confirm that asbestos fibre content is less than 0.01% for chrysotile asbestos and 0.01% for all other forms of asbestos. Any results above these levels will be rejected. During the storage time waiting for pre-assessment results, the soil will remain sheeted. Only on satisfactory laboratory results will the waste soils be un-sheeted. Air monitoring will be undertaken during treatment of soils to provide reassurance that there are no airborne asbestos fibres present above the detection limit at all times.

Site Traffic and movement of vehicles

7.1.11 All site traffic will be kept to designated haul routes. The surface of internal haul routes will be inspected daily and swept when required with any defects made good.

7.1.12 Further standard good practices for haulage on site will include:

- Setting appropriate site speed limits and vehicle routes;
- Even loading of vehicles to avoid spillages;
- Ensuring even road surfacing and maintenance of potential potholes;
- Regular removal of spilled material from site haul routes; and,
- Dust suppression by regular spraying in dry conditions where there is the potential to generate dust and release of particulates and asbestos fibres.

7.1.13 A wheel wash is used to remove any debris or other deposits on internal roads to prevent drag out onto the public highway. In the event that drag-out is observed, then a road sweeper will be employed.

Waste Storage & Treatment

7.1.14 During particularly dry weather the storage areas will be dampened down as necessary. A tractor fitted with a bowser can be deployed during warm, dry and windy conditions to dampen down haul roads. The site will also be provided with dust & particulate suppression cannons which will spray a mist air to reduce the potential for airborne dust, particulates and asbestos fibres.

7.1.15 The soils will be stored on the impermeable pad that will be constructed with sealed drainage to onsite holding tanks.

7.1.16 The moisture content of the biopiles is maintained at a constant level to allow the bioremediation and subsequently minimise the dust, particulate and asbestos fibre potential. If soil is observed to be generating emissions on that biopile, it is an indicator that moisture content is too low. Irrigation of the biopile with treated water will then be implemented to rehydrate the soil to the correct moisture content levels thereby eliminating any potential emissions. Operational controls during the bioremediation process are in place to ensure no turning of the biopiles is undertaken during high winds.

7.1.17 On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust.

7.1.18 Drop heights will be minimised during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for dust and particulate release as a consequence of agitation.

7.1.19 All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance. A road sweeper will be regularly hired into clean site roads of any mud trailed on from site vehicles. Dampening of site roads/surfaces as necessary using a tanker/water bowser during dry periods will minimise dust.

Asbestos Screening and hand-picking

7.1.20 The control of asbestos emissions is predominantly based upon only receiving soils that are proven to pose no potential for airborne emissions of asbestos fibres above the detection limit. Asbestos fibres are not generated on site above the detection limit so no abatement system is required.

7.1.21 Soils with asbestos will be quarantined prior to formal acceptance even where in the majority of cases, soils have already been visually inspected and sampled prior to a formal offer for accepting the soils has been issued to the waste producer. The reception testing also includes for moisture content which will provide information on the dust potential in addition to the asbestos fibre quantification.

7.1.22 Reception testing will be undertaken at the receipt of soils and any soils that contain >0.1% chrysotile fibres, >0.01% other forms of asbestos fibres, or any form of unbound asbestos will be rejected from site. As an extra level of mitigation all externally stored asbestos contaminated soils will be covered prior to transfer for screening and hand picking.

7.1.23 Within the asbestos soils storage and treatment areas, a dust suppression system is available to reduce dust and any particulate emissions. However, even without this operating and treatment activities operational there has never been an incidence of airborne asbestos being measured above the detection limit using Phase Contrast Microscopy (PCM) or if required to achieve a lower detection limit: Scanning Electron Microscopy (SEM) or Transmission Electron Microscopy (TEM).

7.1.24 Asbestos containing soils which has passed the pre-acceptance and waste acceptance will undergo a processing system comprising of a three-way soil screener according to the sizing fractions of; 0-15mm (fine fraction), 15-20mm (mid-range) and 50mm+ (oversized). Any soils with visible asbestos will go through further screening and hand picking to remove the asbestos element. All fractions will be visually checked for the presence of any residual asbestos debris before final resampling prior to biotreatment. Asbestos classified as 17 06 05 which has been removed from soils will be placed in a sealed, covered and lockable skip for onward disposal. Records of hazardous waste disposed from the site will be kept by the operator. The picking station will be an enclosed working area and dust suppression to reduce the potential for dust, particulate and asbestos fibre emissions. In addition, air monitoring will be carried during the pre-screening and hand-picking to confirm that asbestos levels are below the detection limit of 0.01f/ml. However, it is considered that due to pre-acceptance testing and previous experience, the risk of asbestos fibres being detected during air monitoring is extremely low. Monitoring in addition to the occupational monitoring will be undertaken on a periodic basis to ensure compliance with the agreed background reference level for airborne asbestos.

Dust Suppression

7.1.25 During particularly dry weather the storage areas will be dampened down as necessary. A tractor fitted with a bowser can be deployed during warm, dry and windy conditions to dampen down haul roads. Misting suppression cannons will spray a mist air to reduce the potential for airborne dust and asbestos particulates. Misting cannons will be situated so that they concentrate spraying on storage, active and operational areas including the pre-screening and hand-picking for asbestos. The waters for dust suppression systems will be dosed with an asbestos surfactant additive which is a specially formulated solution which is capable of penetrating and "wetting out" amphibole (hydrophobic) forms of asbestos quickly and thoroughly. A copy of the MSDS sheets for the asbestos surfactant can be found in Appendix 3.

7.1.26 Dust generation is largely on haul roads and road sweeping/dust suppression is undertaken at source to prevent or minimise dust emissions occurring.

7.1.27 In addition, air monitoring testing will be carried out over an hour period to identify any elevated airborne asbestos fibres as a result of site activities to ensure compliance with occupational exposure reference standards. On a periodic basis this will be supplemented by background environmental monitoring that is undertaken for a longer period to achieve the lower background reference detection limit.

Bioremediation Process

7.1.28 The biopiles are operated using vacuum technology that means that >99% of volatile contaminants within soil pore spaces are collected and treated at the adjacent biofilter. Emissions from the biotreatment pad will be collected by undersoil pipework with liquids treated in the water treatment system and air treated by the biofilter. The conversion of hydrocarbons to carbon dioxide and water vapour means that the soil moisture

concentration in soils is elevated during treatment and is rarely, if ever below 15-20%. Soil in treatment does not give rise to visible dust or elevated dust concentrations during treatment.

7.1.29 The bioremediation process in itself provides mitigation where the moisture content of the biopiles is maintained at a constant level either through the generation of water vapour within the pile or the reinstruction of treated water into soils to allow the bioremediation to continue optimally and subsequently minimising the risk for dust emissions. Operations controls are in place to ensure that no turning of biopiles in undertaken during high windy weather conditions.]

7.1.30 Air forced down through the biopiles via the extraction pipework system will pass through a biofilter before being discharged to air.

7.1.31 The blower connects to a manifold with several perforated pipes covered in stone above an impermeable surface. Overlying these pipes is oversize compost or woodchip mixture, nutrients and small amount of contaminated soil (<5%) to inoculate the biofilter placed to a height of approximately 1.5m. The compost/nutrient/soil mixture is overlain by an irrigation pipe network on top to maintain the moisture content and covered with a tarpaulin to ensure the biofilter does not dry out. It is then tested every month to ensure the process parameters remain within the optimal range. Olfactory odour checks are also undertaken daily. Biofilter emissions monitoring include monthly VOC's (including BTEX), Speciated PAHs, TPH, and bi-monthly photo-ionization detector (PID). Limits and thresholds of monitoring parameters are included in Table 5 'Emissions Monitoring'.

7.1.32 Fugitive emissions from biopile activities are extremely limited with the only measurable emissions generally occurring during the initial reception of soils from tipper lorries. Mitigation measures relating to soil turnover for dust, VOC's and odour is included in Table 3.

Table 3 Dust, VOCs and Odour Mitigation – Soil turnover

Parameter	Mitigation
Dust	Soils are formed into 3-4m high biopiles with sealed sides. Turning is undertaken once every 3-4 weeks only for decompaction reasons and so overall soil movements are very limited. Soils in treatment have hydrocarbons converted to carbon dioxide and water. Increasing water content within soils during treatment has been shown to prevent dust emissions. Treated water can be used to irrigate dry soils at surface for dust suppression during prolonged dry and windy weather
VOCs and Odour	Site visits are undertaken prior to soils being accepted to ensure odours are not significant during soil reception. Daily cover of soil may be required for occasional loads of odorous soil The vacuum applied to soils shortly after receipt has been demonstrated to significantly mitigate odour release with 2-3 air exchanges in soil per hour. The biofilter is used continuously for soil gas effluents No turning of soils is undertaken until soil gas samples indicate low levels of total VOCs – typically <40ppm total VOCs

7.1.33 Management procedures for fugitive emissions of odours are provided in Table 4 below.

Table 4. Odour and VOCs Management

Source of Emissions	Mitigation options
Potential of odours/VOCs from details included in waste enquiry	• Site visit prior to input to assess the odour potential of soils • Only authorise if odours/VOCs are biologically treatable contaminants and can be mitigated easily on site, no residual unacceptable odour/VOCs could remain after treatment and air actively removed from soil can be treated by biofilter during treatment • Soils are only formally accepted subject to reception testing and compliance with the original waste description
Odour present upon receipt of waste load	• Review against original waste description and quarantine if required • Cover with tarpaulin/soil/woodchip prior to reception analysis results being received or formal rejection (use tarpaulin only for potential rejection) • Place on air extraction systems to capture vapours/odours
Odour/VOCs from biopile turning operations	• Monitoring of soil gases in extraction pipes to ensure total VOCs are below 40ppm/benzene below 1ppm prior to commencing soil turnover • Soil decompaction results in the opening of 3m wide sections of the biopile at any one time, this is to be sealed at the end of each working day

	• Biopile vacuum system to always maintain operation on pipes under stockpiled soil • Biofilter flow rates to be adjusted to increase retention time if there is odour potential at the biofilter during soil turnover
Odour/VOCs from screening soil	• No screening of high VOCs/potentially odorous soils is ever undertaken. No screening is required prior to, or during biotreatment • Only screen soils where odours are not present (i.e., completion of treatment is only complete when soils have no odour, are non-hazardous and meet the site reuse criteria)

PM10 emissions from vehicles

7.1.34 The main sources of PM10 emissions on site are largely from heavy plant and vehicle traffic from:

- Excavators
- Dump trucks
- Tipper/articulated lorries

7.1.35 The Daneshill Soils Treatment facility haul routes will be designed to only allow a one-way traffic system to be employed. The haul route will be designed and managed so that vehicles idle times during delivery and drop off to the asbestos storage and processing areas are reduced. Storage areas will always be made available for delivery of materials. This will significantly decrease the time the lorry is present on site and result in a reduction in PM10 emissions.

Off Site Emission sources

7.1.36 The Retford Ready Mix Limited Concrete Supplies are located 330m south from the site boundary across Daneshill Road. It is considered that given the wind direction, there is potential for the concrete supplies as a source of wind-blown dust and particulate matter. Dust and particulates emissions are most likely from accumulation on site roads and operating activities such as loading, unloading and bagging.

9.1 Baseline Background Monitoring

9.1.1 It is an established procedure to attain pre-operational baseline monitoring to form the basis when determining the air quality prior to any treatment activities and the issue of the permit The operator will obtain baseline background monitoring prior to the commencement of operations where 3 rounds of monitoring will be taken at locations shown on drawing ref: 3982-CAU-XX-XX-DR-V-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's.

9.1.2 Following issue of the permit, the operator will be able to compare the monitoring results against reference background levels obtained from baseline monitoring. The background reference levels will be used as an action level should there be any soils with elevated asbestos fibres above the detection limit (0.01f/ml) or reference background level.

9.2 Schedule

9.2.1 Emissions monitoring will be undertaken in order to assess the effectiveness of the operational management and mitigating control measures at the STF. Monitoring will identify the potential for nuisance emissions to impact the nearby receptors, and the appropriate remediation measures required. Environmental monitoring locations are detailed in the Dust and Asbestos Monitoring Plan, drawing ref; 3982-CAU-XX-XX-DR-V-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's. PM10 will be undertaken around the working areas with a handheld decide.

9.2.2 Daily visual air monitoring during the soil processing works will be carried out to ensure that site activities do not increase emissions.

9.2.3 Monitoring will be undertaken by designated staff that will be fully trained by Site management. All site personnel will be responsible for reporting any problem emissions identified during their day to day operations.

9.2.4 Monitoring at the Facility will consist of the following detailed in Table 5 Below:

Table 5: Emissions monitoring

Parameter	Frequency	Thresholds	Comments
Asbestos (TCM)	Daily during initial soil screening	<0.01f/ml *Asbestos monitoring at locations around the STF during soil screening over 2 hour period	Method as described in M17 guidance and Table S3.3. This frequency is far in excess of other similarly permitted facilities. Monitoring undertaken around the treatment during soil screening process.

		*Pumped sampling >1m above ground level Flow rate = 4 litres/minute, minimum sample volume 480 litres, filter pore size = 1.2 µm asbestos fibre limit of detection = 0.001 fibres/ml	
Asbestos (SEM)	Quarterly	Supplementary asbestos monitoring at boundary locations (see drawing ref: 3982-CAU-XX-XX-DR-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's) to ensure compliance with an agreed background reference level.	Added reassurance to ensure baseline of asbestos emissions is not changing. Method is as described in M17 guidance. Detection limit anticipated to be <0.0005f/ml. This monitoring is far in excess of other similarly permitted facilities. Pre-operational background monitoring will be carried out at locations shown on 3982-CAU-XX-XX-DR-V-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's. 3 rounds of monitoring will be taken prior to the commencement of activities at site and prior to the issue of the permit.
Dust	Monthly	200mg/m^2/day On Site checks and off site check in response to an issue being identified. Dust monitoring at locations onsite using Frisbee dust gauges,	Frisbee dust gauge method as described in M17 guidance. Daily on-site checks (or more frequently following dust complaints, or during prolonged dry or windy conditions)
Soil moisture content	Reception testing of soils as per	15% moisture content	To ensure soils received have low potential for dust release
Asbestos content in soils	Reception testing of soils	<0.1% chrysotile, <0.01% other types of asbestos fibres. No visible unbound asbestos or insulation	To ensure soils received cannot generate airborne emissions of asbestos above the method detection limit

PM_{10}	Weekly or as required if dust is suspected	250µg/m3/15 minute TWA*	Use of handheld nephelometer – not used for compliance against EU Directive Limit for PM_{10} as stated in EA Guidance M8, but provides real time results for implementing immediate mitigation if results are within 25% of threshold. A handheld mobile device for discrete monitoring around working areas. This method is preferred to support operational control of emissions rather than a fixed monitoring system for general air quality analysis at fixed locations (e.g. Filter Dynamics Measurement System/Beta Attenuation Monitor)
VOCs	Weekly or as required	1mg/m^3 benzene	Use of calibrated PID around working areas on biotreatment pad. For ensuring RPE requirements are respected and biofilter is not overloaded with VOCs from incoming soils.
Odour	Daily	Absent	To ensure site activities do not cause nuisance

9.3 Biofilter Monitoring

9.3.1 Biofilter monitoring proposed at Daneshill Soils Treatment Facility are included in Tables 5 and 6 below:

Table 5. Biopile Monitoring Frequency

Parameter	Frequency	Reason
pH	Monthly or as required during soil turnovers	To ensure that the pH stays between 5-9
Temperature	Weekly	An indirect indicator of microbial respiration
Moisture content	Monthly or as required during soil turnovers	To identify if soils are waterlogged or have the potential for dust during a turnover
Oxygen levels	Weekly	To identify
Available Nitrogen	Fortnightly per batch	To ensure the presence of sufficient available nitrogen to support mineralisation of hydrocarbons
Vacuum pressure	Continuously	To ensure that oxygen levels in soil are always optimal at >10%. To provide continuous capture of any VOCs extracted from soil and treatment by biofilter to prevent fugitive emissions as far as practical
Soil contaminants	Monthly or as required during soil turnovers	To monitor when soils are suitable for use in the restoration scheme for the landfill

Table 6. Biofilter Monitoring

Parameters	Unit	Detection limit	Action trigger limit
BTEX	mg/m^3	0.05	
TPH	mg/m^3	0.05	
Top 16 PAH	mg/m^3	0.05	
Moisture content	%		<60 or >80
Grain size	mm		<10 or >25
Total N*	mg/kg		<400
Total P**	mg/kg		<150
pH			<6.5 or >8.5

9.3.2 The following actions are provided for parameters being out of optimal range:

- BTEX/TPH/PAHs elevated – reduce airflow and investigate moisture content/grain size/total N and P and pH
- Reduced moisture content – irrigate biopile
- Elevated moisture content – remove tarpaulin and turn pile
- Grain size <10mm – replace biofilter matrix
- Total N <400mg/kg and Total P <150mg/kg – add nutrients
- pH <6.5 or >8.5 – replace biofilter matrix

9.4 Air Quality - VOCs limits

9.4.1 Limits of VOC were derived from the applicant providing a full 20 months of monitoring data for the biofilter at their Rowley Regis site that will be replicated at Daneshill Soil Treatment Facility. The biofilter design and site operations will be the same and therefore emissions are predicted to be the same. Copies of analyses from the Rowley Regis site are included in Appendix 5 for information.

9.4.2 It can be seen that the average annual point source emissions at the biofilter are below public health protection benzene standard of 5 $\mu g/m^{-3}$ as an annual mean. The average annual concentrations during 2018 were 2.81 $\mu g/m^{-3}$ (conservative as assumes results shown as less than detection level were at detection level) and during the first 9 months of 2019 results were all below 5 $\mu g/m^{-3}$ and mostly below detection level at the biofilter demonstrating protection to nearby receptors.

9.5 Photo-Ionisation Detector Measurements

9.5.1 A photo-ionisation detector (PID) shall be used on a bi-monthly basis at around the perimeter and near the biofilter (6) to quantify gaseous emissions. If PID readings for Benzene exceed 1ppm (based on EH40 guidance), then the source shall be identified and

assessed by the operator. It will be dealt with, for example, increasing PPE levels on site, a cessation of soil movement or covering of odorous soils with a tarpaulin etc.

9.5.2 If site activity involves the movement of soil that has been identified as containing high concentrations of VOC which may be harmful to personnel working in the vicinity or other off-site receptors, then PID and benzene monitoring shall occur on a daily basis.

9.5.3 Results are recorded in the on-site database system. Detail of the frequency and thresholds of monitoring are included in the Emissions Management Plant, document ref: 3982-CAU-XX-XX-RP-V-0307.

9.6 Meteorological Monitoring

9.6.1 It is considered that the principle mechanism for the transit of emissions from site activities to nearby sensitive receptors is likely to be via airborne. Meteorological conditions will heavily impact and determine the level of risk and exposure to sensitive receptors. The following factors are likely to influence the risk:

Wind Direction & speed

9.6.2 The dominant wind direction determines which receptors are likely to be impacted and levels of exposure. Wind speed will affect the likely distances odours can be transported, however, in contracts increased wind speed is likely to dissipate odours.

Ambient air temperatures

9.6.3 Higher temperatures and warmer conditions can result in an increased risk of odour emissions from site. Staff will be trained to be vigilant of meteorological conditions and those likely to encourage odour emissions.

9.6.4 In the event of an emissions complaint, conditions will be assessed against the complaint and details of site activities/operations carried out during the time of that complaint. Meteorological information will be recorded on the Complaints Form.

9.7 Emissions Monitoring

9.7.1 Prior to the operation of the facility, asbestos monitoring will be undertaken at locations shown in drawing ref: 3982-CAU-XX-XX-DR-V-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's, to establish an agreed background reference level for asbestos in accordance with EA technical guidance document M8 and M17. The agreed reference level will be used for periodic monitoring on a quarterly basis to ensure no increase in asbestos concentration in air above the background reference concentration.

9.7.2 Dust and Asbestos monitoring during the operations on site will be undertaken at environmental monitoring points onsite using Frisbee dust gauges to measure for

deposited dust, their locations are shown in the Dust and Asbestos Monitoring Plan;3982-CAU-XX-XX-DR-V-1803 and drawing ref:3982-CAU-XX-XX-DR-V-1812 Emissions Monitoring Plan for dust, asbestos and VOC's. Limits and frequency of monitoring will be as per the existing permit. The air extraction system will be regularly monitored and maintained. The biofilter will be monitored for the following parameters on a monthly basis for VOCs (including BTEX), Speciated PAHs and TPH. PID will be carried out bi-monthly.

9.7.3 The air sample analysis undertaken before and after the biofilter demonstrates that ~99% of monitored contaminants are continuously removed during the operation of the STF. The biofilter is operational 24 hours per day.

9.7.4 The biofilter will also be regularly checked and maintained to ensure appropriate media particle size, temperature and moisture content. Equipment will be calibrated in accordance with manufacturer's instructions or as agreed with the Environment Agency. These procedures will maintain and effective air extraction system, reducing odour emissions and identifying any leaks or damage for repair. Compliance with this requirement will be demonstrated by the monthly biofilter monitoring and regular VOCs monitoring at the site.

9.7.5 As part of the daily inspections, appropriately trained and experienced site personnel will carry out an on-site inspection to monitor visual dust, particulates, and asbestos fibres emission generation, which will be recorded on the daily inspection form. The records of the site daily inspections will be made available to the EA on request.

9.7.6 Visual monitoring will include observing the movement of vehicles, stockpiling and movement of materials, to establish if such operations are giving rise to emissions and the size and frequency of these releases.

9.7.7 The frequency of site inspections will be increased when site activities with a high potential to produce emissions are being carried out and during prolonged dry or windy conditions.

9.7.8 In the event that visual emissions are observed to be crossing the site boundary or surfaces are becoming soiled, the site management will be informed immediately and the approximate location and extent of a dust/particulate plume, or deposition, assessed and site operations reviewed and remediated.

9.7.9 Asbestos monitoring will be carried out by placing air pumps around the perimeter of the working area whilst soil screening is being undertaken, locations of the pumps will be determined by wind direction on the day of sampling. Asbestos monitoring will only be undertaken during periods when asbestos contaminated wastes are being accepted and treated.

9.7.10 PM10 Monitoring will be carried out in working areas and carried out weekly (and or when dust is suspected). Equipment will consist of a handheld nephelometer mobile device for discrete monitoring.

10.1 Complaints Procedure

10.1.1 As part of this EMP, engagement with the neighbours will be undertaken.

10.1.2 Typically, any complaints received at the site are likely to be through the Environment Agency or Local Authority although the operator is willing to deal directly with the complainants and where necessary the following can be implemented:

- Information can be provided to the local neighbours (via the Environment Agency) regarding the point and method of contact for the Facility in the event that fugitive emissions has been detected or they want to discuss any activities at the Facility.
- The neighbours can be advised that any complaints / concerns will be addressed immediately following identification / notification and contingency action implemented.
- The neighbours can be advised of any corrective action and a follow up call carried out if required.

10.1.3 The Operator will continue to maintain a routine liaison with the Environment Agency regarding nuisance emissions from site. In the event of an emissions complaint being received by the EA the complaint is passed to the Operator for the investigation. The primary point of contact at the site for complaints and liaison within the neighbours is the Site Manager who will ensure that the recording, investigation and close out of complaints is undertaken as described below and in accordance with company management procedures. Every complaint will be recorded on FCC Recycling internal system as below:

- All complaints are recorded by the site manager or site staff on the FCC 'Safeguard' online incident recording system, describing the complaint and severity;
- The complaint can be forwarded to the Regional Environment Manager to undertake further investigation;
- Depending on the severity, the complaint can be escalated to senior management for investigation if necessary; and,
- The system is a digitalised process and records a wide range of reporting.

10.2 Complaints Monitoring

10.2.1 Any complaints received directly by the Facility or via the Regulatory bodies, including the EA and Local Authority, will be recorded on the FCC 'Safeguard' online incident recording system. This will instigate emissions monitoring at the location of the complaint and on site to determine the source and extent of the plume.

10.2.2 If necessary, monitoring will also be carried out at the nearest sensitive receptors to the Facility and the monitoring results recorded.

11.1.1 Following receipt of a complaint or identification of visual emissions at the STF which may give rise to an offsite impact the following action plan will be undertaken, including:

- Additional monitoring as detailed above to identify the extent of the impact and potential cause and source;
- Examination of the operational activities at the Facility at the time of the complaint or identification of an impact;
- Examination of the meteorological conditions at the time of the complaint or identification of an impact;
- Carry out a review of the operational procedure and process controls as detailed in Section 4 and instigate any control measures immediately following identification of the problem;
- Further monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

11.2 Record Keeping and Reporting

11.2.1 The Complaints Form will be completed, and the forms will be maintained free from damage and kept within the Site office and will be made available to the regulating authorities on request. The record keeping will form part of the Facilities Management System.

11.3 EMP Review

11.3.1 This EMP will be reviewed by site management on a regular basis as a minimum to ensure that the controls described are effective and reflect best available techniques. The EMP will also be reviewed following a number of complaints at the Facility or relevant changes in the site operations or procedures.

DRAWINGS

P02	RECEPTOR BOUNDARY INCREASE	EJD	KB	AS	25.11.19
P01	ISSUED FOR INFORMATION	EJD	KB	AS	04.11.19
REV	MODIFICATIONS	BY	CH	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION — STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: 1000m SENSITIVE RECEPTOR PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF	REVISION
04.11.2019	1:2500	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1800

Caulmert

P2	ISSUED FOR INFORMATION	KB	KB	AS	10.12.19
P1	ISSUED	KB	KB	KB	14.11.19
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

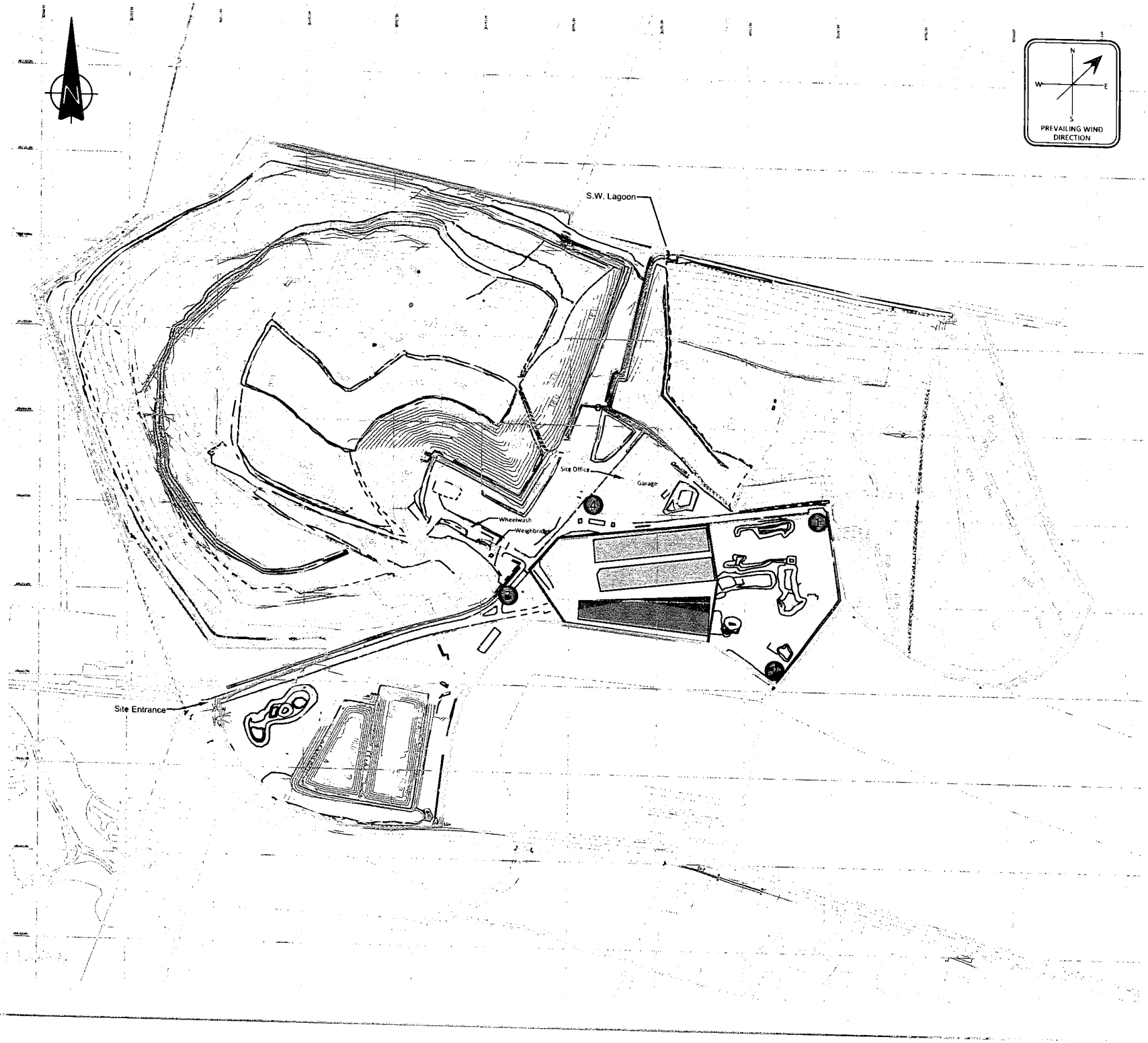
TITLE: SITE LOCATION PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	KB	KB	KB

DATE	SCALE @ A1	JOB REF:	REVISION
14.11.2019	1:10000	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1801

Caulmert planning



NOTES

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

LEGEND

- COMBINED DUST AND ASBESTOS MONITORING POSITIONS
- AREA OF PROPOSED ACTIVITY
- PERMIT BOUNDARY
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING AREA

P07	MONITORING POINTS AMENDED TO P04	EJD	KB	AS	18.01.21
P06	ENVIRONMENTAL MONITORING POINTS ADDED	EJD	KB	AS	15.01.21
P05	MONITORING POINTS UPDATED	EJD	KB	AS	26.11.20
P04	LEGEND UPDATED	EJD	KB	AS	24.03.20
P03	MONITORING POINTS UPDATED	EJD	KB	AS	03.02.20
P02	MONITORING POINTS UPDATED	EJD	KB	AS	09.12.19
P01	ISSUED FOR INFORMATION	EJD	KB	AS	05.12.19
REV.	MODIFICATIONS	BY	RE.	AP.	DATE.

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

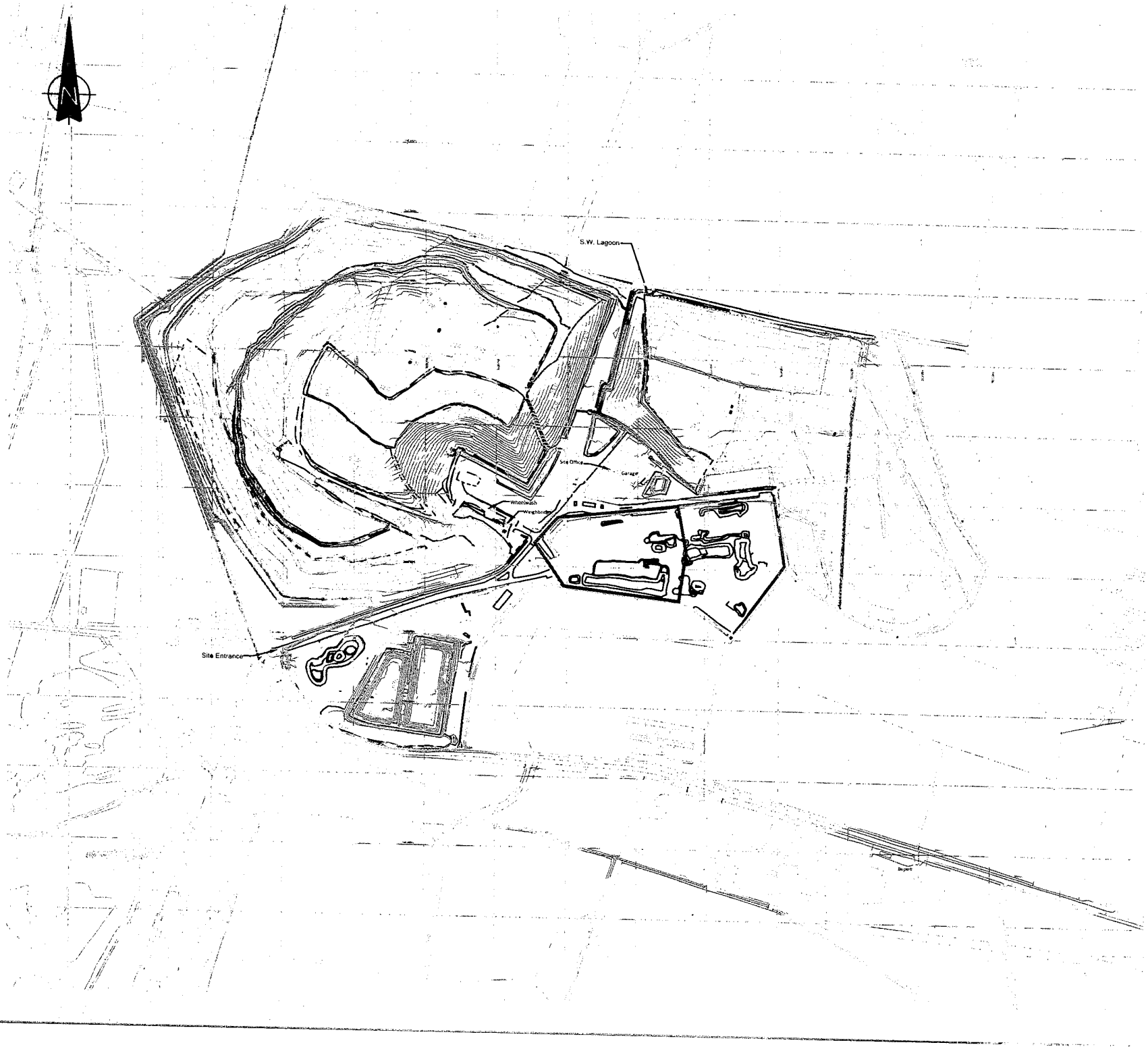
PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: DUST AND ASBESTOS MONITORING PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF.	REVISION
04.12.2019	1:4000	3982	P07

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1803

Caulmert engineering environmental planning



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LEGEND

PERMIT BOUNDARY

AREA OF PROPOSED ACTIVITY

REV	MODIFICATIONS	BY	RE	AP	DATE
P1	ISSUED FOR INFORMATION	EJD	KB	AS	03.02.20

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

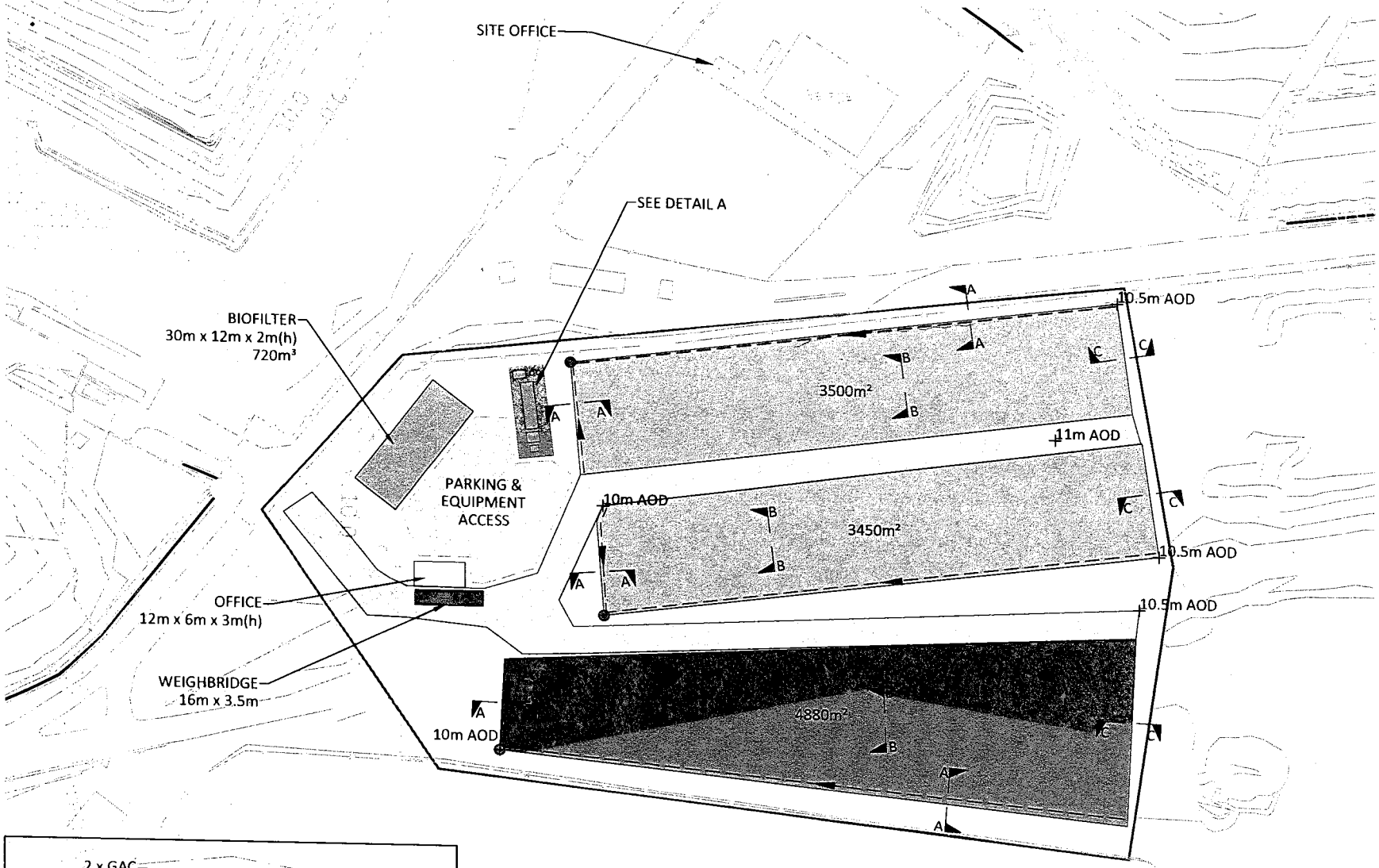
TITLE: SITE BOUNDARY PLAN

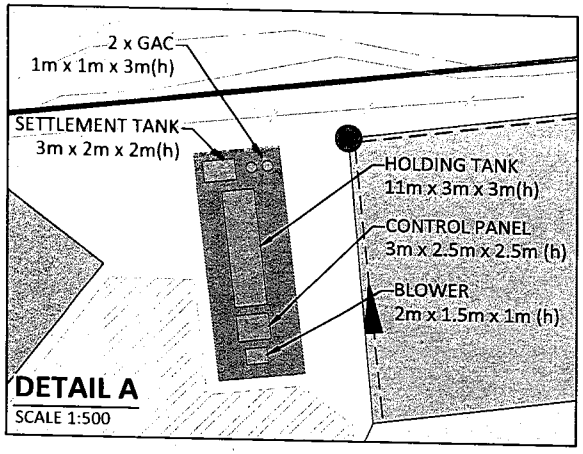
DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
17.12.2019	1:5000	3982	P1

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1804

Caulmert engineering environmental planning





DETAIL A
SCALE 1:500

SITE LAYOUT
SCALE 1:1000

NOTES

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- SECTION LINES
- BIOTREATMENT SCREENING AND PROCESSING AREA
- SCREENING / PROCESSING
- ACCESS ROAD
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P2	LEGEND UPDATED	EJD	KB	AS	24.03.20
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: fcc Environment

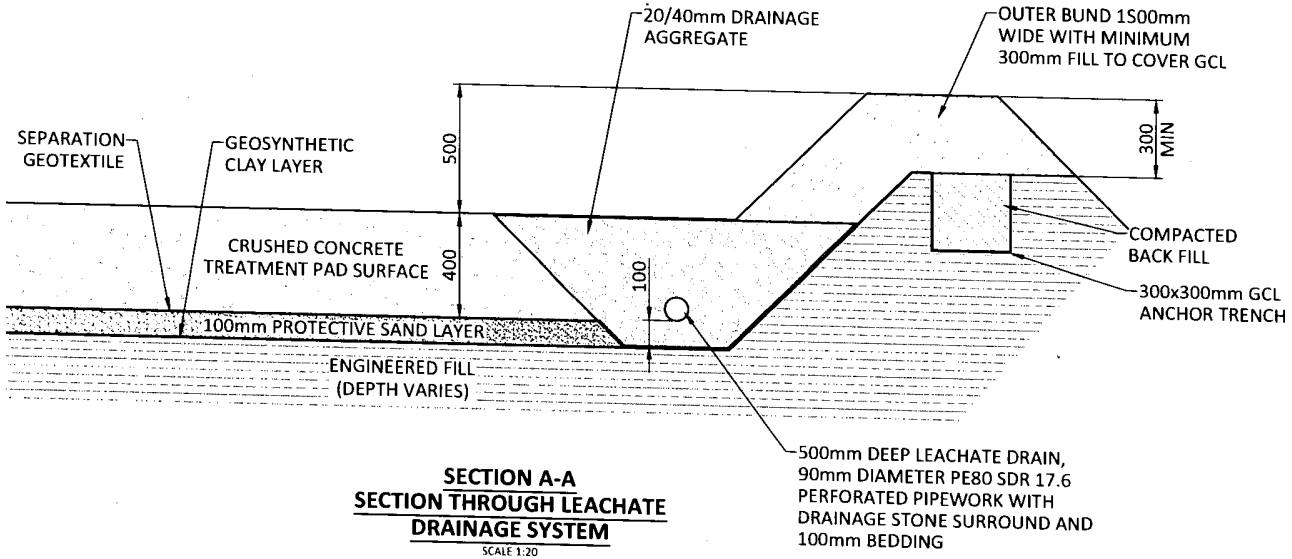
PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: PROPOSED LAYOUT PLAN

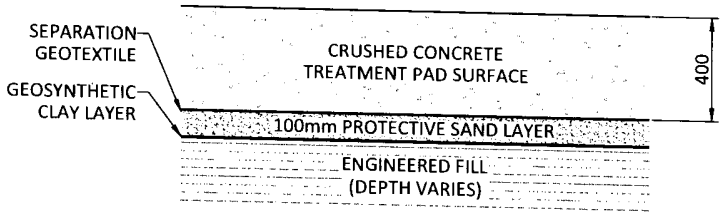
DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC
DATE	SCALE @ A3	JOB REF	REVISION
04.02.2020	AS SHOWN	3982	P2

DRAWING NUMBER: 3982-CAU-XX-XX-DR-1805

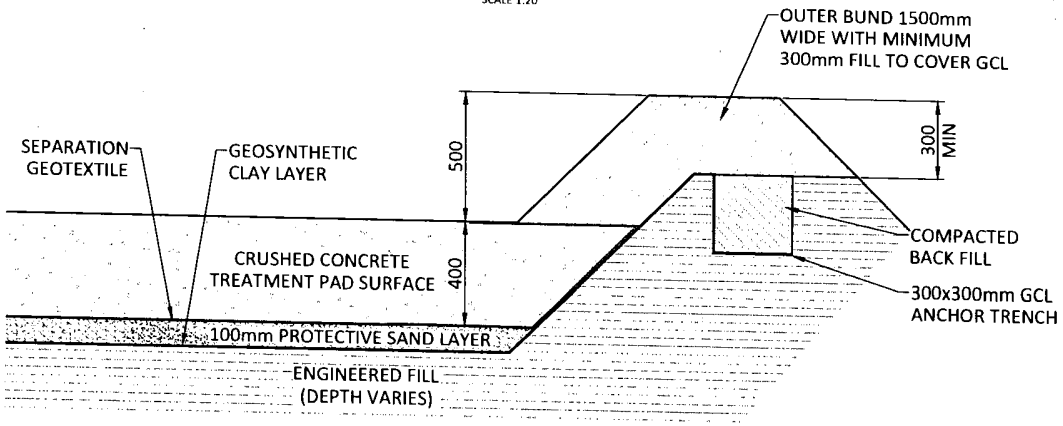
Caulmert engineering environmental planning



SECTION A-A
SECTION THROUGH LEACHATE DRAINAGE SYSTEM
SCALE 1:20



SECTION B-B
SECTION THROUGH TREATMENT PAD
SCALE 1:20



SECTION C-C
SECTION THROUGH TREATMENT PAD & EDGE BUND

NOTES

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3. SECTIONS POSITIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1805

REV					
P1	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

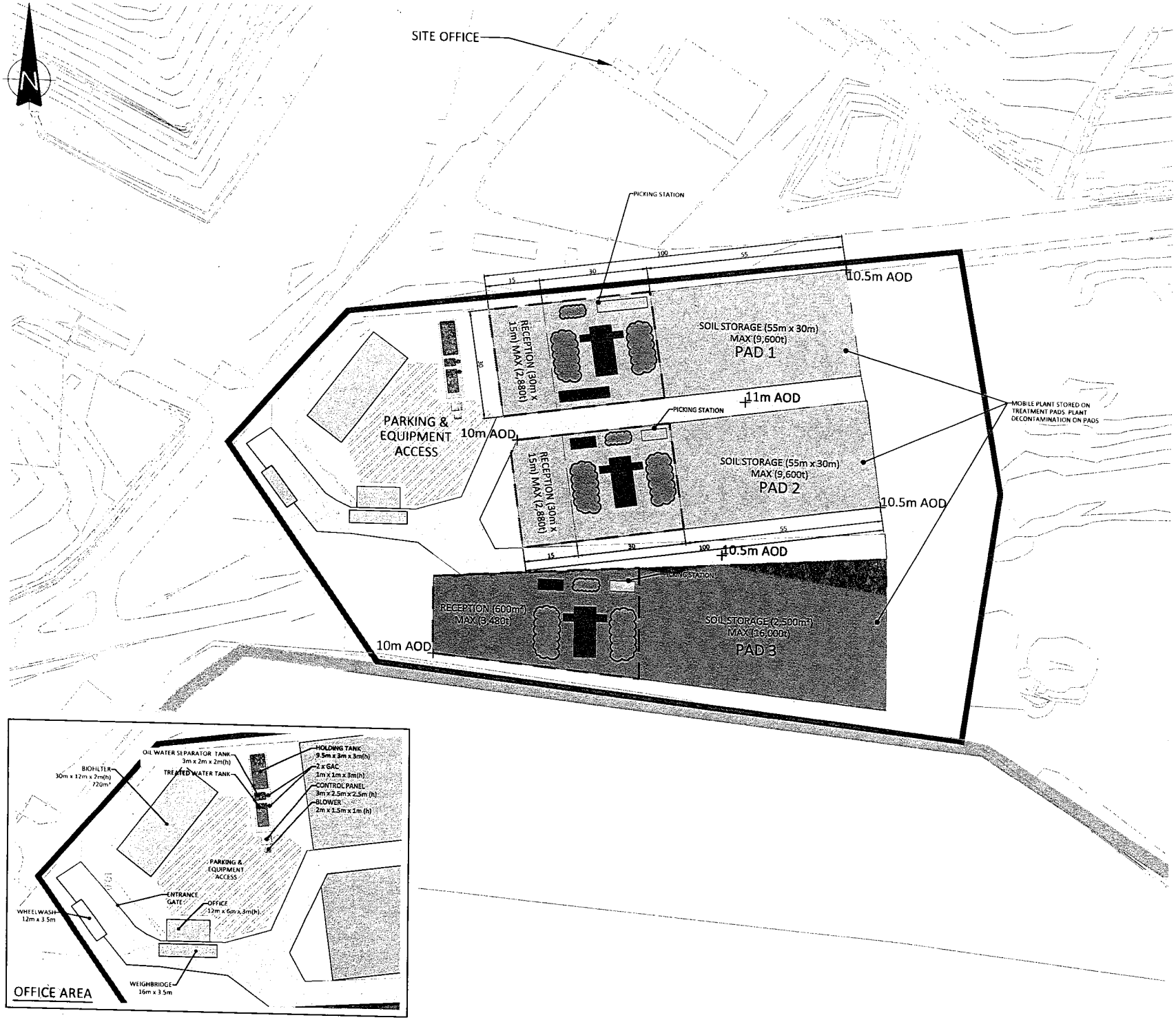
PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SECTIONS DRAWING

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC
DATE	SCALE @ A3	JOB REF.	REVISION
05.02.2020	AS SHOWN	3982	P1

DRAWING NUMBER: 3982-CAU-XX-XX-DR-C-1806

Caulmert engineering environmental planning



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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	WHEEL WASH POSITION AMENDED	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

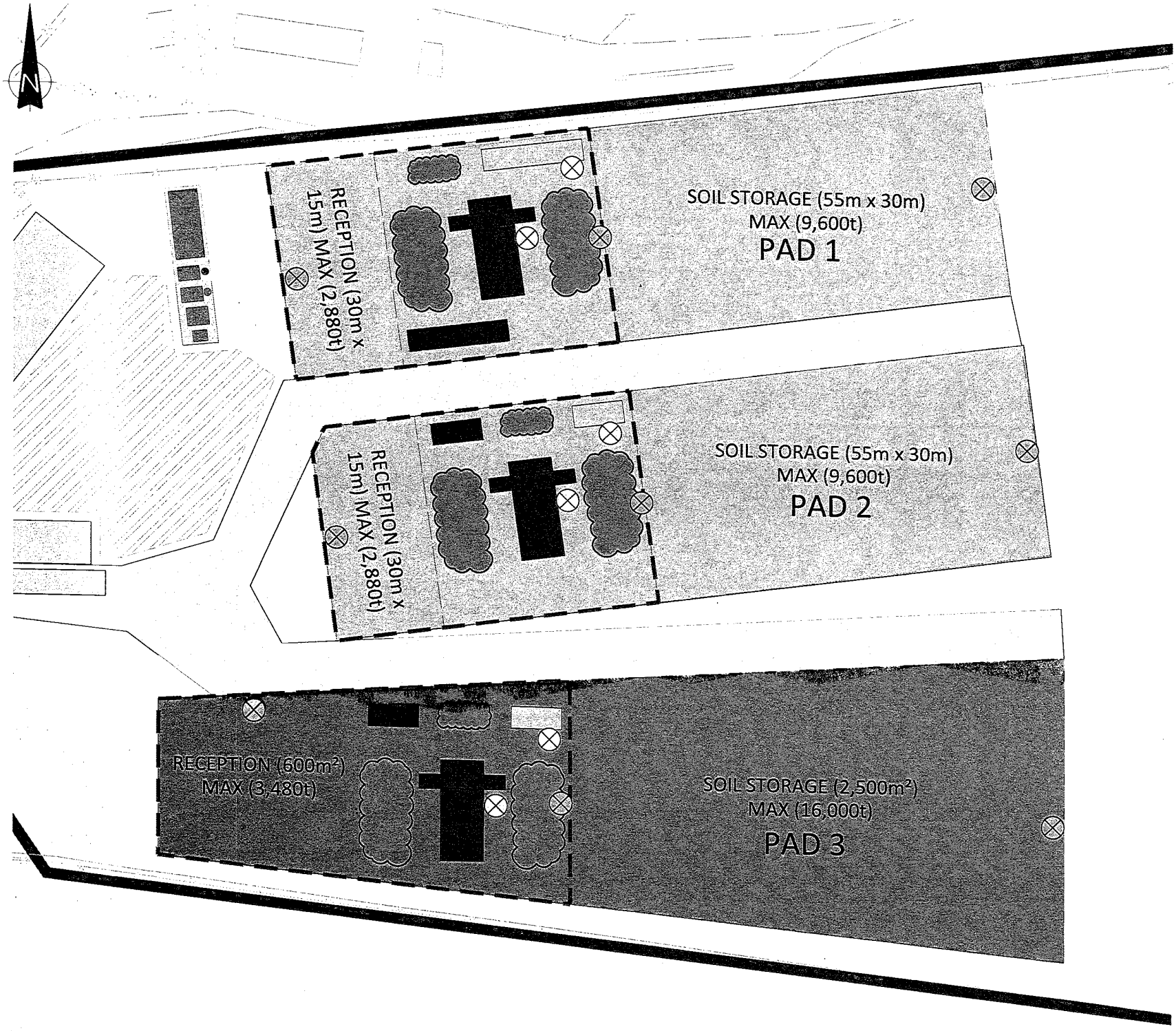
PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SOILS TREATMENT PADS 1 / 2 / 3 SITE LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF.	REVISION
29.09.2021	1:1000	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1807

Caulmert engineering environmental planning



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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- <0.0005f/ml ASBESTOS MONITORING POINT
- HAND HELD VOC's (PID) AND DUST MONITORING (NEPHELOMETER) LOCATIONS INCLUDING RECORD OF VISUAL DUST

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: EMISSIONS MONITORING PLAN FOR DUST, ASBESTOS AND VOC's PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF.	REVISION
29.09.2021	1:500	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1812

Caulmert engineering environmental planning

APPENDIX 1

CRS NI LTD

COMPLETE RECYCLING SYSTEMS

Specification
Ref: CRS-045-SITE MASTER

COMPLETE RECYCLING SYSTEMS

T: +44 (0) 28 8076 0496
E: Marketing@crsni.com
W: www.crsni.com

Office Address: 136 Termon Road, Carrickmore, County Tyrone,
BT79 9HW, N.Ireland

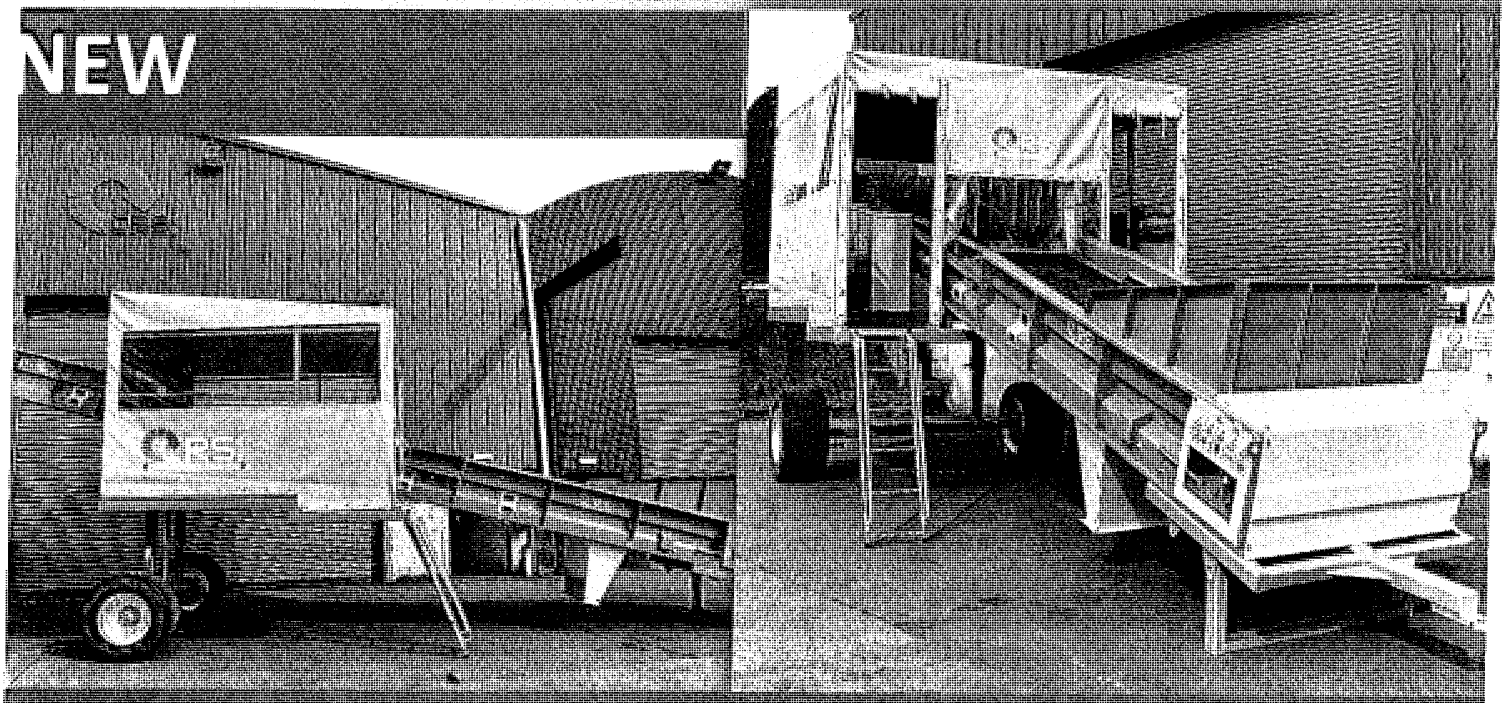
CRS NI LTD

COMPLETE RECYCLING SYSTEMS

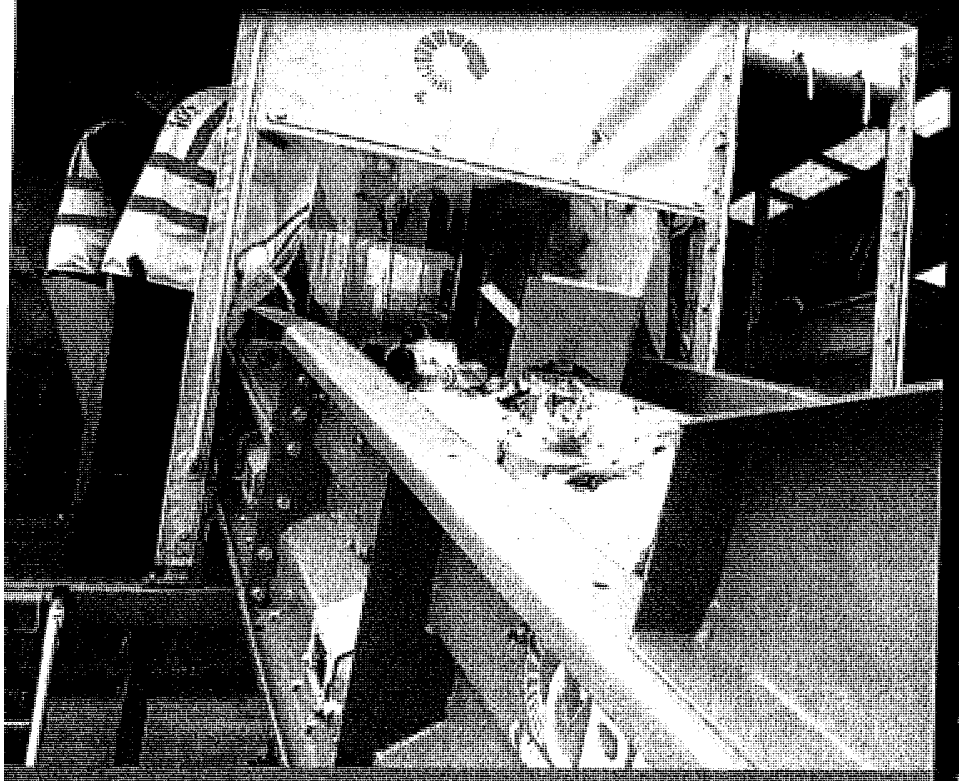
SALE OR HIRE

UNPARALLELED PERFORMANCE

NEW



Designed For Building & Construction Sites To Retrieve Valuable Products From Waste Reducing What Goes Into Your Skip.



Features & Benefits

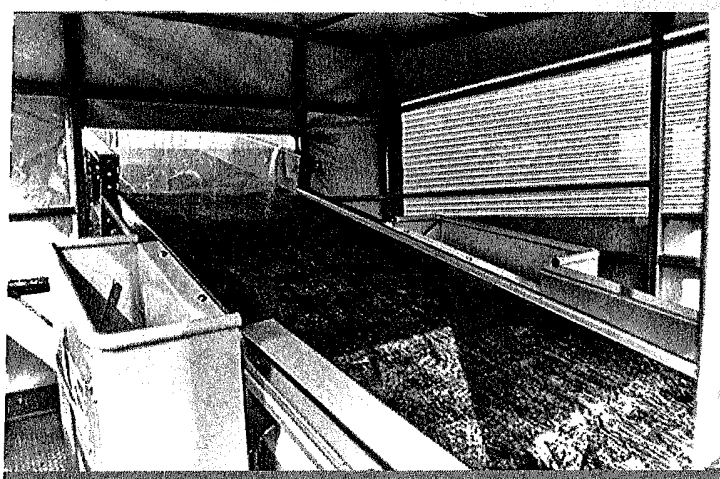
- Mobile 2 - 4 Man pick
- Designed for Building & Construction Sites
- Retrieve Valuable Products from waste
- Cut Down on what goes into your skip
- Adjustable Height
- Canopy for Weather Protection
- Economical Simple Design
- Electric Drive
- Robust & Heavy Duty Build

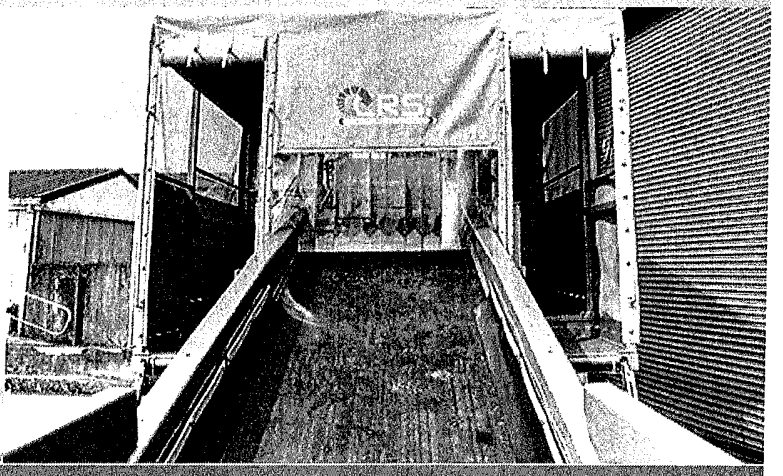
CRS NI LTD

COMPLETE RECYCLING SYSTEMS

SALE OR HIRE

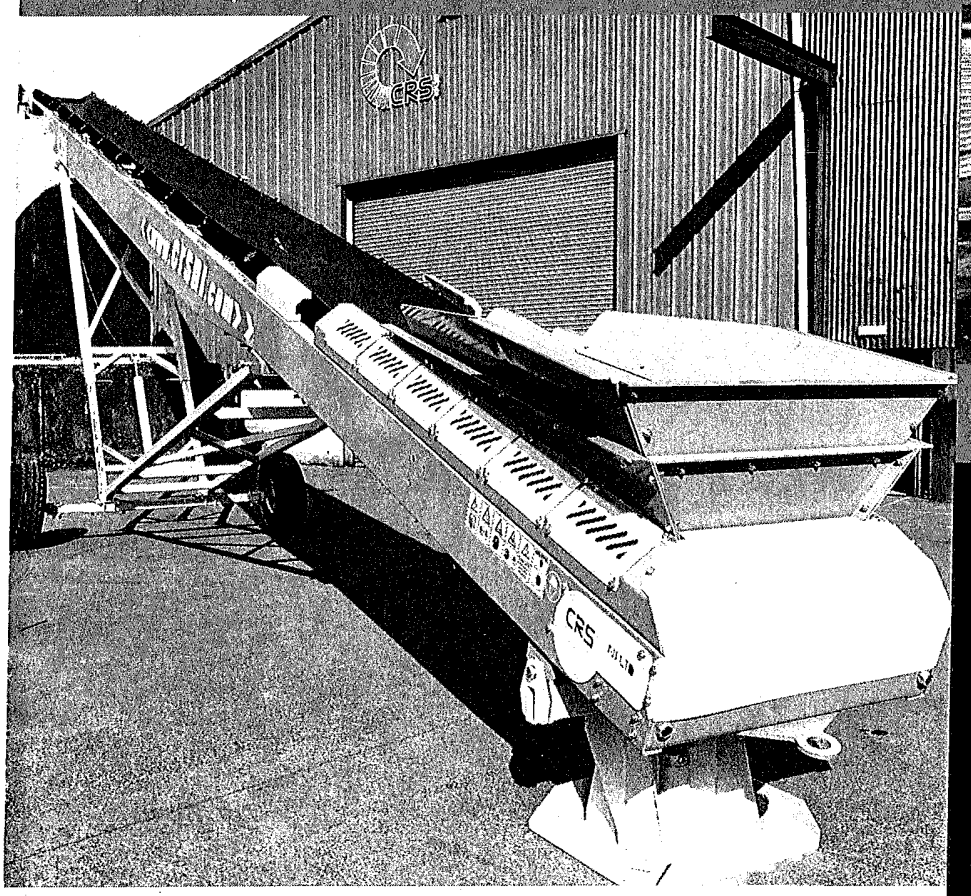
UNPARALLELED PERFORMANCE

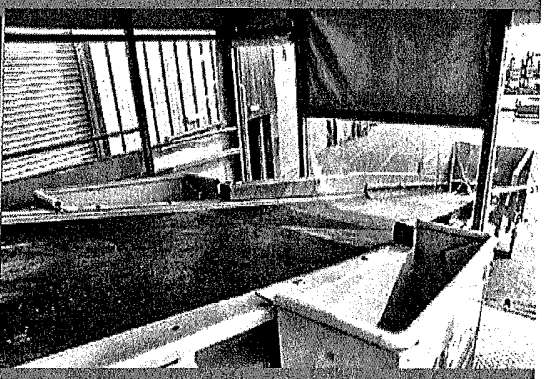




Fully Mobile
Easily Transported Around And Between Sites

•2 to 4 Man Picking
•Low Cost To Run





• Low Maintenance
• Reduce Skip hire cost

OPTIONS

- Hydraulic Drive
- Air Brakes
- Hard Cover
- Chevron Belt
- Radial Stockpiler

CRS NI LTD

Sales [illegible]

E sales@crsni.com

1.0 Conveyor

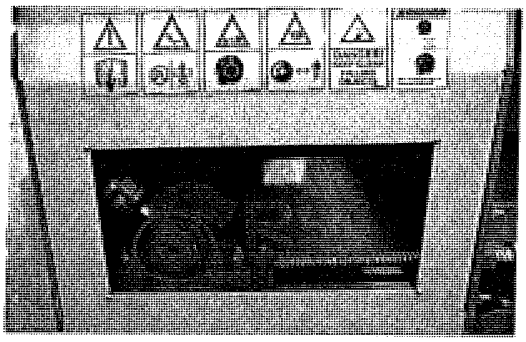
Feature

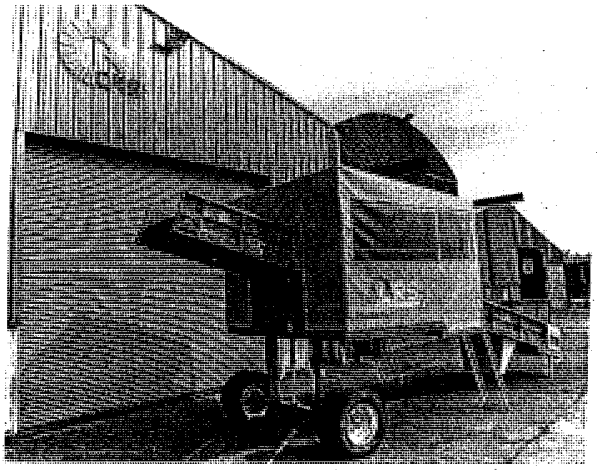
Heavy duty profile steel construction
Specially designed 8mm and 5mm steel profile to produce high strength section
Typically 3 times stronger than traditional 6mm channel designs

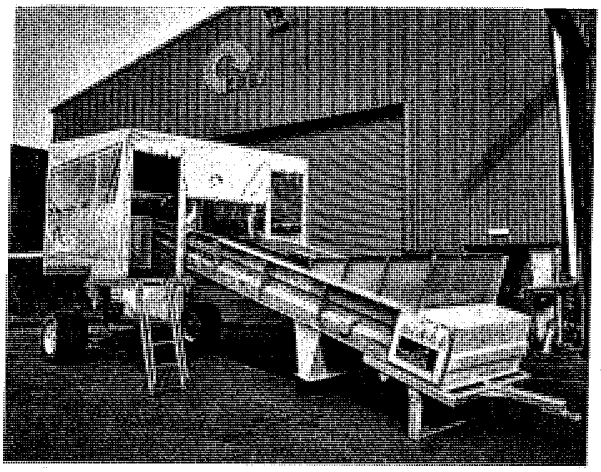
Technical Specification

1000mm wide heavy duty rubber belt
EP500/3ply – 5mm top cover 1.5mm bottom cover
8.5m drum centres

- 3.0kW Hi Torque Motovario slip on gear motor drive
- 100mm dia carry rollers placed at 875mm centres
- 100mm dia disc return rollers placed at 2115mm centres
- Head and Tail are fully enclosed to reduce spillage
- High sides incorporated into conveyor with skirting rubber
- Impact bars at infeed boot
- Plough scraper at Tail to reduce material build up
- SKF 50mm bearings (Tail)
- SKF 60mm bearings (Head)
- 288mm dia crowned and lagged drum
- 220mm dia crowned tail drum
- Rosta belt scraper tensioner with polyurethane rubber
- Perspex window at each maintenance point along conveyor
- Dirt chute at tail under plough scraper
- Support legs
- Full guards with emergency stops



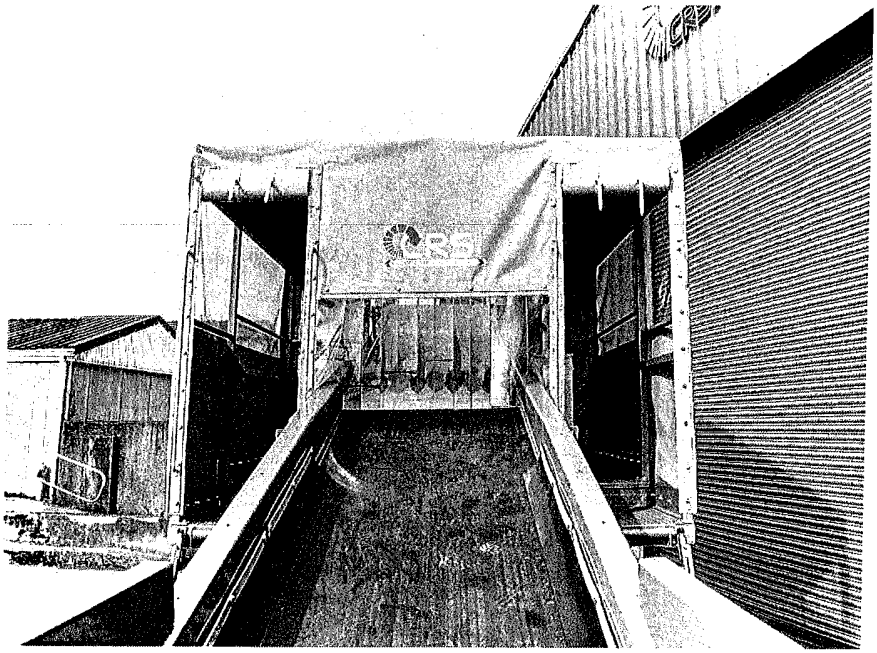


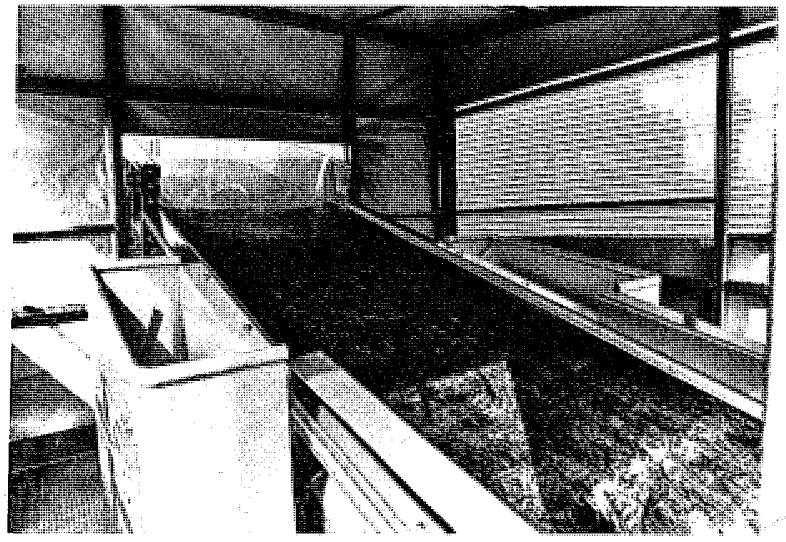


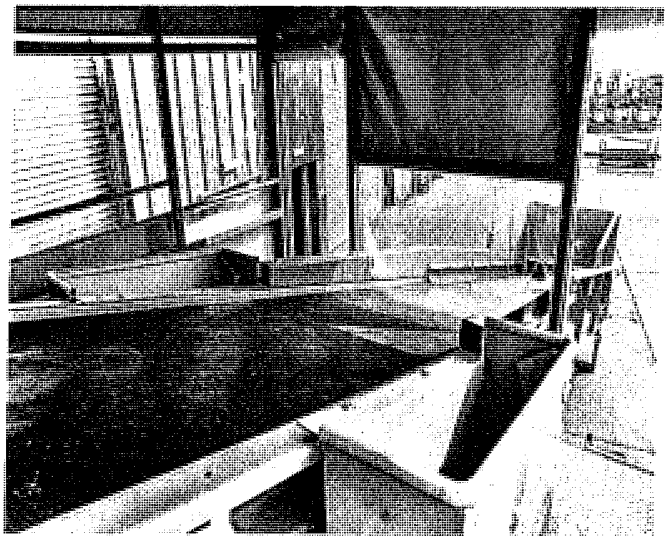
2.0 Picking Station

Feature

- 2-4 Man Picking
- 3.5mm Chequered Walkway
- 2 Dropboxes:
  - Width: 900mm
  - Depth: 452mm
  - Height: 989mm
- Access Step Ladders to Picking Station
- Canopy for Weather Protection
- Optional Hard Cover



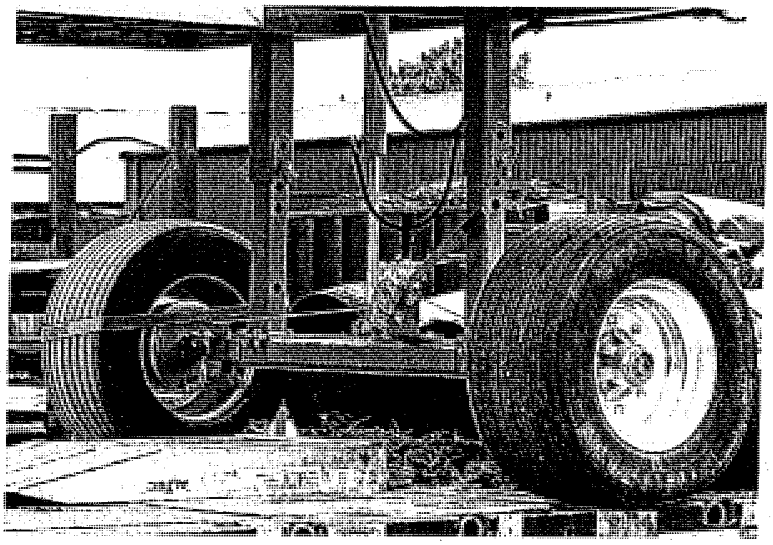




3.0 Wheel Assembly

Feature

- Adjustable Ram
- Handbrake Lever
- 300x80mm Stud Axle
- Super Single Tyres - 385/65 R22.5



APPENDIX 2

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: EVERGARD WETTING AGENT

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.3. Details of the supplier of the safety data sheet

Company name: SMH Products Ltd

SMH House

Maxwell Street

South Shields

Tyne & Wear

NE33 4PU

Tel: 0191 456 6000

Fax: 0191 456 7777

Email: enquiries@smhproducts.com

1.4. Emergency telephone number

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Aquatic Chronic 3: H412

Most important adverse effects: Harmful to aquatic life with long lasting effects.

2.2. Label elements

Label elements:

Hazard statements: H412: Harmful to aquatic life with long lasting effects.

Precautionary statements: P273: Avoid release to the environment.

P501: Dispose of contents/container to hazardous or special waste collection point.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

[cont...]

Hazardous ingredients:

STEOL CS-230

EINECS	CAS	PBT / WEL	CLP Classification	Percent
-	-	-	Eye Dam. 1: H318; Skin Irrit. 2: H315; Aquatic Chronic 3: H412	1-10%

PRIMARY ALCOHOL ETHOXYLATE

614-482-0	68439-46-3	-	Eye Dam. 1: H318; Acute Tox. 4: H302	<1%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so.

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Turn leaking containers leak-side up to prevent the escape of liquid. Mark out the contaminated area with signs and prevent access to unauthorised personnel.

[cont...]

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area. Avoid the formation or spread of mists in the air.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. The floor of the storage room must be impermeable to prevent the escape of liquids.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Workplace exposure limits: No data available.

DNEL/PNEC Values

Hazardous ingredients:

STEOL CS-230

Type	Exposure	Value	Population	Effect
DNEL	Dermal	2750	Workers	Systemic
DNEL	Inhalation	175	Workers	Systemic
DNEL	Oral	15	General Population	Systemic
DNEL	Dermal	1650	General Population	Systemic
DNEL	Inhalation	52	General Population	Systemic
PNEC	Fresh water	0.24	-	-
PNEC	Marine water	0.024	-	-
PNEC	Fresh water sediments	0.9168	-	-
PNEC	Marine sediments	0.0917	-	-

[cont...]

PNEC	Soil (agricultural)	0.946	-	-
PNEC	Microorganisms in sewage treatment	10	-	-

8.2. Exposure controls

Engineering measures: The floor of the storage room must be impermeable to prevent the escape of liquids.

Respiratory protection: Respiratory protection not required.

Hand protection: Protective gloves.

Eye protection: Safety glasses.

Skin protection: Protective clothing.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Colourless

Odour: Characteristic odour

Viscosity: Non-viscous

pH: 3.00

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.

Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

[cont...]

11.1. Information on toxicological effects

Hazardous ingredients:

STEOL CS-230

DERMAL	RAT	LD50	>2000	mg/kg
ORAL	RAT	LD50	>2000	mg/kg

PRIMARY ALCOHOL ETHOXYLATE

ORL	RAT	LD50	>200<2000	mg/kg

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

STEOL CS-230

ALGAE	48H EC50	27.7	mg/l
DAPHNIA	48H EC50	7.4	mg/l
FISH	96H LC50	7.1	mg/l

PRIMARY ALCOHOL ETHOXYLATE

FISH	96H LC50	1-10	mg/l

12.2. Persistence and degradability

Persistence and degradability: Not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: Bioaccumulation potential.

12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

[cont...]

12.6. Other adverse effects

Other adverse effects: Toxic to aquatic organisms. Toxic to soil organisms.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: H302: Harmful if swallowed.

H315: Causes skin irritation.

H318: Causes serious eye damage.

H412: Harmful to aquatic life with long lasting effects.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

[final page]

APPENDIX 3

STF – FO02 - SOIL RECEPTION PROCEDURE

Document No:	STF - RR - FO02	**Issue No:**	2
Author:	Jon Owens	**Approved By:**	Steve Langford
Issue Date:	19/01/18	**Approval Date:**	19/01/18

Introduction

This procedure relates to the measures to be undertaken for the assessment of data and inspection of waste received at the soil treatment facility. It allows rejection of non-conforming waste to ensure no contaminated soils are accepted which cannot be treated by the treatment facility to a standard suitable for reuse, or which breach the list of permitted wastes as shown in the site's Environmental permit.

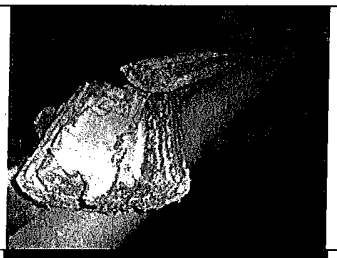
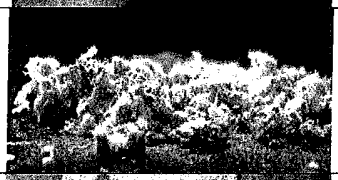
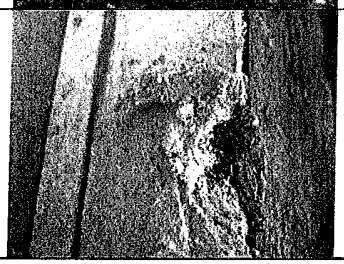
Principle of Operation

The inspection will allow the following to be assessed prior to acceptance:

1. Presence of untreatable and hazardous materials (e.g. tars, clinker, asbestos insulation etc.) in the contaminated soil.
2. Presence of excessive litter/debris in the contaminated soil.
3. Compliance with the previously supplied chemical/physical analysis information (supplied by waste producer).
4. Potential for the waste to behave as a liquid or have free water/oil in the waste

If the waste material is not compliant with the agreed conditions of the Environmental Permit and pre-acceptance assessment then the waste will be declined/rejected. As a note, the forms of untreatable asbestos described in point 1 are predominantly insulation products as follows in Table 1.

Table 1. Unacceptable Forms of Asbestos Insulation Products

Form of asbestos	Example
Asbestos pipe lagging	
Loose asbestos fill	
Asbestos insulation board (AIB)	

Procedure

Pre-Acceptance Assessment

This is undertaken by Provectus to confirm treatability to meet the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer including a clear statememt of any waste characterisation samples that are deemed untreatable. These are agreed in writing between the Waste Producer and Provectus prior to an authorisation number (contract line) being issued by FCC at the weighbridge for deposit at the Soil Treatment Facility.

Where data gaps exist or queries remain about the suitability of material for treatment, Provectus or FCC will offer to attend the site of origin to undertake pre-acceptance analysis and visually inspect the material and obtain further information about the waste description.

In the event that the moisture content of the waste being in the range of 25-30% then the potential for free water or oil will be further reviewed. Where moisture contents are at this level or even higher and the material does not behave as a liquid, have the potential for releasing water/oil etc and is suitable for the site infrastructure then it would be accepted on a case by case basis.

Should either Provectus, or after consultation, FCC determine that there is the high potential for material to contain untreatable inclusions or to behave as a liquid or contain free water or oil then the waste will be declined for acceptance.

Duty of Care Documentation

Duty of Care Documentation and other legal procedures (registration of hazardous waste site *etc.*) are completed between the Waste Producer and forwarded to FCC. No tipping on the STF will be permitted without relevant documentation from the waste producer. This must be checked on-site at the STF to ensure that the load is indeed destined for the STF, and that the documents are correctly completed. In the case of hazardous waste, the consignment note shall be filled in by a member of Provectus staff; and in the case of non-hazardous waste, the waste transfer note shall be inspected at the STF site office, and the load checked by a Provectus staff member at the STF.

Health and Safety

The site technician or PM is to provide guidance to the location for soil to be tipped, and any relevant safety information prior to tipping of soil.

Technicians and site personnel are to stand well away from the lorry when tipping so as to avoid any crush injuries/incidents as a result of being in close proximity to the tipping lorry. Any drivers must be informed of the requirement to wear a hard hat and high visibility vest when outside of the lorry cabin.

Lorries shall be informed to check that any waste/debris is removed from their lorry prior to leaving the STF.

Visual Inspection: Waste Input

The following locations will be used for accepting wastes:

- Hydrocarbons only: biopile treatment area
- Asbestos only, or asbestos and hydrocarbons: asbestos processing shed

The following plant and personnel are required as part of this procedure:

- Provectus STF Technician
- Excavator / loading shovel (if available)

Each load of soil for inspection will be tipped onto the nominated quarantine area by the tipper lorry. The technician will inform the tipper lorry driver to remain at the stockpiling area until the inspection has been completed.

In the event of the material containing free water or oil, the load will be immediately rejected.

In the event of untreatable forms of asbestos being present, the load will be immediately rejected

The excavator will be used to expose any unsuitable materials and allow a comprehensive visual assessment. The technician will determine the next action when this has been completed, this will comprise of the following:

- Waste is accepted and tipper lorry is permitted to leave the STF with the accompanying paperwork, or;
- Waste is not accepted and the unsuitable element of waste load, either partial or complete load is removed by excavator and placed back into the tipper lorry. A rejection form is filled in on-site and both Landfill Manager (LM) and Sales Manager (SM) are informed. It is the duty of FCC to inform the Environment Agency of any rejected loads.

At the end of the formal waste acceptance procedure the soil will be prepared for processing or biotreatment. Coordination of further treatment/processing events is to be decided by the Site Manager/Site Operator.

Chemical Analysis: Waste Input

Based on visual inspection, sampling frequency will be considered; this is in relation to the volume from each hazardous waste production site. Sampling will be undertaken on soils using composite sampling methods described in BS812.

The chemical analysis of soils generally takes 5-7 days to complete, therefrore limited storage times are required. Materials will be placed into treatment as soon as practicable from the receipt of chemical analysis and formal acceptance of the waste.

The range of contaminants for analysis will be based upon the original contaminating substances. A copy of the analysis shall be checked by the PM for verification against the original client data. In the event of non-conformity, the PM shall liaise with the LM and SM, and a decision on the next course of action will be taken.

For avoidance of doubt, the limits for asbestos from laboratory testing will be as follows:

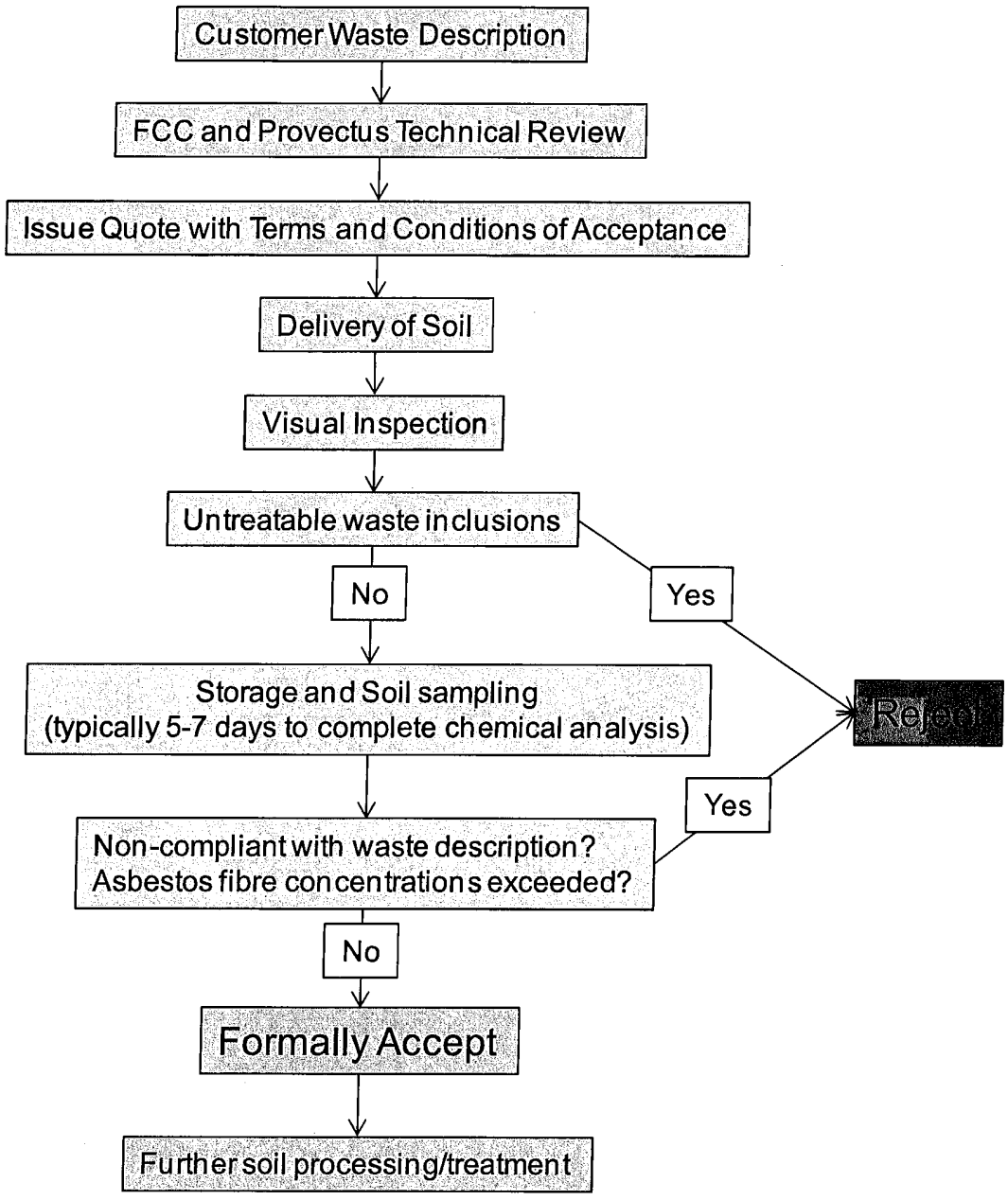
- Chrysotile only: 0.1%
- Other forms of asbestos (or chrysotile and others): 0.01%
- Asbestos debris limited to those which can be removed as Notifiable Non-Licensed Works (NNLW)

The waste will only be formally accepted once initial reception analyses is received in accordance with procedure STF PR02.

Summary of Waste Reception

Figure 1 is a flow diagram for the waste reception procedure. The procedure is implemented to ensure that the waste is only formally accepted once visual inspections and chemical analysis of received wastes has been successfully completed. This ensures that any soils that are formally accepted are suitable for further soil processing/treatment. All non-compliant wastes will be rejected.

Figure 1. Summary of Waste Acceptance Procedure



APPENDIX 4

The Airshed

Air Quality, Odour and Environmental Noise

Air Quality Impact Assessment
Proposed Soil Treatment Facility
at Daneshill Landfill
Lound Retford

Prepared by
The Airshed, 5 Lauder Place, East Linton
East Lothian EH40 3DB
Tel. 01620 860 529
mail@theairshed.com
www.theairshed.com
Registered in Scotland
Company No. SC309129

Record of changes

Version	Date	Change
1	18th December 2019	1st draft for internal review
2	8th January 2020	For client review
3	13th January 2020	Further and clarification of project description
4	2nd March 2020	Change to report title

Executive Summary

FCC Recycling (UK) propose to operate a new soil remediation facility on land at Daneshill Road, Lound, Retford DN22 8RB. The proposed facility is located in a rural area adjacent to a former landfill and current waste treatment facilities. The nearest established residential areas are Ranskill to the northwest, Torworth to the west and Lound to the east. There are isolated houses within 1km of the proposed facility, including the Travellers site at Daneshill Road.

The proposed bioremediation process will utilise industry standard bio-pile technology and will operate through the use of bio-piles and moisture control with extracted air treated in a bio-filter before being released to the atmosphere.

Caulmert Ltd, Environmental Consultants, has appointed The Airshed to conduct an air quality impact assessment (AQIA). The scope of this assessment is to consider the potential air quality impacts on human health from the emissions of VOCs. Dust impacts associated with the proposed facility are considered elsewhere.

The nearest sensitive receptors where long-term exposure is relevant is at the Travellers' site on Daneshill Road, ~280m to the south-east.

The airborne concentrations of pollutants have been predicted using ADMS 5.2, a widely used atmospheric dispersion model, using five years of hourly sequential meteorological data from RAF Scampton. The assessment considers the effects of these emissions on sensitive receptors in terms of Environmental Assessment Levels (EALs) for assessing human exposure. A single Scenario has been assessed:

- Scenario 1 considers emissions from the bio-filter assuming the maximum measured concentrations of VOCs reported at a similar site elsewhere.

The predicted concentrations of Benzene, Toluene, Ethylbenzene and Xylene are 0.0% of the relevant long-term and short-term EALs at the nearest sensitive receptors. The predicted air quality impacts from the proposed facility are insignificant.

Contents

TABLES

FIGURES

APPENDICES

Acronyms

AD	Anaerobic Digestion
ADMS 5	Air Dispersion Modelling System Version 5
AERMOD	Preferred dispersion model for USEPA
AOD	Above Ordnance Datum
AQIA	Air Quality Impact Assessment
AQMA	Air Quality Management Area
AQS	Air Quality Standards
As	Arsenic
BAT	Best Available Technique
C_6H_6	Benzene
$C_{20}H_{12}$	Benzo(a)pyrene
Cd	Cadmium
CERC	Cambridge Environmental Research Consultants
CLF	Critical Loads Function
CO	Carbon Monoxide
Co	Cobalt
CHP	Combined Heat and Power
Cr	Chromium
Cr_{VI}	hexavalent Chromium
Cu	Copper
°C	Degrees Centigrade
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency for England
EAL	Environmental Assessment Level
EIA	Environmental Impact Assessment (a process)
EQS	Environmental Quality Standard
ES	Environmental Statement (a document or series of documents)
FGT	Flue Gas Treatment
g/s	grams per second
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
Hg	Mercury
HHRAP	Human Health Risk Assessment Protocol
IED	Industrial Emissions Directive
IPPC	Integrated Pollution Prevention & Control Directive
K	degrees Kelvin
kW	kiloWatt
LNR	Local Nature Reserve
m/s	metres per second
m^3/s	cubic metres per second
mg/m^3	milligrams per cubic metre(10^{-3})
Mn	Manganese
MSW	Municipal Solid Waste
ng/m^3	nanograms per cubic metre (10^{-9})
NH_3	Ammonia
Ni	Nickel
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
O_2	Oxygen
OS	Ordnance Survey
Pb	Lead
pg/m^3	pico gram per cubic metre (10^{-12})
PM_{10}	Particles with aerodynamic diameter less than 10 microns
$PM_{2.5}$	Particles with aerodynamic diameter less than 2.5 microns
PC	Process Contribution
PEC	Predicted Environmental Concentration
Sb	Antimony
Sn	Tin
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TEQ	Toxic Equivalent (usually for dioxins and furans)
TG(16)	Technical Guidance Note for Local Air Quality revised in 2018
Tl	Thallium
tpa	tonnes per annum
ug/m^3	micrograms per cubic metre (10^{-6})
U_{10}	wind speed at measurement height – usually 10m above local ground level
USEPA	Environment Protection Agency (for the United States of America)
V	Vanadium
VOCs	Volatile Organic Compounds
WwTP	Wastewater Treatment Plant
WID	Waste Incineration Directive
Zn	Zinc

Prediction is very difficult, especially about the future.
Niels Bohr, Danish physicist (1885 - 1962)

1.0 INTRODUCTION

Background to Report

1.1. FCC Recycling (UK) Ltd who are a wholly owned subsidiary of FCC Environment (UK) Ltd, propose to operate a new soil remediation facility on land at Daneshill Road, Lound, Retford DN22 8RB. The proposed facility is located in a rural area adjacent to a landfill and other waste treatment facilities. The proposed facility is located in a rural area where the nearest established residential areas are Ranskill to the northwest, Torworth to the west and Lound to the east. There are isolated houses within 1km of the proposed facility including the travellers site at Daneshill Road. The site location is shown in Figure 1.

1.2. The proposed bioremediation process will utilise industry standard bio-pile technology and will operate through the use of bio-piles and moisture control; addition of suitable nutrients to the soil and forced air extraction to encourage micro-organism growth leading to the breakdown of hydrocarbons into by products such as carbon dioxide and water vapour. Soils will typically be treated over an 8-16-week period, with the material being turned infrequently, typically once every 8 weeks. The bio-piles will be placed on water and air extraction pipes connected to a blower that will draw air through the soils. The extracted air is then passed through a bio-filter before being discharged to the atmosphere. Excess water draining through the soils will be collected and treated to remove any oils or suspended solids. Further details on the project description are presented in Appendix 1.

1.3. Caulmert Ltd, Environmental Consultants, has appointed The Airshed to conduct an air quality impact assessment (AQIA). The scope of this assessment is to consider the potential air quality impacts on human health from the emissions of VOCs. Dust impacts associated with the proposed facility are considered elsewhere.

Table 1.1 – Sensitive Receptors – Human Health (selected <2km)

No.	Location	OS x	OS y	Distance (m)
1	Travellers Site	467595	386491	279
2	Daneshill Cottage	467047	386590	474
3	House to east	468272	386638	788
4	Mattersey Road	468558	386067	1265
5	Lound	468895	386146	1528
6	Lound	469046	386531	1568
7	North View	469083	387159	1641
10	Mattersey Hill	468172	388578	1949
11	Lakeland House	467346	388611	1865
12	Mattersey Road	466777	388399	1797
14	Maltkiln Cottage	466239	387768	1614
15	Willow Avenue	466196	387589	1544
16	Lakeside Fishery	466351	387458	1344
17	Underwood Avenue	465818	387047	1701
18	Moat Farm	465851	386645	1645
19	Torworth Grange	465970	386001	1698
20	College Farm	466102	385473	1889

(N.B. distances are from the centre of the bio-filter)

1.4. The locations of the sensitive receptors considered in the study are shown in Figure 1 and receptor locations are presented in Table 1.1 above. The nearest receptor location is the Travellers' site 279m to the southeast of the proposed bio-filter.

Scope of Air Quality Impact Assessment

1.5. This assessment considers the potential adverse air quality impacts from the proposed facility on human receptors. The main pollutants of concern are Benzene, Toluene, Ethylbenzene and Xylene. This assessment is based on the assumption that the contaminants in the soils to be used at the facility will be similar in character to those tested at the Edwin Richards Quarry.

1.6. This study is intended to help determine the likely effects of the emissions on adjacent receptors. The dispersion model used in this study, ADMS 5.2, has been widely validated. Experience has shown that the model is conservative, so that it will tend to over-predict, provided the source estimates are accurate.

1.7. The assessment considers the effects of the emissions from the facility in terms of environmental assessment levels (EALs).

Report Structure

1.8. Section 2 discusses relevant air quality standards, and English and European Regulations and Guidance relating to air quality assessment criteria.

1.9. Section 3 describes the pollutant emission rates for the WwTP. The section also discusses the baseline air quality conditions around the installation, taking account of the character of the emissions.

1.10. Section 4 sets out the reasons for the approach to assessment and details the assumptions made in the dispersion model.

1.11. The results from the dispersion modelling are presented in Section 5.

1.12. Proposed mitigation measures are outlined in Section 6.

1.13. The significance of the residual emissions is presented in Section 7.

2.0 RELEVANT LEGISLATION AND STANDARDS

Introduction to Section 2

2.1. This section discusses relevant Guidance relating to the installation.

Environmental Assessment Levels

2.2. The Environment Agency (EA) has published Guidance[1] that proposes a simple screening approach where the predicted process contribution (PC) long-term concentrations of pollution may be regarded as insignificant where the PC <1% of the EAL. PC <10% of the EAL is insignificant for short-term concentrations. The relevant EALs for this assessment are set out in Table 2.1 below. Odour impacts are considered separately.

Table 2.1 – Environmental Assessment Levels (Human Exposure)

Pollutant	Long term	Short term
	ug/m^3	ug/m^3
Benzene	5	-
Toluene	1,910	8,000
Ethylbenzene	4,410	55,200
Xylene	4,410	66,200

N.B. columns are blank where there is no relevant EAL.

EA Guidance for Odour

2.3. The EA has issued Guidance on odour assessment[2] for processes that are subject to the Environmental Permitting Regulations (H4). The EA's odour criteria are based on the 98%ile of hourly averages in a typical year. This allows for atypical odour emissions or poor dispersion caused by unfavourable weather conditions around 175 hours over a year. According to this Guidance, odour from the most offensive odours, which is likely to include leachates, should be less than 1.5 OU_E/m^3 1 hour 98%ile at sensitive receptors. These criteria are quantified using dynamic olfactometry in accordance with British Standard, BS 13725:2003.

2.4. H4 advises that odours from different processes within the same installation are not necessarily equally offensive and that this should be taken into account. This assessment assumes that an odour benchmark of 1.5 OU_E/m^3 1 hour 98%ile will apply.

BS EN 13725 : 2003

2.5. The use of odour units, based on human response to odour rather than chemical speciation, presumes that human response to odour can be quantified scientifically. The European Standard for measurement of odour concentration, BS EN 13725 : 2003[3] specifies the sampling and analytical procedures for dynamic olfactometry and the quality assurance requirements for repeatability of results. Based on this type of sampling method, the limit of detection for 50% of the test panel is 1 OU_E/m^3. Odour units are not a measurement of concentration, but rather a ratio of

[1] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions
[2] Environment Agency March 2011. H4 Odour Management. How to comply with your permit.
[3] BS EN 13725 : 2003. Air quality. Determination of odour concentration by dynamic olfactometry.

the number of dilutions required to reduce an odour to where it cannot be detected by 50% of the odour test panel.

Where Should EALs and Odour Benchmarks Apply?

2.6. Air quality standards should apply to all locations where members of the public may be reasonably likely to be exposed to air pollution for the duration of the relevant objective. Thus short-term standards intended to prevent exposure to toxic air pollutants with acute effects should apply to footpaths at site boundaries and other areas which may be frequented by the public even for a short period of time.

2.7. Longer term exposure and odour benchmarks should only apply at houses and gardens or other locations which the public can be expected to occupy on a continuous basis.

2.8. The receptors used in the modelling assessment are shown in Figure 1. The predicted impacts at these receptor locations are concerned with air quality impacts on human health and amenity.

2.9. This assessment assumes that odour benchmarks around the proposed installation should only apply to residential areas, or other locations which members of the public are likely to occupy over an extended period of time; and that pedestrians on footpaths and people on roads adjacent to the site are not sensitive to odour. All dwellings are considered to be highly sensitive receptors as defined by the IAQM 2014 Odour Guidance[4].

Assessment Framework

2.6. The assessment framework used to assess the significance of air quality impacts is set out in Table 2.2 below. This is based on DEFRA/EA Guidance[5] and the EA's informal pragmatic risk assessment method. These assessment criteria only apply to EALs and do not apply to the assessment of odour.

Table 2.2 - Air Quality Impact Assessment Criteria (Annual Mean at Receptors)

Predicted Impact	Adverse Significance	Justification
Greater than air quality limit value or objective	Major	Exceeding any air quality limit value would be unacceptable in terms of human health, or where the impact would have significant adverse ecological impacts.
Process Contribution >30% of EAL	Moderate	Risk based approach advocated by Environment Agency taking account of model headroom and uncertainty.
Process Contribution <30% of EAL	Minor/Moderate	Risk based approach advocated by Environment Agency taking account of model headroom and uncertainty.
Process Contribution <10% of EAL	Minor	Based on rule of thumb (factor of 10)
Process Contribution <1% of EAL	Insignificant	This is the assessment criteria proposed by EA as a screening method which states that process contributions can be considered insignificant if the long-term process contribution is <1% of the long-term environmental standard.

[4] IAQM 2014. Guidance on the assessment of odour for planning.
[5] Air emissions risk assessment for your environmental permit https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions

3.0 BASELINE AIR QUALITY AND PROCESS EMISSION INVENTORY

Emission Inventory for the AQIA

3.1 The emission estimates for the soil treatment facility assumes that all emissions are released from the surface of the bio-filter and ignores any fugitive emissions from the stockpiles and screening and grading operations.

3.2 Details of the emission rate from the bio-filter are presented in Table 3.1 at the end of the text.

3.3 A single emission Scenario has been considered for the assessment:

- Scenario 1 is based on the maximum measured concentration from a similar installation elsewhere.

Baseline Air Quality

3.4 The only available baseline estimates for Benzene in the study area are from DEFRA modelled projections based on work conducted in 2001. This indicates that the annual mean exposure to Benzene in air within the study area was up to 0.275ug/m^3 for the year 2010.

4.0 DISPERSION MODELLING

Introduction to Section 4

4.1. This Section sets out the reasons for the approach to assessment and details the assumptions made in the dispersion modelling.

Justification for Approach

4.2. The likely impact from process emissions may be estimated using an appropriate atmospheric dispersion model and reliable emission estimates. The emissions from the process for Scenario 1 are based on worst-case emission concentrations measured at a similar facility elsewhere.

4.3. The objective of the dispersion modelling assessment is to predict the likely effect of the prevailing climate, local surface conditions and topography on plume behaviour; and to predict the likely worst case airborne concentrations at sensitive receptors around the facility.

4.4. The pattern of pollutant dispersion may be estimated using several years of historical meteorological data from a representative site. Air quality impacts are assessed against Environmental Assessment Levels.

4.5. The assessment ignores the impacts from fugitive emissions. This is contingent on appropriate measures being adopted at the site to prevent or minimise fugitive releases.

Approach to Modelling Uncertainty

4.6. Environment Agency policy statement[6] refers to the Royal Meteorological Society Guidelines on Dispersion Modelling. According to this Guidance, dispersion modelling studies should include a Sensitivity Analysis for model inputs to provide an estimate of the possible errors in the predictions. The Environment Agency has also published requirements for dispersion modelling.[7] This includes advice on the Agency's requirements for reporting. These Guidance documents have been taken into account in the assessment.

4.7. A widely recognised mathematical model (ADMS 5.2) has been used to predict how emissions will be dispersed taking account of: the source conditions (using emission factors and the flow rate and pollutant concentrations); release conditions (efflux velocity and temperature); meteorological conditions from a representative site (in this case near ground measurements at RAF Scmpton supplied by the Met Office); building effects and surface conditions (surface roughness).

4.8. ADMS 5.2 has been developed specifically for industrial point sources.[8] The model is widely used in the UK for environmental assessment and is

[6]Environment Agency, undated. Policy Statement EAS/2007/1/1
[7]Environment Agency, undated. Air Dispersion Modelling Report Requirements (for detailed dispersion modelling).
[8]CERC 2016. ADMS-5, The Multiple Source Air Dispersion Model. CERC, Cambridge.

generally considered by UK environmental agencies to be suitable for air quality impact assessment subject to its proper use.

4.9. Potential difficulties and limitations in this type of study when applied to air quality impact assessments include:

- Lack of good information about the risk to human health from process emissions. This assessment relies on the Environmental Assessment Levels (EALs) published by the Environment Agency;
- Uncertainties in baseline conditions. The baseline estimates used take account of available background estimates published by DEFRA;
- Errors in source terms used to estimate emissions. Emission rates are based on worst-case measured pollutant concentrations at a similar site elsewhere and air flow estimates provided by the operator;
- Errors inherent in the dispersion model used. The model is considered to be suitable for use in this application and has been validated for area sources; and
- Errors introduced by the model user due to the use of inappropriate or unrepresentative input values such as meteorological data or surface roughness values. A Sensitivity Analysis has been conducted to take these potential errors into account. The significance of these factors is discussed in Section 5. In general the approach used in this assessment has been to include worst case factors where these may otherwise lead to underestimates of worst case conditions.

4.10 This assessment presents a detailed account of the modelling process and considers the model sensitivity to the main user inputs. An inventory of the models run for this project is presented in Table 4.1 at the end of the text.

Dispersion Modelling

4.11 The transport and transformation of a pollutant in the boundary layer,[9] can be predicted with a reasonable degree of confidence using an appropriate mathematical model. The model used for this exercise is ADMS 5.2. This mathematical model enables the calculation of multiple sources and includes an algorithm for assessing flow around buildings that may cause entrainment. The principal factors affecting the concentration of a pollutant are:

- Source characteristics including source strength, height of discharge, density, and temperature of the release;
- Prevailing atmospheric conditions including wind speed, wind direction, cloud cover, precipitation, ambient temperature and the depth of the boundary layer; and

[9]The boundary layer is the layer of the atmosphere near the surface of the Earth that is affected by mechanical turbulence from surface friction and convective turbulence through local surface heating.

- Adjacent topography and local surface conditions.

These factors can be assigned numerical values and the resultant downwind concentrations of pollutants may be predicted.

4.12 The model description is published in the user guide for ADMS 5.2. The model was originally developed as a research project jointly funded by HSE, the Met Office and Her Majesty's Industrial Inspectorate of Pollution. The model is routinely used by UK environment agencies.[10]

Model Parameters

4.13 The temperature and efflux velocity of the stack gases are based on engineering estimates provided by the supplier. The emissions from the process are summarised in Table 4.2 in accordance with the requirements of H1[11] and Environment Agency Guidelines.

Source Condition, Location and Height

4.14 The emissions have been considered as continuous, steady state area source near ground level. The location of the proposed bio-filter is shown in Figure 2. The bio-filter release is assumed to be 1m above local ground level. The flow from the bio-filter has been modelled as a zero volume, zero velocity release.

4.15 The details of the proposed facility were obtained from the site planning drawings and the OS map base at 1:1250 and 1:10,000 scales.

Surface Roughness

4.16 The surface roughness conditions at the site have been assumed to have a surface roughness value of 0.5m as this is considered to represent worst case conditions for dispersion. This value has been used across the domain.

Meteorological Data

4.17 The selection of suitable meteorological data needs to be conducted with care. The main limiting factor for suitable meteorological data is continuous observations of cloud cover, used in the model to determine atmospheric stability.

4.18 Five years of hourly sequential meteorological data from RAF Scampton (2012 - 2016 inclusive) have been used to predict the dispersion around the site. Monks Wood is 34km to the south of the proposed installation and is likely to be reasonably representative of conditions at the study area. The worst case one year in five has been used in the assessment. A summary of the meteorological data is presented in Appendix 2. A model sensitivity analysis has also been conducted using 5 years of hourly sequential meteorological data for Wittering (2014 - 2018), which is

[10]Details of model validation studies are available at http://www.cerc.co.uk/software/publications.htm
[11]Environment Agency December 2011. H1 Risk Assessment Annex F v2.2

~29km to the south-east. Theses data has been used to assess worst case impacts for long-term exposure.

Building Effects

4.19 The release at near ground level so that building effects on dispersion have been discounted.

Terrain Effects

4.20 The land near the proposed installation is relatively level across the site, with only minor variations in ground level across the study area. The local topography is plotted in Figure 3. Terrain effects are unlikely to affect air flow and dispersion. Terrain effects have therefore been taken into account as a precaution.

Time Averaging and Percentiles

4.21 The averaging time for all pollutants is based on a 1 hour average. The 1 hour 100%ile has been calculated for pollutants where appropriate. Odour has been predicted using the 1 hour 98%ile and 100%ile.

Grid Resolution and Receptors

4.22 Predictions have been made at 20 fixed point receptor locations around the site to represent exposure at existing receptors and to assist with the model Sensitivity Analysis. These receptor locations are shown in Figure 1. The predictions have been modelled at a height of 1.5m above ground level.

4.23 Predictions have also been provided over the study area on a grid 43 by 36 at intervals of 100m where x1 = 465000; y1 = 385200; x2 – 469800; and y2 = 388700.

Removal Effects

4.24 Atmospheric chemistry and photo-lytic reactions have been ignored in the dispersion modelling.

Overview of the Modelling Process

4.25 Details of the ADMS dispersion model runs are presented in Table 4.1 at the end of the text.

5.0 IMPACT ASSESSMENT RESULTS

Model Sensitivity Analysis

5.1. It is a requirement of the Royal Meteorological Society Guidelines on Dispersion Modelling[12&13] that studies should include a Sensitivity Analysis for model inputs, to provide an estimate of the possible errors in the predictions. The potential errors in predictions and limits to the dispersion model were outlined in Section 4. The Sensitivity Analysis conducted for this study is based on the findings of the model sensitivity analysis. The results for the model sensitivity analysis are presented in Appendix 3. The model predictions are based on the worst case one year in five, and allow for topography effects and worst case surface roughness conditions.

Results – Human Health

5.2. The predicted contours for airborne Benzene for Scenario 1, excluding background, are plotted in Figure 4. This indicates that the predicted annual mean concentration of Benzene is below the significance threshold of 1% of the EAL for human exposure. The predicted concentrations for all pollutants at sensitive receptors are included within Appendix 3 and summarised in Table 5.1 below.

Table 5.1 - Worst Case Predicted Levels at Sensitive Receptors (Scenario 1)

Pollutant	Long-term	Short-term
	ug/m^3	ug/m^3
Benzene	0.00031	0.0534
Toluene	0.00495	0.8545
Ethylbenzene	0.00046	0.0790
Xylene	0.00124	0.2136

5.3. These predictions are based on worst case dispersion conditions for meteorology and surface roughness. The criteria used to assess the significance of pollutants were presented in Table 2.2. The significance of these predicted concentrations may be determined from Table 5.2 below, where the predicted process contribution is expressed as a percentage of the Environmental Assessment Level. Impacts are insignificant where the process contribution is <1% of the long-term EAL.

Table 5.2 – Significance of Worst Case Predicted Levels at Sensitive Receptors

Pollutant	Long term	Short term
	ug/m^3	ug/m^3
Benzene	0%	-
Toluene	0%	0%
Ethylbenzene	0%	0%
Xylene	0%	0%

N.B. columns are blank where there is no relevant EAL. (Scenario 1)

[12]Royal Meteorological Society May 1995. Policy Statement Atmospheric Dispersion Modelling. Guidelines on the justification of choice and use of models and the communication and reporting of results
[13]ADMLC 2004. Guidelines for the Preparation of Dispersion Modelling Assessments for Compliance with Regulatory Requirements – an Update to the 1995 Royal Meteorological Society Guidance

5.4. This indicates that the process contributions are predicted to be well below the relevant EALs.

Model Headroom

5.5. The Environment Agency's method for assessing model uncertainty[14] indicates that confidence in the model is high for both short and long-term exposure based on Benzene (assuming Scenario 1 emissions).

Results - Odour

5.15. The predicted odour at the nearest sensitive receptors are well below the odour detection threshold for all pollutants.

[14] Ji Ping Shi and Betty Ng; 2004. Risk based pragmatic approach to address model uncertainty. Air Quality Modelling and Assessment Unit The Environment Agency 29 Newport Road Cardiff CF24 0TP. Paper Given At NSCA Seminar.

6.0 PROPOSED MITIGATION MEASURES

Operational Impacts

6.1 The following measures are proposed to prevent or minimise impacts on air pollution:

- The waste acceptance criteria for the proposed facility shall ensure that only suitable materials are deposited within the aerated static piles.
- The air stream into the bio-filter shall be cleaned to prevent dust loading into the filter media.
- The condition of the bio-filter bed shall be tested on a monthly basis to ensure satisfactory performance.
- Supervisory staff shall be trained to ensure that the facility is operated within specification.
- All process operations shall be subject to routine planned preventative maintenance.
- Environmental monitoring shall be conducted to confirm the pollutant concentrations are within the assumed levels and to ensure compliance with Environmental Assessment Levels.

7.0 EVALUATION OF IMPACTS

Human Exposure

7.1 The assessment takes account of the worst case model predictions, the relevant Environmental Assessment Levels (EAL) and the significance criteria set out in Tables 2.1 – 2.2.

7.2 The predicted impacts from the proposed facility are insignificant at all sensitive receptors in terms of the assessment framework set out in Table 2.2, where all pollutants are <1% of the EAL.

7.3 Odour impacts from the proposed facility are predicted to be negligible.

Tables

Item	Description	dimensions [1] m^2	volume of air [2] $m3/s$	pollutant [3]	maximum reported concentration [4] ug/m^3	maximum emission rate [5] g/s	maximum emission rate [5] $g/m^2/s$
1	bio-filter surface	475	2.778	Benzene	10	2.778E-05	5.848E-08
				Toluene	160	4.444E-04	9.357E-07
				Ethlbenzene	14.8	4.111E-05	8.655E-08
				m/p-Xylene	30	8.333E-05	1.754E-07
				o-Xylene	10	2.778E-05	5.848E-08

Notes

1. from drawing Daneshill No. 1. Provectus FCC Environment Provisional Layout September 2019
2. Email from Jon Owens Provectus to Andy Stocks Caulmert 28th November 2019
3. The species considered in this assessment are based on the available data from measurements at a similar facility elsewhere
4. Based on the maximum reported pollutant concentration at a similar site elsewhere.
5. No correction has been applied for STP or moisture

Results from sampling at bio-filter outlet Provectus Remediation Ltd Edwin Richards Quarry April 2018 - October 2019

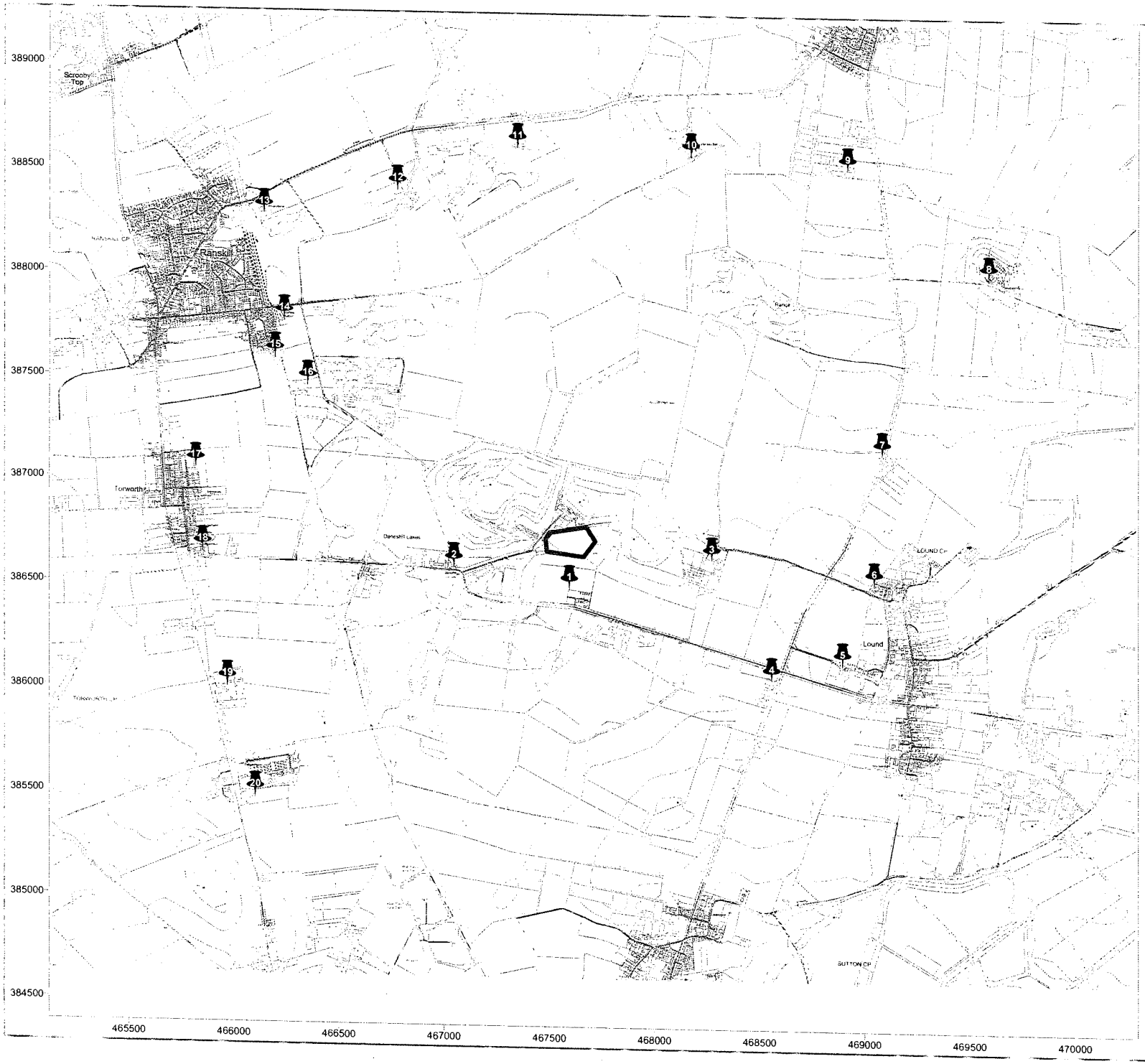
BTEX	09-Apr-18	12-Mar-18	01-May-18	16-May-18	05-Jul-18	27-Jul-18	03-Sep-18	15-Oct-18	14-Nov-18	14-Nov-18	28-Dec-18	31-Jan-19	27-Feb-19	29-Mar-19	29-Apr-19	10-May-19	10-May-19	10-May-19	10-May-19	28-Jun-19	28-Jun-19	30-Jul-19	30-Aug-19	02-Oct-19	Max	average
Benzene	2.3	1.7	1.7	1.7	1.7	7.9	7.5	3.8	2.3	1.7	10	2	2	2	3	2	2	2	5	2	8	2	2	2	10	3
Toluene	5.3	2	1.7	2	1.7	11.1	9.2	4.9	2	1.7	10	10	20	10	20	3	20	20	30	20	40	30	160	53	160	20
Ethlbenzene	1.7	14.8	1.7	1.7	1.7	3.4	1.8	1.8	1.7	1.7	2	2	6	2	5	2	5	3	5	6	10	6	2	2	14.8	4
m/p-Xylene	1.9	10.9	1.7	1.7	1.7	15.1	8.4	6.7	1.7	1.7	3	6	20	7	10	3	10	6	9	20	30	20	4	4	30	8
o-Xylene	1.7	4	1.7	1.7	1.7	6.5	4.3	2.8	1.7	1.7	2	2	5	3	4	2	4	3	4	7	10	10	2	2	10	4

Table 4.1 Model Inventory

Model Inventory

Run	Name		Met Data	Surface roughness at site (m)	terrain	objective
1	Scampton 2014	.apl	Scampton 2014	0.3	off	
2	Scampton 2015	.apl	Scampton 2015	0.3	off	
3	Scampton 2016	.apl	Scampton 2016	0.3	off	
4	Scampton 2017	.apl	Scampton 2017	0.3	off	
5	Scampton 2018	.apl	Scampton 2018	0.3	off	to predict deposition for range of met. conditions
6	rough 0.3m	.apl	Scampton 2016	0.3	off	
7	rough 0.5m	.apl	Scampton 2016	0.5	off	
8	rough 1.0m	.apl	Scampton 2016	1.0	off	to assess significance of surface roughness on dispersion
9	terrain	.apl	Scampton 2016	0.3	on	to assess significance of terrain on dispersion
9	Scenario 1	.apl	Scampton 2016	0.3	off	to provide predictions for worst case dispersion conditions

Figures



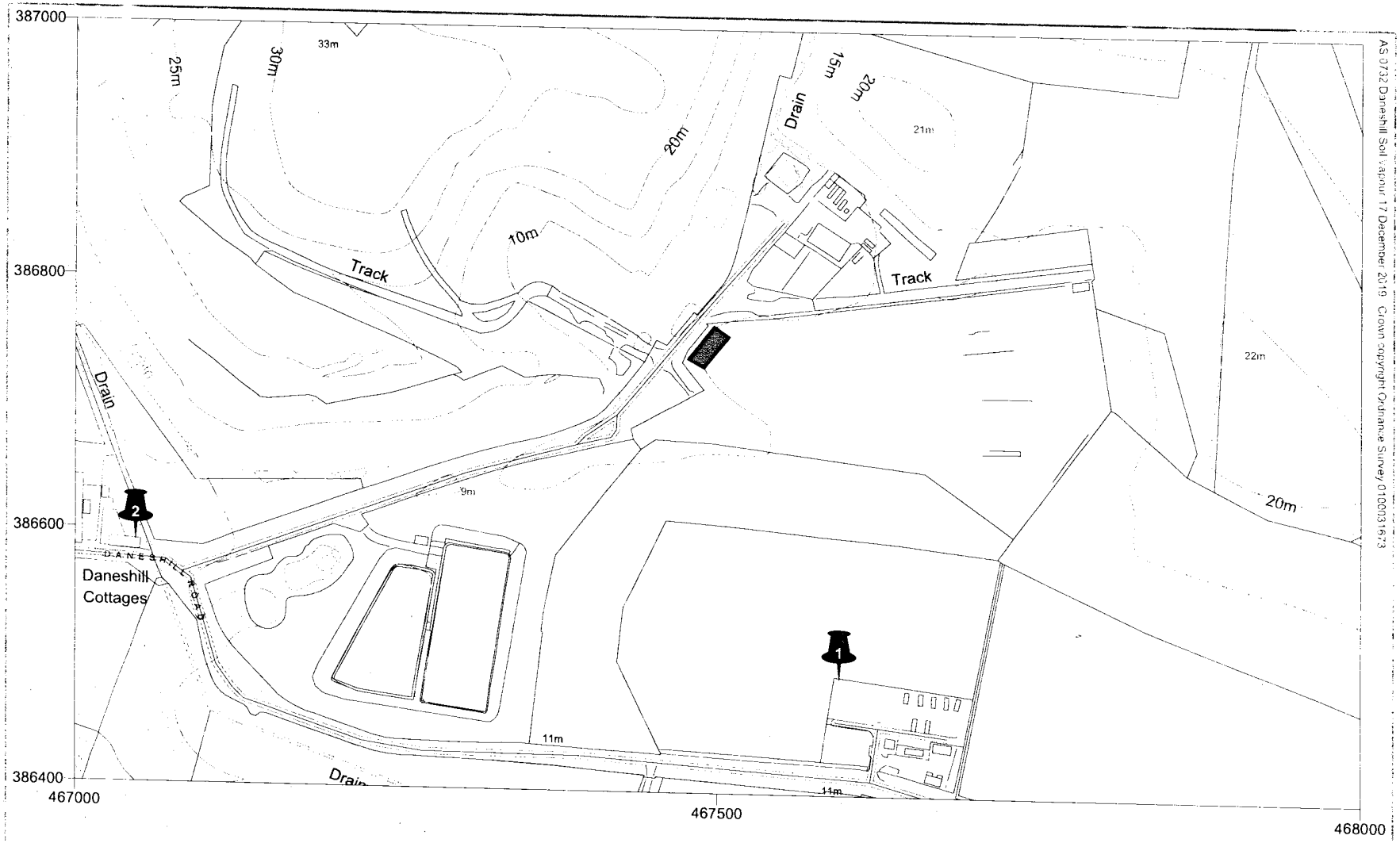
Site Location

indicative site location

sensitive receptor considered in study

Figure 1

Airshed



Model Layout

bio-filter

sensitive receptor considered in study

Figure 2

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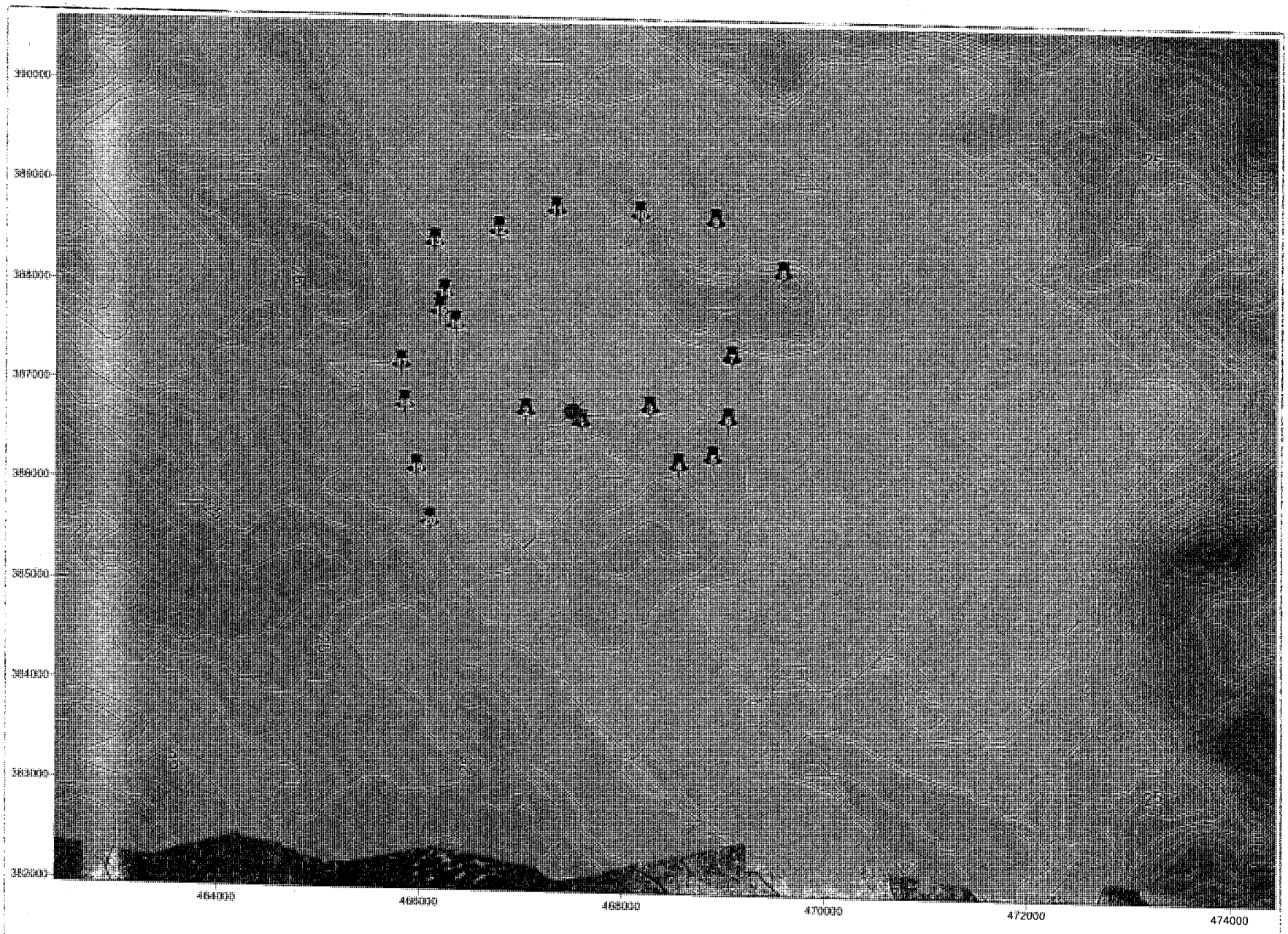
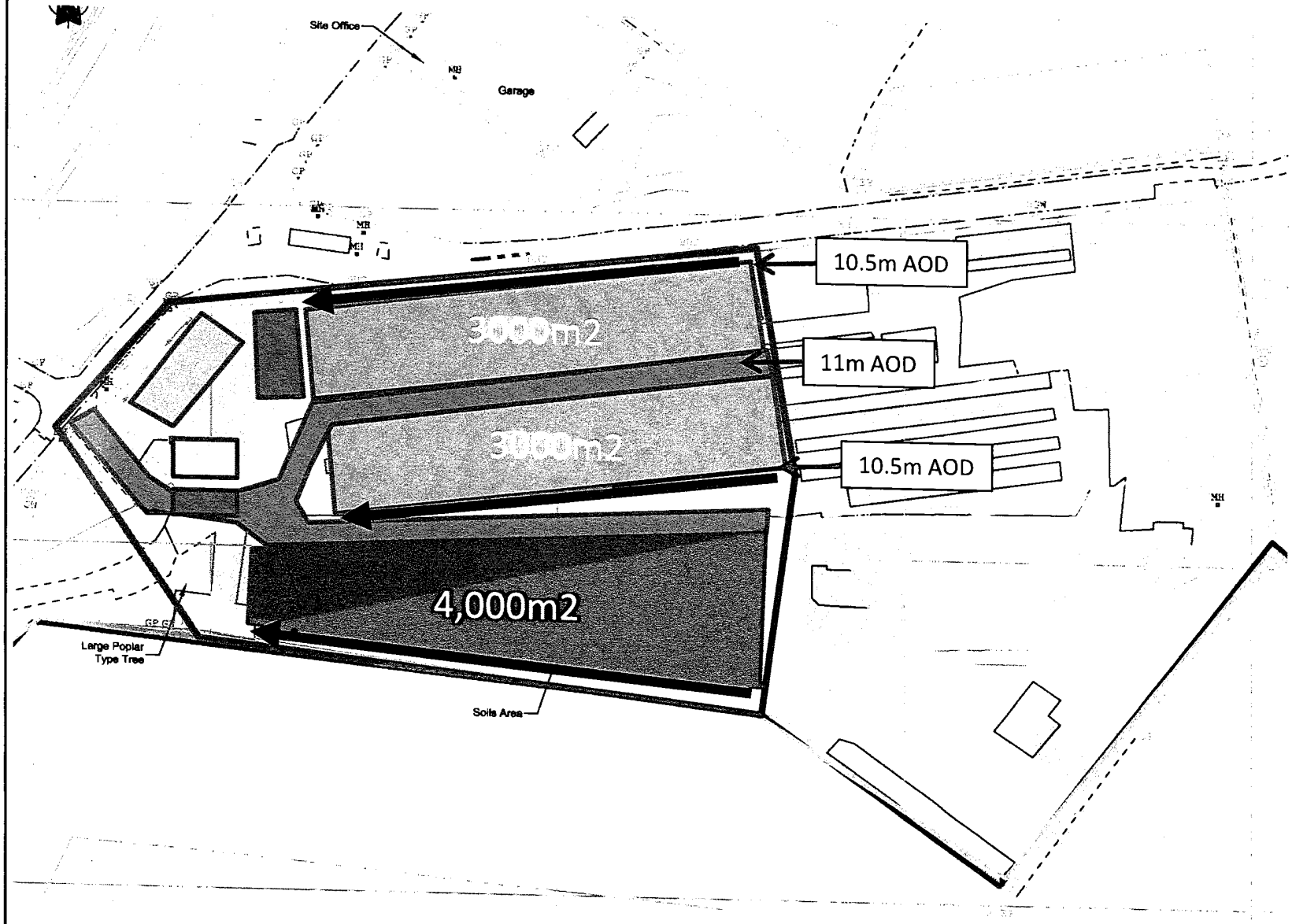


Figure 3

Airshed

Appendix 1 – Project Description



- Biofilter (475m2)
- Biotreatment Area
- Screening/Processing
- Soil and Water Treatment Equipment
- Site Office
- Relocated Weighbridge
- Access Roads
- Fall of Drainage

PROVECTUS
Provectus Remediation Ltd
Wyvols Court
Swallowfield
Reading
RG7 1WY

Tel: 0118 988 0218
www.provectusgroup.com

Client: FCC Environment

Project: Daneshill

Job No.: P268

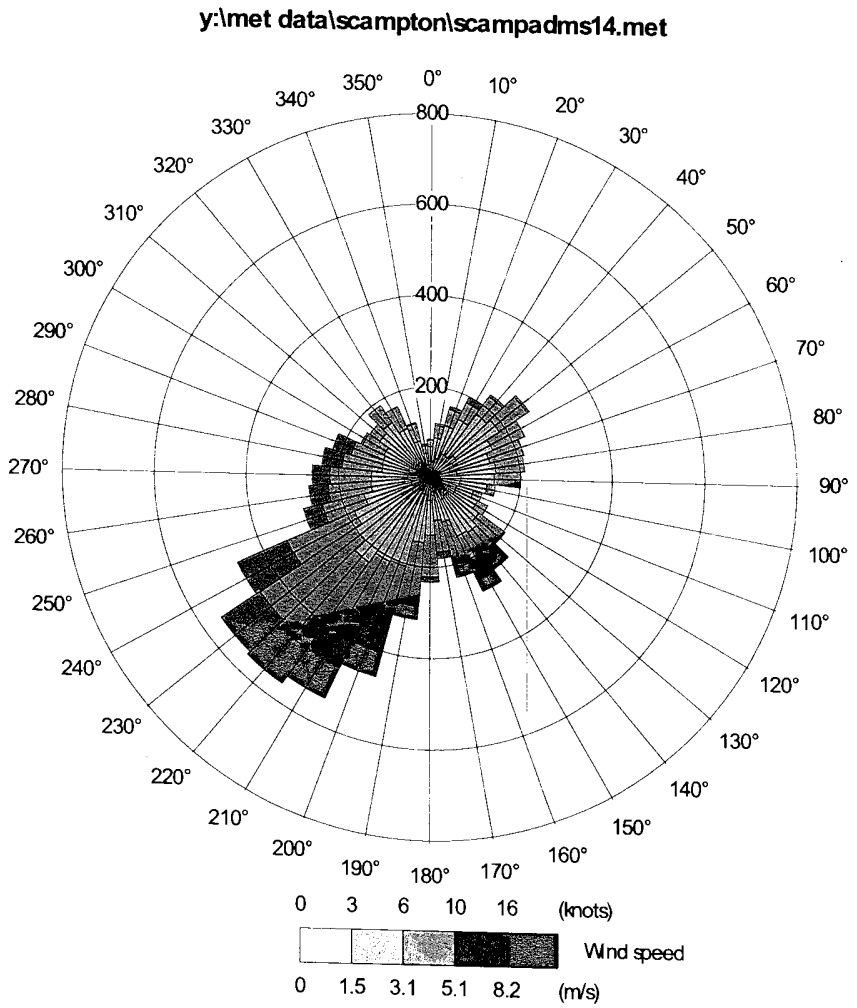
Title: Provisional Layout

Scale: NTS

Date Drawn: September 2019

Drawing No.: Daneshill 1

Appendix 2 – Model Inputs



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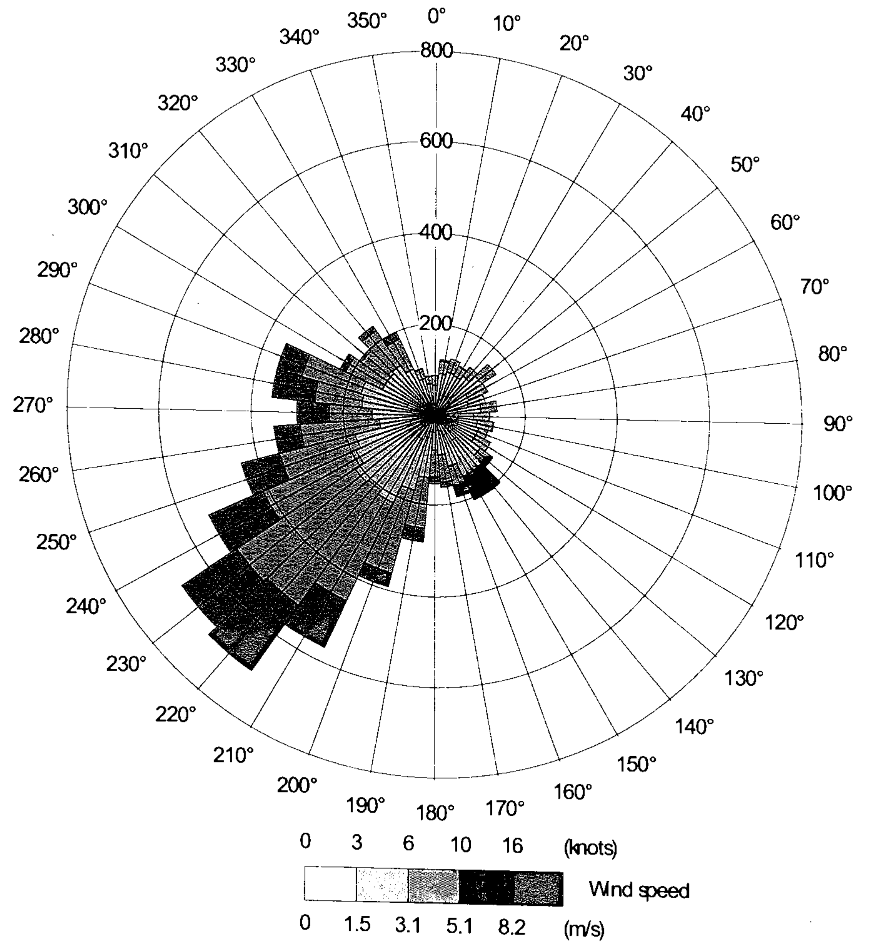

AS 0666 Whitewell AQIA 22 January 2019 : Crown copyright Ordnance Survey 0100031673

Met Data

Appendix 2

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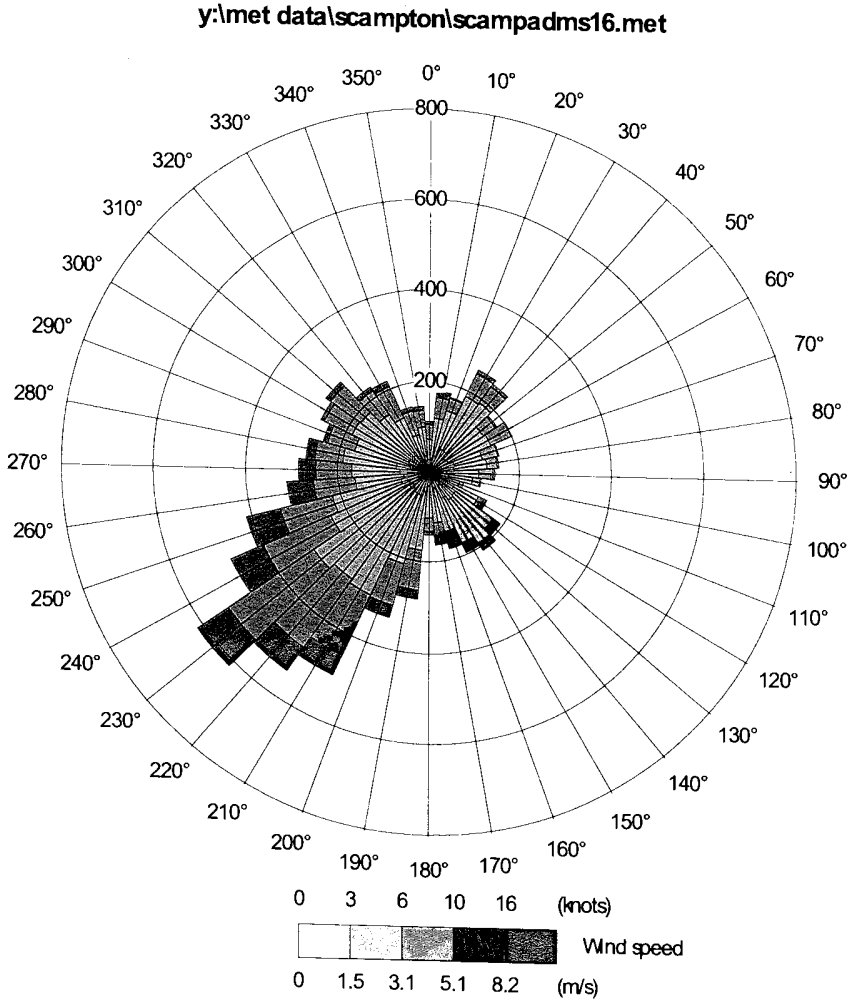

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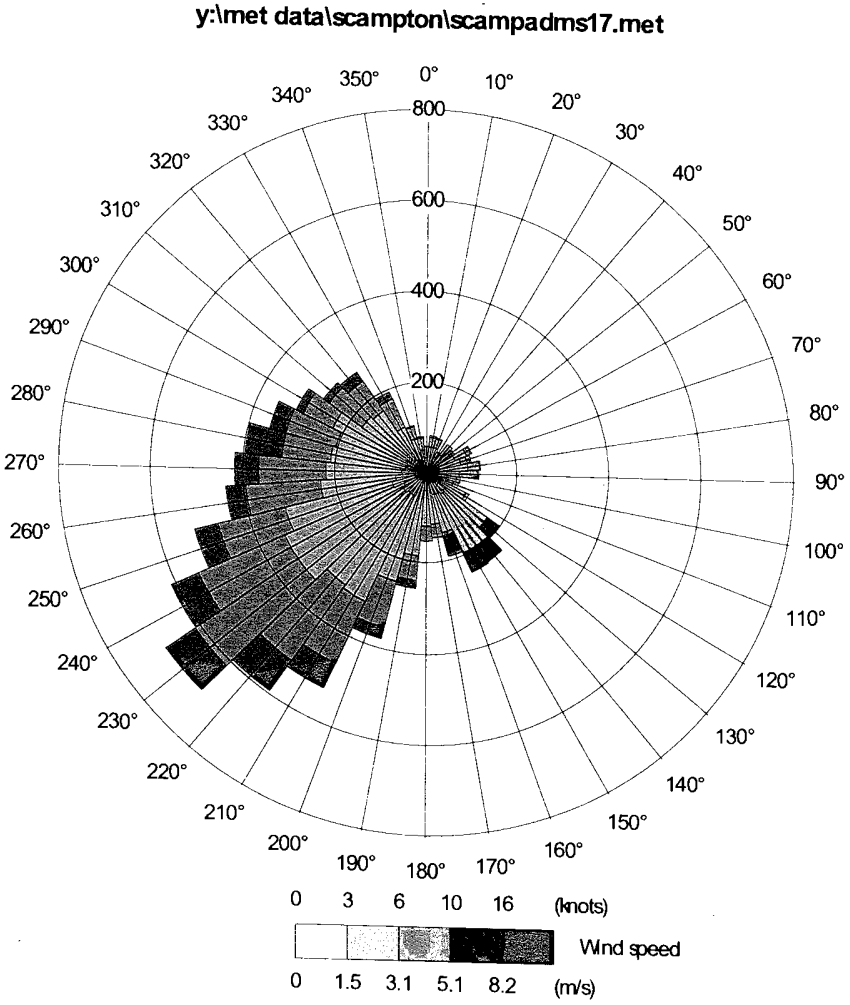

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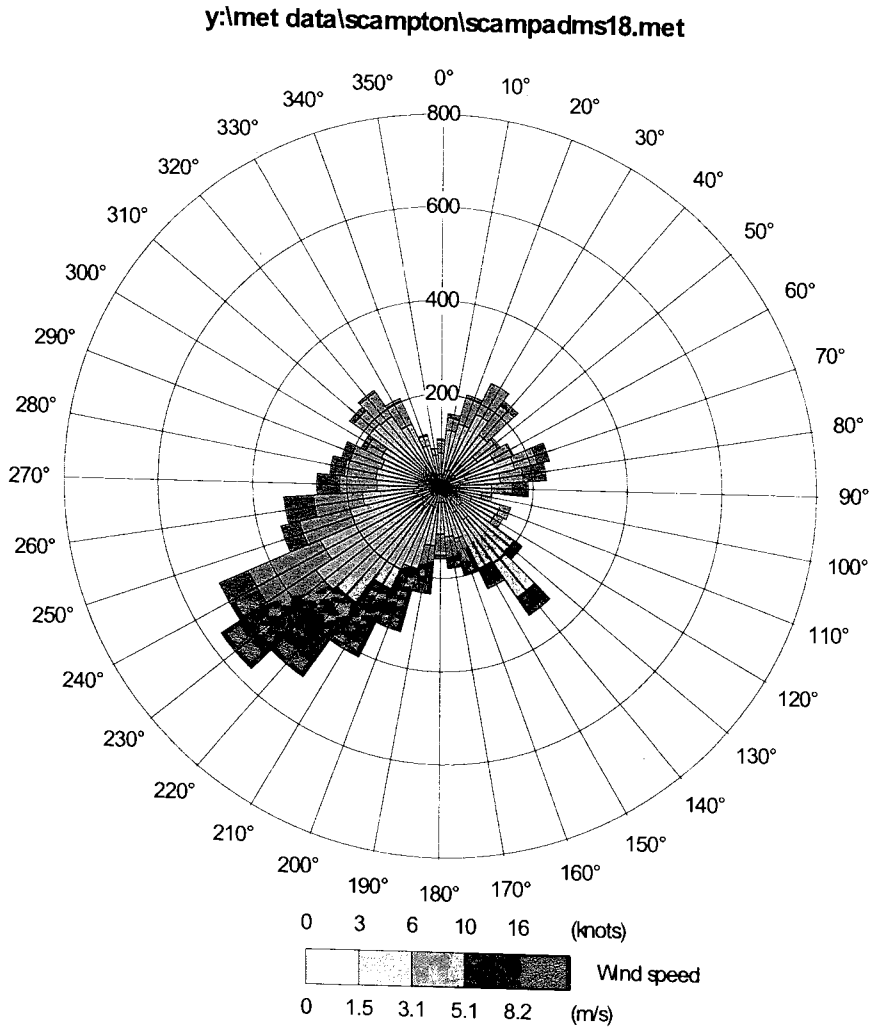
Met Data



Appendix 2

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Visualisation of ADMS input
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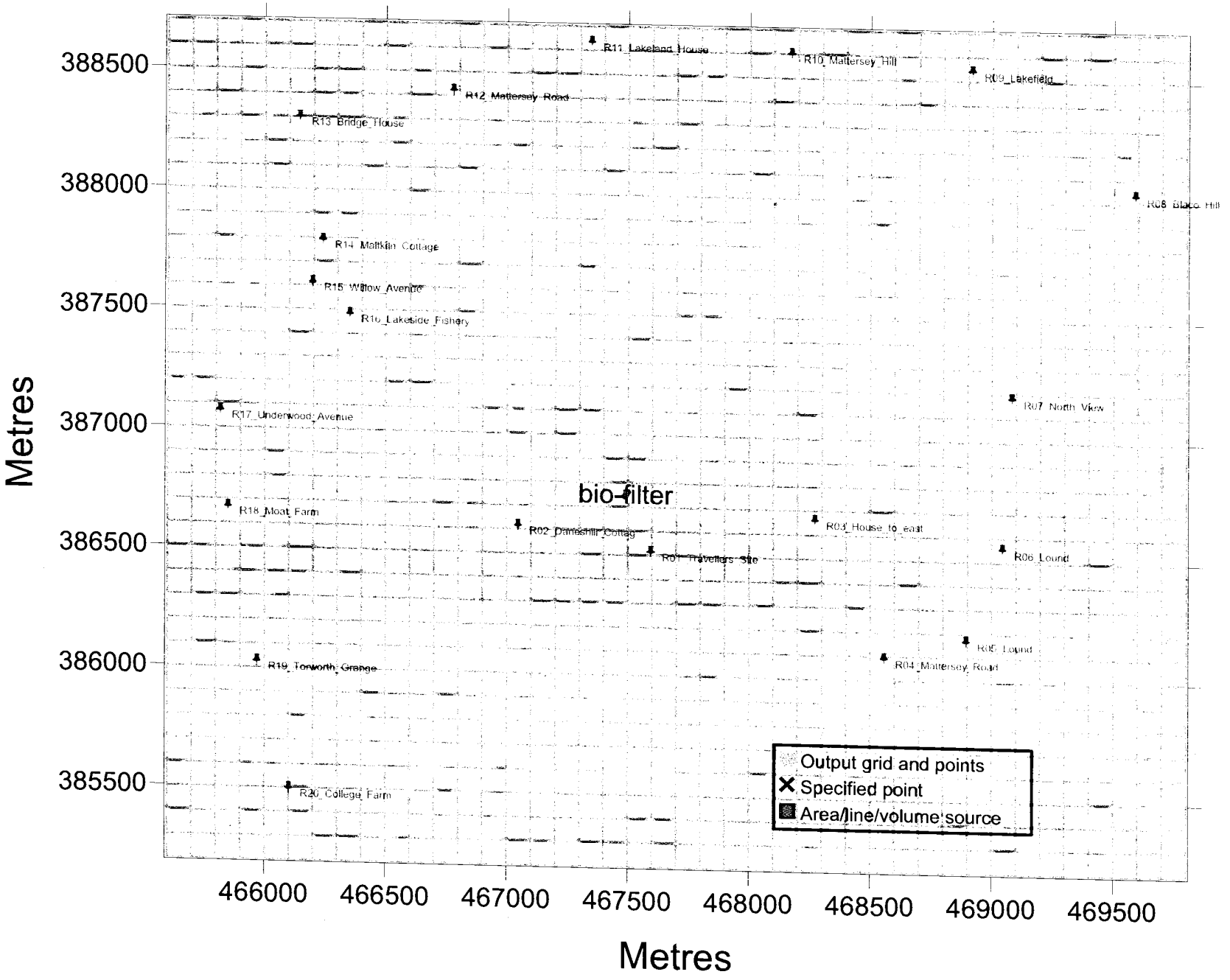

Appendix 3 – Model Outputs

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00018	0.02964	0.00188
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00168
3	House to east	468272	386638	0.00005	0.00556	0.00056
4	Mattersey Road	468558	386067	0.00002	0.00256	0.00023
5	Lound	468895	386146	0.00001	0.00193	0.00016
6	Lound	469046	386531	0.00001	0.00180	0.00017
7	North View	469083	387159	0.00002	0.00172	0.00020
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00013
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00017
11	Lakeland House	467346	388611	0.00001	0.00140	0.00014
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00015
14	Maltkiln Cottage	466239	387768	0.00002	0.00170	0.00023
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00024
16	Lakeside Fishery	466351	387458	0.00002	0.00240	0.00031
17	Underwood Avenue	465818	387047	0.00002	0.00161	0.00024
18	Moat Farm	465851	386645	0.00002	0.00171	0.00024
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00018
20	College Farm	466102	385473	0.00001	0.00136	0.00017
Max				0.00018	0.02964	0.00188

model sensitivity analysis
met data variability
Scampton 2014
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00020	0.03068	0.00202
2	Daneshill Cottage	467047	386590	0.00010	0.01306	0.00090
3	House to east	468272	386638	0.00007	0.00575	0.00078
4	Mattersey Road	468558	386067	0.00002	0.00264	0.00025
5	Lound	468895	386146	0.00002	0.00193	0.00021
6	Lound	469046	386531	0.00002	0.00186	0.00024
7	North View	469083	387159	0.00002	0.00172	0.00020
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00013
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00018
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00013
13	Bridge House	466143	388277	0.00001	0.00121	0.00014
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00021
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00022
16	Lakeside Fishery	466351	387458	0.00002	0.00240	0.00029
17	Underwood Avenue	465818	387047	0.00002	0.00161	0.00015
18	Moat Farm	465851	386645	0.00001	0.00171	0.00012
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00010
20	College Farm	466102	385473	0.00001	0.00136	0.00010
Max				0.00020	0.03068	0.00202

model sensitivity analysis
met data variability
Scampton 2015
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00025	0.03068	0.00240
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00166
3	House to east	468272	386638	0.00007	0.00575	0.00093
4	Mattersey Road	468558	386067	0.00003	0.00264	0.00029
5	Lound	468895	386146	0.00002	0.00193	0.00023
6	Lound	469046	386531	0.00002	0.00186	0.00030
7	North View	469083	387159	0.00002	0.00172	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00086	0.00015
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00022
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00019
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00032
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00035
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00009
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00002	0.00161	0.00017
20	College Farm	466102	385473	0.00001	0.00136	0.00015
Max				0.00025	0.03068	0.00240

model sensitivity analysis
met data variability
Scampton 2016
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00016	0.03068	0.00150
2	Daneshill Cottage	467047	386590	0.00008	0.01198	0.00083
3	House to east	468272	386638	0.00007	0.00575	0.00084
4	Mattersey Road	468558	386067	0.00002	0.00256	0.00024
5	Lound	468895	386146	0.00002	0.00193	0.00021
6	Lound	469046	386531	0.00002	0.00186	0.00026
7	North View	469083	387159	0.00003	0.00172	0.00033
8	Blaco Hill	469589	388011	0.00002	0.00090	0.00018
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00019
11	Lakeland House	467346	388611	0.00001	0.00140	0.00013
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00013
13	Bridge House	466143	388277	0.00001	0.00121	0.00016
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00025
15	Willow Avenue	466196	387589	0.00002	0.00176	0.00024
16	Lakeside Fishery	466351	387458	0.00002	0.00229	0.00029
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00008
18	Moat Farm	465851	386645	0.00001	0.00171	0.00008
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00008
20	College Farm	466102	385473	0.00001	0.00136	0.00004
Max				0.00016	0.03068	0.00150

model sensitivity analysis
met data variability
Scampton 2017
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00021	0.03068	0.00218
2	Daneshill Cottage	467047	386590	0.00013	0.01306	0.00128
3	House to east	468272	386638	0.00006	0.00575	0.00062
4	Mattersey Road	468558	386067	0.00002	0.00264	0.00028
5	Lound	468895	386146	0.00002	0.00190	0.00017
6	Lound	469046	386531	0.00002	0.00186	0.00019
7	North View	469083	387159	0.00002	0.00172	0.00022
8	Blaco Hill	469589	388011	0.00001	0.00090	0.00012
9	Lakefield	468917	388519	0.00001	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00016
11	Lakeland House	467346	388611	0.00001	0.00133	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00012
13	Bridge House	466143	388277	0.00002	0.00121	0.00024
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00036
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00037
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00017
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00001	0.00161	0.00016
20	College Farm	466102	385473	0.00001	0.00136	0.00010
Max				0.00021	0.03068	0.00218

model sensitivity analysis
met data variability
Scampton 2018
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00031	0.05341	0.00269
2	Daneshill Cottage	467047	386590	0.00020	0.02288	0.00217
3	House to east	468272	386638	0.00009	0.00928	0.00111
4	Mattersey Road	468558	386067	0.00003	0.00446	0.00032
5	Lound	468895	386146	0.00002	0.00320	0.00026
6	Lound	469046	386531	0.00003	0.00296	0.00034
7	North View	469083	387159	0.00003	0.00234	0.00035
8	Blaco Hill	469589	388011	0.00001	0.00149	0.00017
9	Lakefield	468917	388519	0.00002	0.00168	0.00018
10	Mattersey Hill	468172	388578	0.00002	0.00208	0.00025
11	Lakeland House	467346	388611	0.00002	0.00233	0.00012
12	Mattersey Road	466777	388399	0.00002	0.00250	0.00018
13	Bridge House	466143	388277	0.00002	0.00202	0.00023
14	Maltkiln Cottage	466239	387768	0.00003	0.00296	0.00038
15	Willow Avenue	466196	387589	0.00003	0.00317	0.00037
16	Lakeside Fishery	466351	387458	0.00004	0.00404	0.00044
17	Underwood Avenue	465818	387047	0.00002	0.00274	0.00012
18	Moat Farm	465851	386645	0.00002	0.00289	0.00017
19	Torworth Grange	465970	386001	0.00002	0.00275	0.00021
20	College Farm	466102	385473	0.00002	0.00222	0.00018
Max				0.00031	0.05341	0.00269

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 0.3m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc | ug/m3 | BENZENE | <All sources> | - | 1hr	P100.00 | ug/m3 | BENZENE | <All sources> | - | 1hr	P 98.00 | ug/m3 | BENZENE | <All sources> | - | 1hr
1	Travellers Site	467595	386491	0.00025	0.03068	0.00240
2	Daneshill Cottage	467047	386590	0.00014	0.01306	0.00166
3	House to east	468272	386638	0.00007	0.00575	0.00093
4	Mattersey Road	468558	386067	0.00003	0.00264	0.00029
5	Lound	468895	386146	0.00002	0.00193	0.00023
6	Lound	469046	386531	0.00002	0.00186	0.00030
7	North View	469083	387159	0.00002	0.00172	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00086	0.00015
9	Lakefield	468917	388519	0.00002	0.00101	0.00016
10	Mattersey Hill	468172	388578	0.00002	0.00128	0.00022
11	Lakeland House	467346	388611	0.00001	0.00140	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00148	0.00014
13	Bridge House	466143	388277	0.00001	0.00121	0.00019
14	Maltkiln Cottage	466239	387768	0.00002	0.00177	0.00032
15	Willow Avenue	466196	387589	0.00002	0.00190	0.00030
16	Lakeside Fishery	466351	387458	0.00003	0.00240	0.00035
17	Underwood Avenue	465818	387047	0.00001	0.00161	0.00009
18	Moat Farm	465851	386645	0.00001	0.00171	0.00014
19	Torworth Grange	465970	386001	0.00002	0.00161	0.00017
20	College Farm	466102	385473	0.00001	0.00136	0.00015
Max				0.00025	0.03068	0.00240

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 0.5m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00022	0.01970	0.00226
2	Daneshill Cottage	467047	386590	0.00012	0.00852	0.00158
3	House to east	468272	386638	0.00006	0.00371	0.00087
4	Mattersey Road	468558	386067	0.00002	0.00171	0.00026
5	Lound	468895	386146	0.00002	0.00126	0.00022
6	Lound	469046	386531	0.00002	0.00121	0.00027
7	North View	469083	387159	0.00002	0.00112	0.00028
8	Blaco Hill	469589	388011	0.00001	0.00054	0.00014
9	Lakefield	468917	388519	0.00001	0.00066	0.00015
10	Mattersey Hill	468172	388578	0.00002	0.00085	0.00022
11	Lakeland House	467346	388611	0.00001	0.00091	0.00010
12	Mattersey Road	466777	388399	0.00001	0.00097	0.00013
13	Bridge House	466143	388277	0.00001	0.00078	0.00017
14	Maltkiln Cottage	466239	387768	0.00002	0.00115	0.00028
15	Willow Avenue	466196	387589	0.00002	0.00124	0.00028
16	Lakeside Fishery	466351	387458	0.00002	0.00155	0.00034
17	Underwood Avenue	465818	387047	0.00001	0.00106	0.00010
18	Moat Farm	465851	386645	0.00001	0.00112	0.00014
19	Torworth Grange	465970	386001	0.00001	0.00107	0.00018
20	College Farm	466102	385473	0.00001	0.00089	0.00014
Max				0.00022	0.01970	0.00226

model sensitivity analysis
surface roughness
Scampton 2016
surface roughness 1.0m
terrain effects off

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-| 1hr	P100.00|ug/m3|BENZENE|<All sources>|-| 1hr	P 98.00|ug/m3|BENZENE|<All sources>|-| 1hr
1	Travellers Site	467595	386491	0.00023	0.01934	0.00258
2	Daneshill Cottage	467047	386590	0.00012	0.00944	0.00188
3	House to east	468272	386638	0.00007	0.00399	0.00103
4	Mattersey Road	468558	386067	0.00002	0.00171	0.00027
5	Lound	468895	386146	0.00002	0.00125	0.00022
6	Lound	469046	386531	0.00002	0.00122	0.00035
7	North View	469083	387159	0.00002	0.00115	0.00030
8	Blaco Hill	469589	388011	0.00001	0.00056	0.00010
9	Lakefield	468917	388519	0.00001	0.00060	0.00017
10	Mattersey Hill	468172	388578	0.00002	0.00083	0.00023
11	Lakeland House	467346	388611	0.00001	0.00090	0.00012
12	Mattersey Road	466777	388399	0.00001	0.00092	0.00016
13	Bridge House	466143	388277	0.00001	0.00077	0.00022
14	Maltkiln Cottage	466239	387768	0.00002	0.00122	0.00036
15	Willow Avenue	466196	387589	0.00002	0.00127	0.00034
16	Lakeside Fishery	466351	387458	0.00002	0.00163	0.00041
17	Underwood Avenue	465818	387047	0.00001	0.00108	0.00009
18	Moat Farm	465851	386645	0.00001	0.00115	0.00021
19	Torworth Grange	465970	386001	0.00001	0.00106	0.00014
20	College Farm	466102	385473	0.00001	0.00091	0.00014
Max				0.00023	0.01934	0.00258

model sensitivity analysis
terrain effects
Scampton 2016
surface roughness 0.3m
terrain effects on

No	Receptor name	X(m)	Y(m)	LTConc|ug/m3|BENZENE|<All sources>|-|1hr	P100.00|ug/m3|BENZENE|<All sources>|-|1hr	P 98.00|ug/m3|BENZENE|<All sources>|-|1hr
1	Travellers Site	467595	386491	0.00031	0.05341	0.00269
2	Daneshill Cottage	467047	386590	0.00020	0.02288	0.00217
3	House to east	468272	386638	0.00009	0.00928	0.00111
4	Mattersey Road	468558	386067	0.00003	0.00446	0.00032
5	Lound	468895	386146	0.00002	0.00320	0.00026
6	Lound	469046	386531	0.00003	0.00296	0.00034
7	North View	469083	387159	0.00003	0.00234	0.00035
8	Blaco Hill	469589	388011	0.00001	0.00149	0.00017
9	Lakefield	468917	388519	0.00002	0.00168	0.00018
10	Mattersey Hill	468172	388578	0.00002	0.00208	0.00025
11	Lakeland House	467346	388611	0.00002	0.00233	0.00012
12	Mattersey Road	466777	388399	0.00002	0.00250	0.00018
13	Bridge House	466143	388277	0.00002	0.00202	0.00023
14	Maltkiln Cottage	466239	387768	0.00003	0.00296	0.00038
15	Willow Avenue	466196	387589	0.00003	0.00317	0.00037
16	Lakeside Fishery	466351	387458	0.00004	0.00404	0.00044
17	Underwood Avenue	465818	387047	0.00002	0.00274	0.00012
18	Moat Farm	465851	386645	0.00002	0.00289	0.00017
19	Torworth Grange	465970	386001	0.00002	0.00275	0.00021
20	College Farm	466102	385473	0.00002	0.00222	0.00018
Max				0.00031	0.05341	0.00269

Scenario 1
worst-case dispersopm conditons
Scampton 2016
surface roughness 0.3m
terrain effects off

No	Receptor name	X(m)	Y(m)	Benzene	Toluene	Ethylbenzene	Xylene
1	Travellers Site	467595	386491	0.00031	0.00495	0.00046	0.00124
2	Daneshill Cottage	467047	386590	0.00020	0.00322	0.00030	0.00080
3	House to east	468272	386638	0.00009	0.00146	0.00013	0.00036
4	Mattersey Road	468558	386067	0.00003	0.00051	0.00005	0.00013
5	Lound	468895	386146	0.00002	0.00037	0.00003	0.00009
6	Lound	469046	386531	0.00003	0.00045	0.00004	0.00011
7	North View	469083	387159	0.00003	0.00044	0.00004	0.00011
8	Blaco Hill	469589	388011	0.00001	0.00024	0.00002	0.00006
9	Lakefield	468917	388519	0.00002	0.00031	0.00003	0.00008
10	Mattersey Hill	468172	388578	0.00002	0.00040	0.00004	0.00010
11	Lakeland House	467346	388611	0.00002	0.00025	0.00002	0.00006
12	Mattersey Road	466777	388399	0.00002	0.00027	0.00003	0.00007
13	Bridge House	466143	388277	0.00002	0.00030	0.00003	0.00008
14	Maltkiln Cottage	466239	387768	0.00003	0.00048	0.00004	0.00012
15	Willow Avenue	466196	387589	0.00003	0.00050	0.00005	0.00013
16	Lakeside Fishery	466351	387458	0.00004	0.00062	0.00006	0.00016
17	Underwood Avenue	465818	387047	0.00002	0.00027	0.00003	0.00007
18	Moat Farm	465851	386645	0.00002	0.00031	0.00003	0.00008
19	Torworth Grange	465970	386001	0.00002	0.00035	0.00003	0.00009
20	College Farm	466102	385473	0.00002	0.00028	0.00003	0.00007
Max				0.00031	0.00495	0.00046	0.00124

Scenario 1
units = ug/m3

No	Receptor name	X(m)	Y(m)	Benzene	Toluene	Ethylbenzene	Xylene
1	Travellers Site	467595	386491	0.05341	0.85453	0.07904	0.21363
2	Daneshill Cottage	467047	386590	0.02288	0.36608	0.03386	0.09152
3	House to east	468272	386638	0.00928	0.14847	0.01373	0.03712
4	Mattersey Road	468558	386067	0.00446	0.07136	0.00660	0.01784
5	Lound	468895	386146	0.00320	0.05117	0.00473	0.01279
6	Lound	469046	386531	0.00296	0.04734	0.00438	0.01183
7	North View	469083	387159	0.00234	0.03742	0.00346	0.00936
8	Blaco Hill	469589	388011	0.00149	0.02377	0.00220	0.00594
9	Lakefield	468917	388519	0.00168	0.02692	0.00249	0.00673
10	Mattersey Hill	468172	388578	0.00208	0.03332	0.00308	0.00833
11	Lakeland House	467346	388611	0.00233	0.03735	0.00345	0.00934
12	Mattersey Road	466777	388399	0.00250	0.03996	0.00370	0.00999
13	Bridge House	466143	388277	0.00202	0.03234	0.00299	0.00809
14	Maltkiln Cottage	466239	387768	0.00296	0.04741	0.00439	0.01185
15	Willow Avenue	466196	387589	0.00317	0.05066	0.00469	0.01266
16	Lakeside Fishery	466351	387458	0.00404	0.06470	0.00598	0.01617
17	Underwood Avenue	465818	387047	0.00274	0.04385	0.00406	0.01096
18	Moat Farm	465851	386645	0.00289	0.04624	0.00428	0.01156
19	Torworth Grange	465970	386001	0.00275	0.04407	0.00408	0.01102
20	College Farm	466102	385473	0.00222	0.03547	0.00328	0.00887
Max				0.05341	0.85453	0.07904	0.21363

Scenario 1
units = ug/m3

APPENDIX 5

SOCOTEC

TEST REPORT ASC/39489

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31526

Date Samples Received: 12 June 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 13 June 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
4	ATD Tube - Tenax	ASC/SOP/211*	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

*Sample ASC/39489.001, 164501, is classed as deviating due to the internal standard not meeting our criteria. These results therefore have a higher level of uncertainty.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
164501* BF1 MAY 19	ASC/39489.001*	08:57 10/05/19	10:05 10/05/19	Mi159027	<5	<10	<5	<10	<5	200
164503 BF2 MAY 19	ASC/39489.002	09:14 24/05/19	10:14 24/05/19	H0207919	<5	70	20	30	10	1700
164505 BF3 MAY 19	ASC/39489.003	12:38 31/05/19	13:01 31/05/19	Mi114677	<5	60	10	20	10	1100
164507 BF Manifold May 2019	ASC/39489.004	10:40 31/05/19	11:42 31/05/19	Mi002623	20	110	20	30	20	7100

1. *Sample ASC/39489.001, 164501, is classed as deviating due to the internal standard not meeting our criteria. These results therefore have a higher level of uncertainty.

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SOCOTEC

Results

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
164501 BF1 MAY 19	ASC/39489.001	08:57 10/05/19	10:05 10/05/19	Mi159027	3.4	<2	<3	<2	<3	<2	60
164503 BF2 MAY 19	ASC/39489.002	09:14 24/05/19	10:14 24/05/19	H0207919	3.0	<2	20	5	10	4	510
164505 BF3 MAY 19	ASC/39489.003	12:38 31/05/19	14:01 31/05/19	Mi114677	3.7	<2	20	3	6	3	340
164507 BF Manifold MAY 2019	ASC/39489.004	10:40 31/05/19	11:42 31/05/19	Mi002623	3.2	5	30	5	9	4	2200

END OF TEST REPORT

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TEST REPORT ASC/39919

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	31704
Date Samples Received:	10 July 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	18 July 2019

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
2	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
165688 BF JUN 19	ASC/39919.001	11:05 28/06/19	12:05 28/06/19	Mi064791	<5	70	20	60	30	2200
165690 BF Manifold JUN 19	ASC/39919.002	10:00 28/06/19	11:00 28/06/19	Mi107378	30	140	40	100	40	23000

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
165688 BF JUN 19	ASC/39919.001	11:05 28/06/19	12:05 28/06/19	Mi064791	3.7	<2	20	6	20	7	970
165690 BF Manifold JUN 19	ASC/39919.002	10:00 28/06/19	11:00 28/06/19	Mi107378	2.3	8	40	10	30	10	10000

END OF TEST REPORT

UKAS TESTING
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SOCOTEC

TEST REPORT ASC/40426

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31887

Date Samples Received: 06 August 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 16 August 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

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Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF JUL 19 166815	ASC/40426.001	11:45 30/07/19	12:45 30/07/19	Mi144436	<5	90	20	60	30	1100

Table 2: Concentration of BTEX Components and TPHs ($\mu g/m^3$)

					Units	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF JUL 19 166815	ASC/40426.001	11:45 30/07/19	12:45 30/07/19	Mi144436	3.0	<2	30	6	20	10	350

END OF TEST REPORT

UKAS TESTING
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SOCOTEC

TEST REPORT ASC/40948

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	32164
Date Samples Received:	11 September 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	02 October 2019

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	**ATD Tube - Tenax**	ASC/SOP/211*	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

*The internal standard level for sample ASC/40948.001 falls outside of our criteria; therefore the results are not UKAS Accredited.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF AUG 19 168575	ASC/40948.001	10:00 30/08/19	11:03 30/08/19	Mi002533	6*	510*	6*	10*	<5*	1100*

*The internal standard level for sample ASC/40948.001 falls outside of our criteria; therefore the results are not UKAS Accredited.

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF AUG 19 168575	ASC/40948.001	10:00 30/08/19	11:03 30/08/19	Mi002533	3.2	2	160	2	4	<2	360

END OF TEST REPORT

SOCOTEC

TEST REPORT ASC/41464

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 32436

Date Samples Received: 11 October 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 22 October 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF SEP 2019 170105	ASC/41464.001	10:55 02/10/19	11:58 02/10/19	Mi131798	<5	180	5	10	6	1400

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Start**	**End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
BF SEP 2019 170105	ASC/41464.001	10:55 02/10/19	11:58 02/10/19	Mi131798	3.3	<2	53	2	4	2	420

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/37520

Customer:	Mr C Gould STC Operator Provectus Remediation Limited Edwin Richards Quarry Portway Road Rowley Regis B65 9DN
Testing Facility:	Specialist Chemistry SOCOTEC Etwall Building Bretby Business Park Ashby Road Burton Upon Trent DE15 0YZ
Purchase Order Number:	30639
Date Samples Received:	08 February 2019
Condition of Samples:	Ambient and Satisfactory
Approved by:	
Approver's name:	Nicola Baker
Job Title:	Analyst
Test Report Date:	18 February 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
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SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158915 BF JAN 19	ASC/37520.001	08:23 31/01/19	09:27 31/01/19	Mi114876	<5	40	6	20	6	700

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158915 BF JAN 19	ASC/37520.001	08:23 31/01/19	09:27 31/01/19	Mi114876	2.9	<2	10	<2	6	2	300

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/37932

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 30832

Date Samples Received: 06 March 2019

Condition of Samples: Ambient and Satisfactory

Approved by:

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 11 March 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	**ATD Tube - Tenax**	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
160147 BF FEB 19	ASC/37932.001	08:00 27/02/19	09:03 27/02/19	A25914	<5	60	20	60	20	1000

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
160147 BF FEB 19	ASC/37932.001	08:00 27/02/19	09:03 27/02/19	A25914	3.3	<2	20	6	20	5	300

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/38478

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31096

Date Samples Received: 09 April 2019

Condition of Samples: Ambient and Satisfactory

Approved by:

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 17 April 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
161646 BF MAR 19	ASC/38478.001	08:55 29/03/19	10:01 29/03/19	A16674	7	30	7	20	9	2100

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
161646 BF MAR 19	ASC/38478.001	08:55 29/03/19	10:01 29/03/19	A16674	3.3	2	10	2	7	3	640

END OF TEST REPORT

UKAS TESTING
1252

SOCOTEC

TEST REPORT ASC/39029

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 31320

Date Samples Received: 14 May 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 21 May 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

UKAS TESTING
1252

SOCOTEC

Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPHs (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
163215 BF APR 19	ASC/39029.001	09:32 29/04/19	10:35 29/04/19	Mi107378	8	50	20	40	10	2000

Table 2: Concentration of BTEX Components and TPHs (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
163215 BF APR 19	ASC/39029.001	09:32 29/04/19	10:35 29/04/19	Mi107378	3.2	3	20	5	10	4	620

END OF TEST REPORT

UKAS TESTING
1252

gradko

2187

Report Number	**M01545R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0237**
Despatch Note Number	**39939**
Date Samples Received	**21/02/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA10771**		
Gradko Lab Reference	**04M0181**		
Volume (Litres)	**3**		
Sample ID	**BF JAN 18**		
BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5	<1.7
Toluene	U	<5	<1.7
Ethylbenzene	U	<5	<1.7
m/p-Xylene	U	<5	<1.7
o-Xylene	U	<5	<1.7
		Estimated ng on tube	**µgm^{-3}***
Total TPH		21	6.9

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LABORATORY ANALYSIS REPORT

Tube Number	**000569**	
Gradko Lab Reference	**180227_TXTABLANK_27R**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limits for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**27/02/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**08/03/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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Report Number	**M05300R**
Customer	**Provectus Remediation Ltd** **Edwin Richard Quarry** **Rowley Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0843**
Despatch Note Number	**43011**
Date Samples Received	**27/07/2018**
Diffusion Tube Type	**Tenax**
Job Reference	**Quote-34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001639**
Gradko Lab Reference	**02M0831**
Sample Volume (L)	**3**
Sample ID	**BF July 18**

BTEX	**Accreditation Status**	ng on tube	μgm^{-3}
Benzene	U	23.7	7.9
Toluene	U	33.3	11.1
Ethylbenzene	U	10.1	3.4
m/p-Xylene	U	45.4	15.1
o-Xylene	U	19.5	6.5

	Estimated ng on tube	μgm^{-3}
Total TPHs	714	238

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA 03916**
Gradko Lab Reference	**23_BLANKTXTA180809_27**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5.0
Toluene	U	<5.0
Ethylbenzene	U	<5.0
m/p-Xylene	U	<5.0
o-Xylene	U	<5.0

	Estimated ng on tube
Total TPHs	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.5% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5.0ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**M.Angelova**	**Date of Analysis**	**08/08/2018**
Report Checked By	**G.Aikman**	**Date of Report**	**10/08/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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LABORATORY ANALYSIS REPORT

Report Number	**M06151R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0980**
Despatch Note Number	**43012**
Date Samples Received	**03/09/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA08815**		
Gradko Lab Reference	**04M1074**		
Volume (Litres)	**3**		
Sample ID	**BF AUG 18**		
	Accreditation		
BTEX	**Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	22.4	7.5
Toluene	U	27.5	9.2
Ethylbenzene	U	5.5	1.8
m/p-Xylene	U	25.2	8.4
o-Xylene	U	13.0	4.3

	Estimated ng on tube	**µgm^{-3}***
Total TPH	1933	644

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA10597**	
Gradko Lab Reference	**180907_TXTABLANK_26**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**07/09/2018**
Report Checked By	**Len Gates**	**Date of Report**	**11/09/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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LABORATORY ANALYSIS REPORT

Report Number	**M07243R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V1171**
Despatch Note Number	**43013**
Date Samples Received	**15/10/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**Quote - 34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001639**		
Gradko Lab Reference	**04M1176**		
Volume (Litres)	**3**		
Sample ID	**BF SEP 18**		
BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	11.5	3.8
Toluene	U	14.8	4.9
Ethylbenzene	U	5.3	1.8
m/p-Xylene	U	20.1	6.7
o-Xylene	U	8.4	2.8
		Estimated ng on tube	**µgm^{-3}***
Total TPH		397	132

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LABORATORY ANALYSIS REPORT

Tube Number		
Gradko Lab Reference		
Sample ID	**Laboratory Blank Accreditation Status**	
BTEX		ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**22/10/2018**
Report Checked By	**Len Gates**	**Date of Report**	**24/10/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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Report Number	**M07993R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowley Regis** **Birmingham, B65 9DS**
Booking In Reference	**V1298**
Despatch Note Number	**43015**
Date Samples Received	**14/11/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA11937**		
Gradko Lab Reference	**04M1245**		
Volume (Litres)	**3**		
Sample ID	**BF NOV/2**		
	Accreditation		
BTEX	**Status**	ng on tube	µgm^{-3}*
Benzene	U	6.8	2.3
Toluene	U	5.9	2.0
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	5.2	1.7
o-Xylene	U	<5.0	<1.7
		Estimated ng on tube	µgm^{-3}*
Total TPH		67	22

Tube Number	**GRA10561**	
Gradko Lab Reference	**181120_TXTABLANK_1**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

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	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	Katya Paldamova	Date of Analysis	21/11/2018
Report Checked By	Mariella Angelova	Date of Report	22/11/2018

Analysis has been carried out in accordance with in-house method GLM 13

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Report Number	**M07994R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowley Regis** **Birmingham, B65 9DS**
Booking In Reference	**V1296**
Despatch Note Number	**43014**
Date Samples Received	**14/11/2018**
Diffusion Tube Type	**TXTA**
Job Number	**Quote 34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA10609**		
Gradko Lab Reference	**04M1246**		
Volume (Litres)	**3**		
Sample ID	**BF OCT 18**		
BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7
		Estimated ng on tube	**µgm^{-3}***
Total TPH		29	9.6

Tube Number	**GRA10561**	
Gradko Lab Reference	**181120_TXTABLANK_1**	
Sample ID	**Laboratory Blank**	
BTEX	**Accreditation Status**	**ng on tube**
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

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LABORATORY ANALYSIS REPORT

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU ±17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	Katya Paldamova	Date of Analysis	21/11/2018
Report Checked By	Mariella Angelova	Date of Report	22/11/2018

Analysis has been carried out in accordance with in-house method GLM 13

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SOCOTEC

TEST REPORT ASC/37207

Customer: Mr C Gould
STC Operator
Provectus Remediation Limited
Edwin Richards Quarry
Portway Road
Rowley Regis
B65 9DN

Testing Facility: Specialist Chemistry
SOCOTEC
Etwall Building
Bretby Business Park
Ashby Road
Burton Upon Trent
DE15 0YZ

Purchase Order Number: 30523

Date Samples Received: 22 January 2019

Condition of Samples: Ambient and Satisfactory

Approved by: 

Approver's name: Nicola Baker

Job Title: Analyst

Test Report Date: 30 January 2019

Opinions and Interpretations expressed herein are outside the scope of UKAS accreditation

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Sample and Method Descriptions

Number of Samples Received	Matrix / Sample Description	Method ID	Description
1	ATD Tube - Tenax	ASC/SOP/211	**ANALYSIS OF BTEX IN AMBIENT AIR BY THERMAL DESORPTION GAS CHROMATOGRAPHY / MASS SPECTROMETRY** – Samples were analysed for benzene, toluene, ethyl benzene and xylenes by ATD-GC-MS.
		IHM	**TPH -** The tubes were analysed by ATD-GC/MS operating in scan mode. The TPH were tentatively identified by mass spectral data and semi-quantified against the response of a calibration of Toluene.

SOCOTEC

Results

Table 1: Amount of BTEX Components and TPH (ng)

				Units	ng	ng	ng	ng	ng	ng
				Method ID (ASC/SOP/xxx)	211	211	211	211	211	IHM
				Method Limit of Detection	5	10	5	10	5	100
				UKAS	YES	YES	YES	YES	YES	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158193 BF DEC 18	ASC/37207.001	10:00 28/12/18	11:00 28/12/18	GRA 06998	40	30	<5	10	<5	800

Table 2: Concentration of BTEX Components and TPH (µg/m^3)

					Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
					UKAS	NO	NO	NO	NO	NO	NO
Customer Sample Reference	**Laboratory Sample Reference**	**Sampling Start**	**Sampling End**	**Tube ID**	**Sampling Volume (L)**	Benzene	Toluene	Ethyl-Benzene	m,p-Xylene	o-Xylene	Total Petroleum Hydrocarbons
158193 BF DEC 18	ASC/37207.001	10:00 28/12/18	11:00 28/12/18	GRA 06998	3	10	10	<2	4	<2	300

END OF TEST REPORT

UKAS TESTING
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LABORATORY ANALYSIS REPORT

Report Number	**M01964R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0317**
Despatch Note Number	**42506**
Date Samples Received	**12/03/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA08329**		
Gradko Lab Reference	**04M0316**		
Volume (Litres)	**3**		
Sample ID	**BF FEB 18**		
BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5.0	<1.7
Toluene	U	6.0	2.0
Ethylbenzene	U	44.5	14.8
m/p-Xylene	U	32.7	10.9
o-Xylene	U	12.1	4.0
		Estimated ng on tube	**µgm^{-3}***
Total TPH		187	62.4

Report Number M01964R Page 1 of 2

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA06174**
Gradko Lab Reference	**BLANKTXTA180327_22**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5

	Estimated ng on tube
Total TPH	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limits for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**26/03/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**05/04/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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Report Number	**M02682R**
Customer	**Provectus Remediation Ltd** **Edwin Richard Quarry** **Rowley Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0423**
Despatch Note Number	**43007**
Date Samples Received	**09/04/2018**
Diffusion Tube Type	**Tenax**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA 09210**
Gradko Lab Reference	**02M0533**
Sample Volume (L)	**3**
Sample ID	**BF MAR 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3}
Benzene	U	6.9	2.3
Toluene	U	15.9	5.3
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	5.7	1.9
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	µgm^{-3}
Total TPHs	200	67

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Tube Number	**GRA 10349**
Gradko Lab Reference	**BLANKTXTA180416_2**
Sample ID	**Laboratory Blank**

BTEX	**Accreditation Status**	ng on tube
Benzene	U	<5.2
Toluene	U	<5.0
Ethylbenzene	U	<5.0
m/p-Xylene	U	<5.0
o-Xylene	U	<5.0

	Estimated ng on tube
Total TPHs	<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.5% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5.2ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**M.Angelova**	**Date of Analysis**	**16/04/2018**
Report Checked By	**Len Gates**	**Date of Report**	**23/04/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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Report Number	**M03166R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0492**
Despatch Note Number	**43008**
Date Samples Received	**01/05/2018**
Diffusion Tube Type	**TXTA**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA06929**		
Gradko Lab Reference	**04M0484**		
Volume (Litres)	**3**		
Sample ID	**BF APR 18**		
	Accreditation		
BTEX	**Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7
		Estimated	
		ng on tube	**µgm^{-3}***
Total TPH		20	6.8

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA10349**	
Gradko Lab Reference	**180508_TXTABLANK_2**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.

Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**08/05/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**09/05/2018**

Analysis has been carried out in accordance with in-house method GLM 13

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LABORATORY ANALYSIS REPORT

Report Number	**M03605R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0556**
Despatch Note Number	**43009**
Date Samples Received	**16/05/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**Quote-34277**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status

U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA11318**
Gradko Lab Reference	**04M0562**
Volume (Litres)	**3**
Sample ID	**BF MAY 18**

BTEX	**Accreditation Status**	**ng on tube**	**µgm^{-3}***
Benzene	U	<5.0	<1.7
Toluene	U	6.0	2.0
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	**µgm^{-3}***
Total TPH	20	6.6

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LABORATORY ANALYSIS REPORT

Tube Number	**001763**	
Gradko Lab Reference	**180521_TXTABLANK_2**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

Analysts Name	**Katya Paldamova**	**Date of Analysis**	**21/05/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**25/05/2018**

Analysis has been carried out in accordance with in-house method GLM 13

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

LABORATORY ANALYSIS REPORT

Report Number	**M04764R**
Customer	**Provectus Remediation** **Edwin Richards Quarry** **Rowleg Regis** **Birmingham** **B65 9DS**
Booking In Reference	**V0742**
Despatch Note Number	**43010**
Date Samples Received	**05/07/2018**
Diffusion Tube Type	**TXTA**
Job Reference	**7032/100993/CGO**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Index to UKAS Accreditation Status

U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**001783**
Gradko Lab Reference	**04M0874**
Volume (Litres)	**3**
Sample ID	**BF JUN 18**

BTEX	**Accreditation Status**	ng on tube	µgm^{-3}*
Benzene	U	<5.0	<1.7
Toluene	U	<5.0	<1.7
Ethylbenzene	U	<5.0	<1.7
m/p-Xylene	U	<5.0	<1.7
o-Xylene	U	<5.0	<1.7

	Estimated ng on tube	µgm^{-3}*
Total TPH	85	28

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

gradko

2187

LABORATORY ANALYSIS REPORT

Tube Number	**GRA02968**	
Gradko Lab Reference	**180718_TXTABLANK_1**	
Sample ID	**Laboratory Blank**	
	Accreditation	
BTEX	**Status**	ng on tube
Benzene	U	<5
Toluene	U	<5
Ethylbenzene	U	<5
m/p-Xylene	U	<5
o-Xylene	U	<5
		Estimated ng on tube
Total TPH		<5

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Overall MU 17.8% for quantitative analysis of BTEX compounds.

Results are not Blank corrected.

Results reported as <5ng on tube are below the reporting limit.
Reporting Limits:
Benzene 5ng
Toluene 5ng
Ethylbenzene 5ng
m/p-Xylene 5ng
o-Xylene 5ng
Reporting limit for non BTEX compounds are derived from the non-specific standard Toluene.

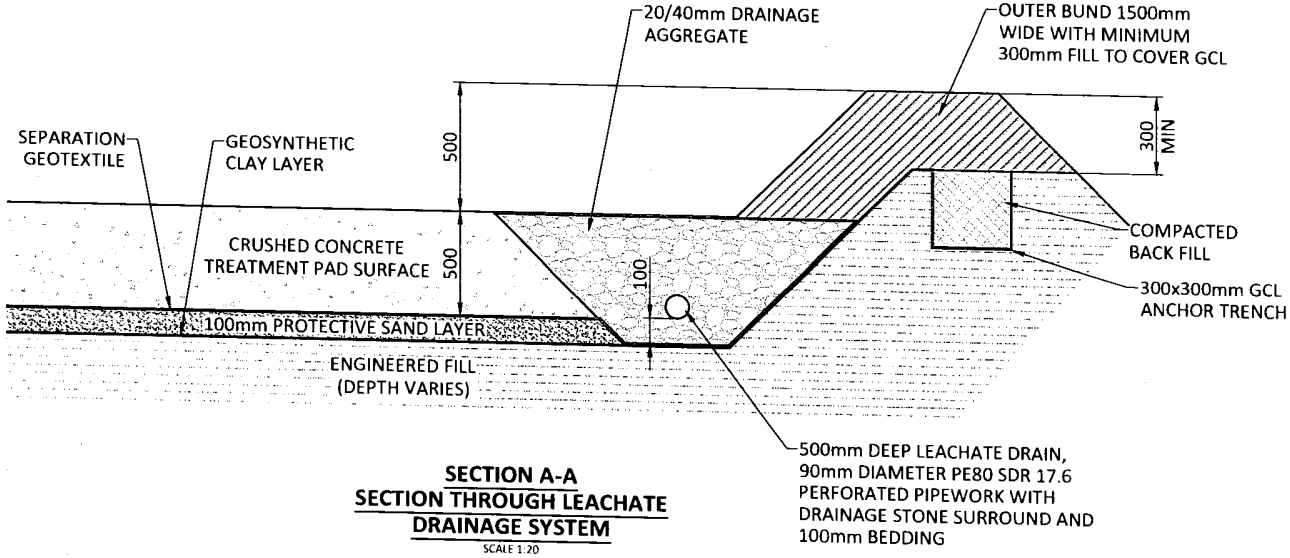
Analysts Name	**Katya Paldamova**	**Date of Analysis**	**17/07/2018**
Report Checked By	**Mariella Angelova**	**Date of Report**	**20/07/2018**

Analysis has been carried out in accordance with in-house method GLM 13

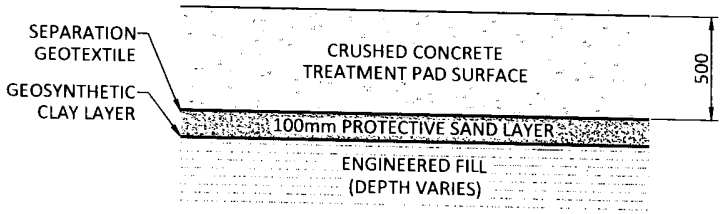
REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

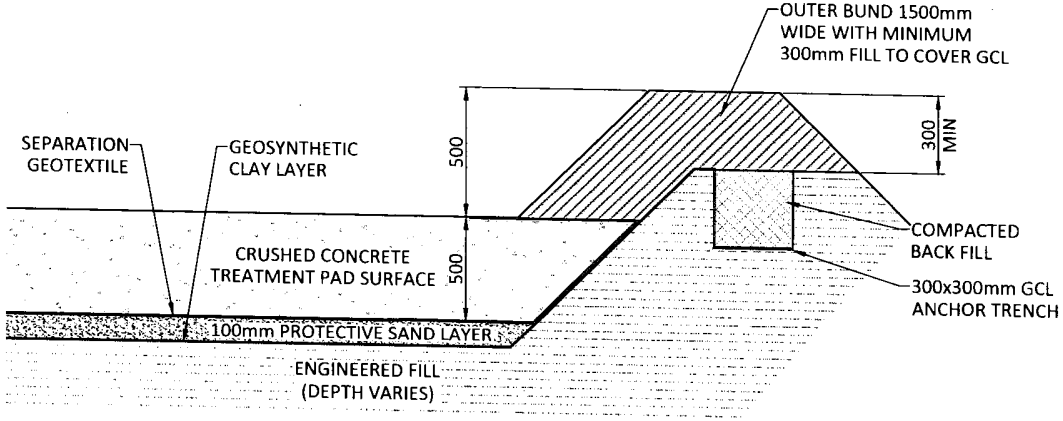
Registered Office: Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG
Tel: 01248 672666
Fax: 01248 672601
Email: contact@caulmert.com
Web: www.caulmert.com



SECTION A-A
SECTION THROUGH LEACHATE DRAINAGE SYSTEM
SCALE 1:20



SECTION B-B
SECTION THROUGH TREATMENT PAD
SCALE 1:20



SECTION C-C
SECTION THROUGH TREATMENT PAD & EDGE BUND

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. SECTIONS POSITIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-V-1808

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	AMENDED TO ENGINEERS COMMENTS	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SECTIONS DRAWING

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF.	REVISION
05.02.2020	AS SHOWN	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-C-1806

Caulmert
engineering environmental planning

NOTES

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER

REV	MODIFICATIONS	BY	RF	AP	DATE
P02	WHEEL WASH POSITION AMENDED	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: fcc Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

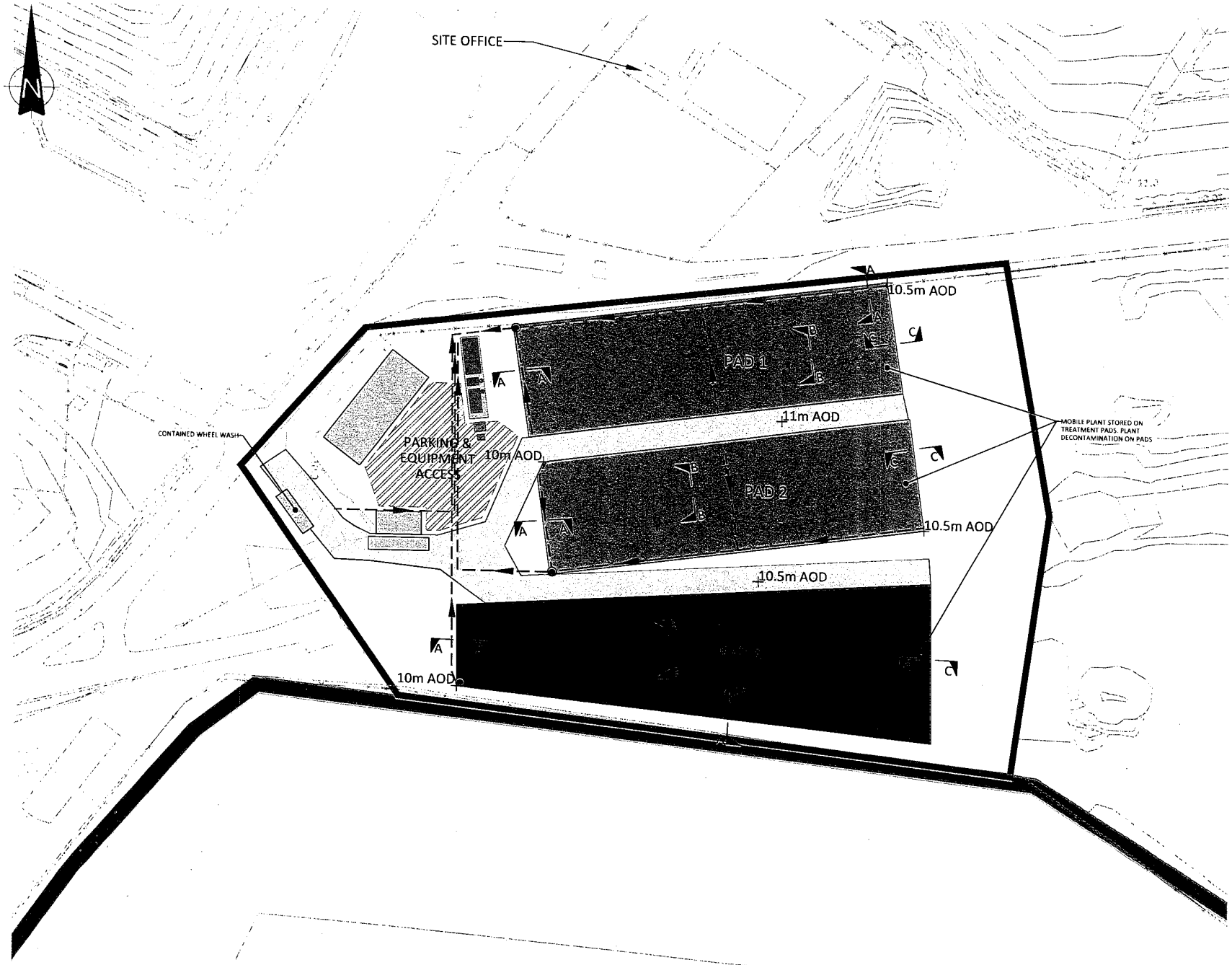
TITLE:
SOILS TREATMENT
PADS 1 / 2 / 3
SITE LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF	REVISION
29.09.2021	1:1000	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1807

Caulmert
engineering environmental planning



NOTES

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- CONNECTION BETWEEN PUMPING CHAMBER AND WATER TREATMENT SYSTEM
- WATER COLLECTION & PUMPING CHAMBER

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: fcc Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

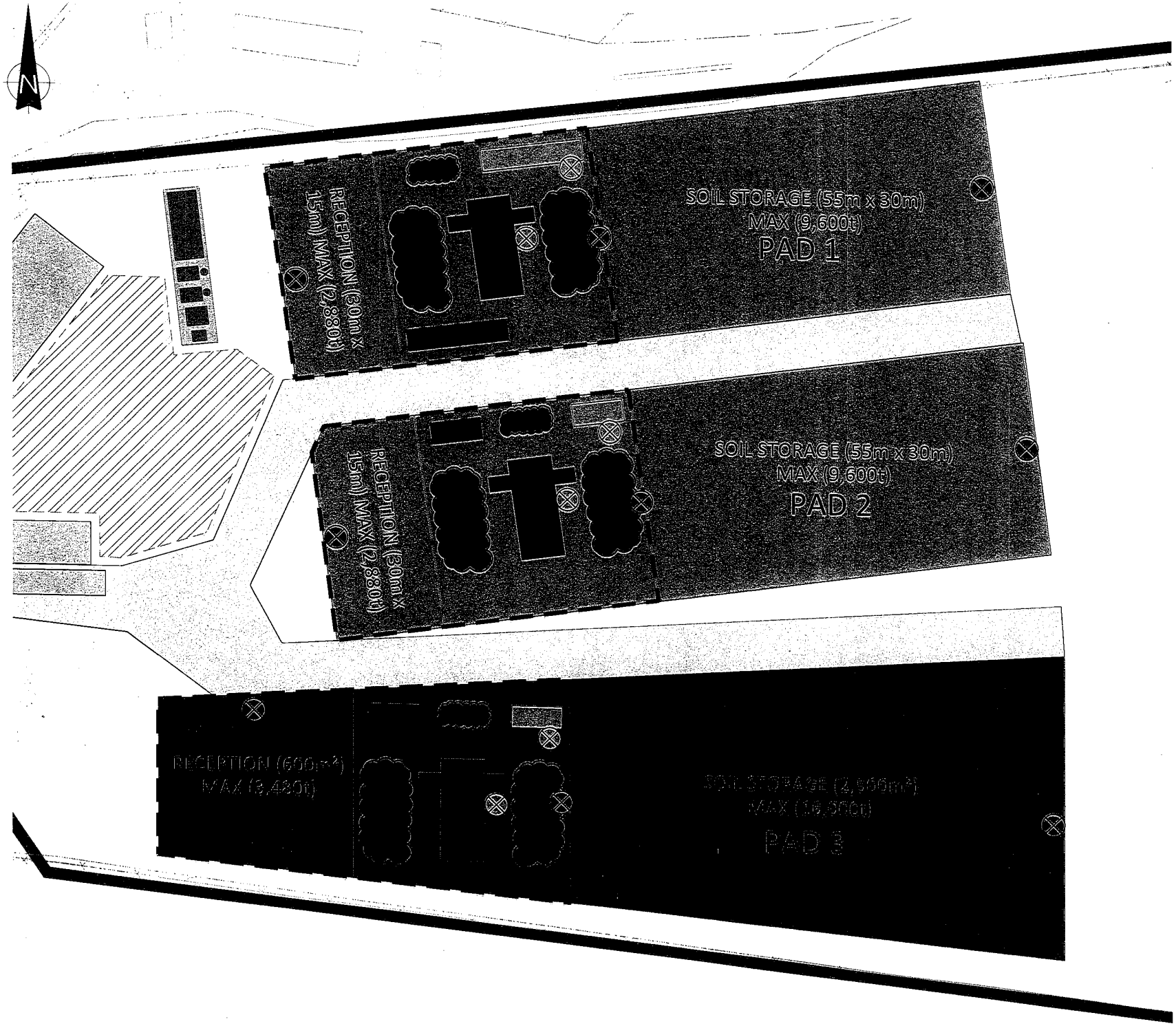
TITLE: SURFACE AND FOUL WATER LOCATIONS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF.	REVISION
29.09.2021	1:1000	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1808

Caulmert engineering environmental planning



NOTES

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- <0.0005f/ml ASBESTOS MONITORING POINT
- HAND HELD VOC's (PID) AND DUST MONITORING (NEPHELOMETER) LOCATIONS INCLUDING RECORD OF VISUAL DUST

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

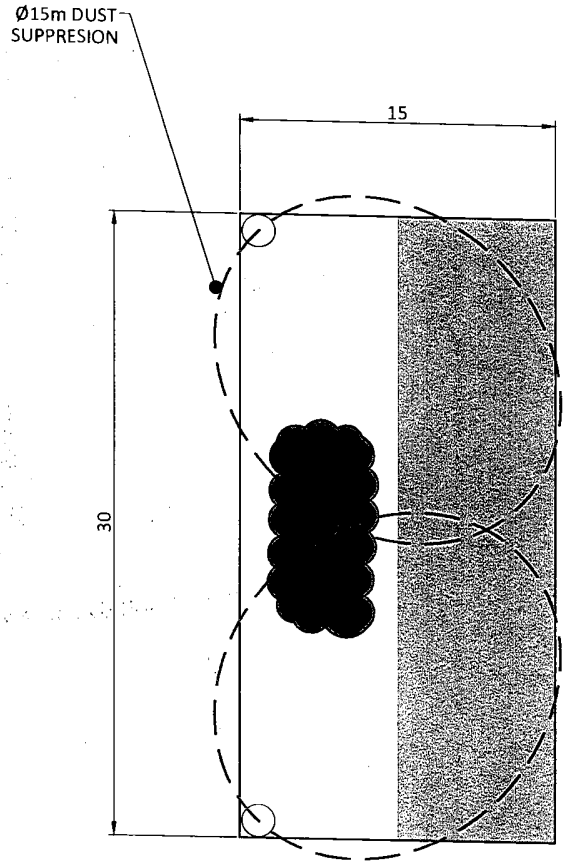
TITLE: EMISSIONS MONITORING PLAN FOR DUST, ASBESTOS AND VOC's PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

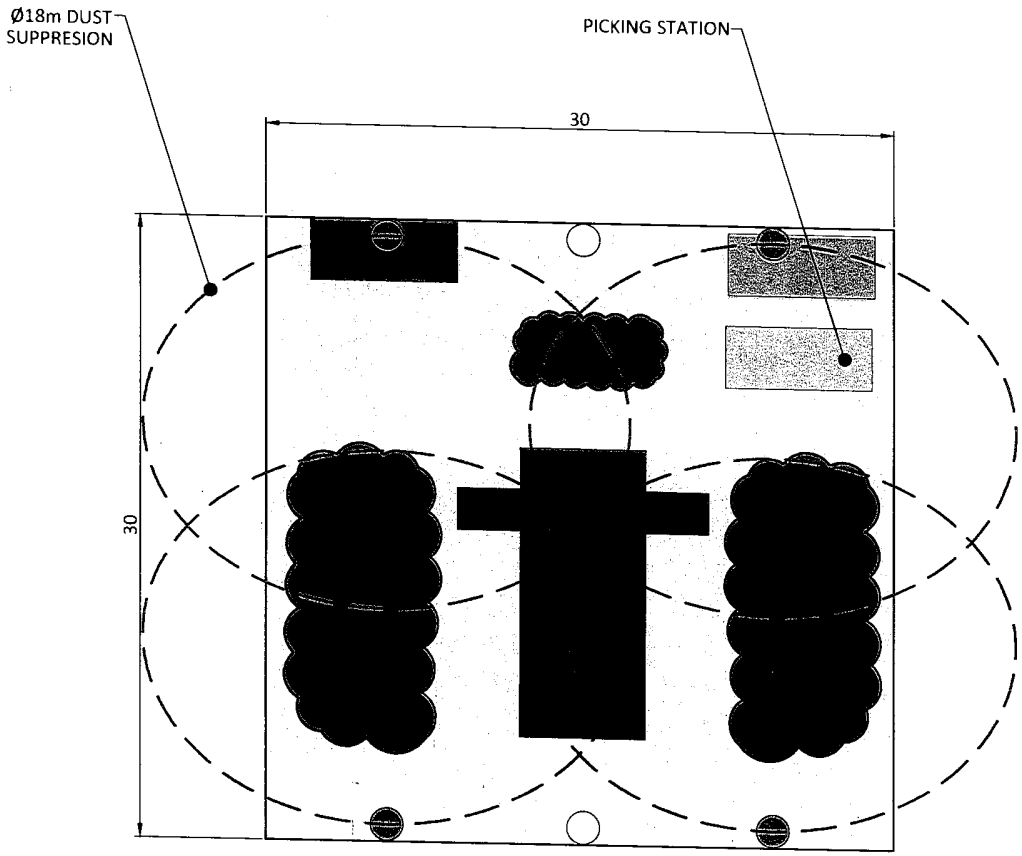
DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:500	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1812

Caulmert engineering environmental planning



SOIL RECEPTION AREA



SOIL TREATMENT AREA

NOTES

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- UNCOVERED SOILS (DAILY INPUTS)
- COVERED SOILS AWAITING RECEPTION TESTS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- SUPPRESSION SYSTEMS SPRAY ARCS

REV	MODIFICATIONS	BY	RF	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

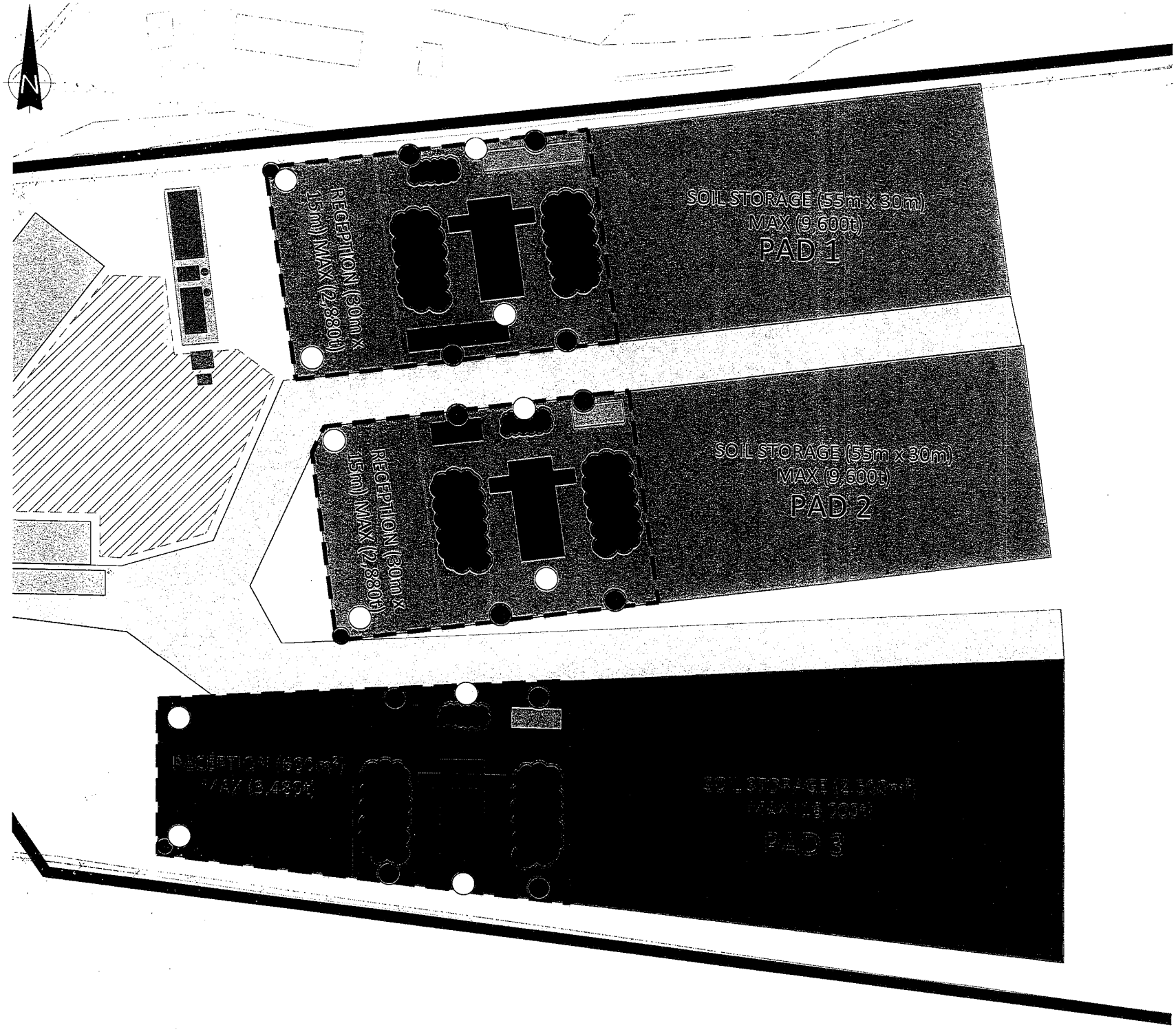
PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SUPPRESION SYSTEM SPRAY ARCS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A3	JOB REF	REVISION
29.09.2021	1:250	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1811

Caulmert engineering environmental planning



NOTES

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- WATER COLLECTION AND PUMPING CHAMBERS

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SUPPRESSION SYSTEMS LOCATION FOR TREATMENT PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF.	REVISION
29.09.2021	1:500	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1810

Caulmert engineering environmental planning

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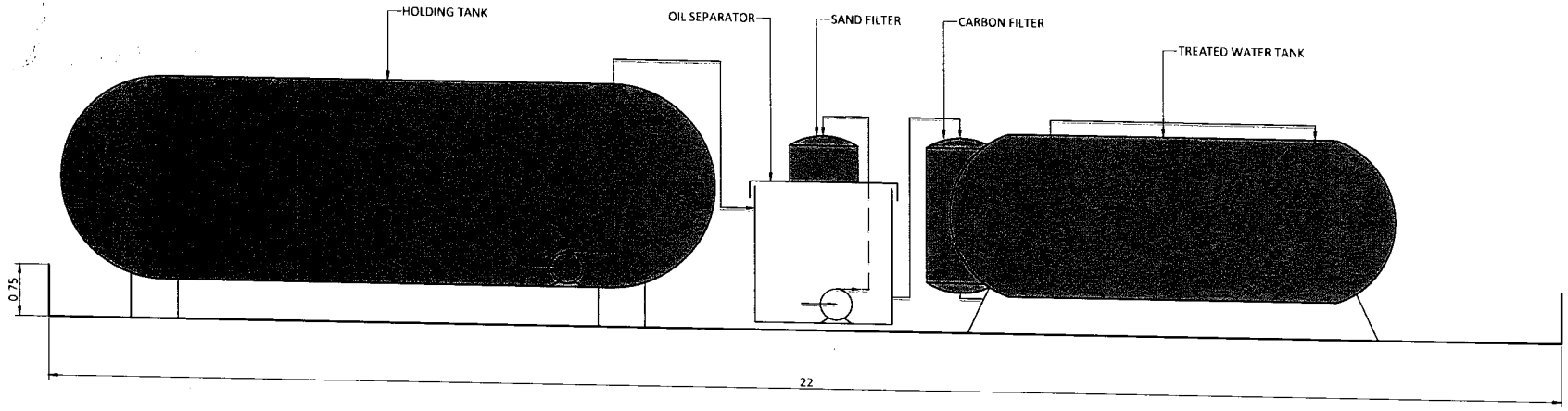
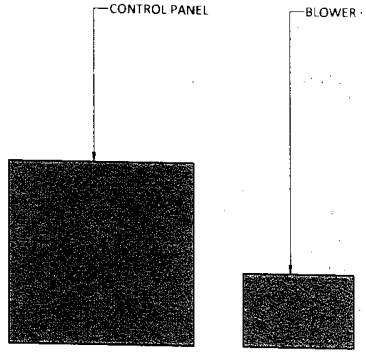
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS





REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: WATER TREATMENT PLANT DESIGN AND CONTAINMENT

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	SCALE @ A2	JOB REF.	REVISION
29.09.2021	1:50	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1809

Caulmert engineering environmental planning

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-30077-1
Initial Date of Issue:	06-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Jon Owens Sam Gould
Project	100993 Rowley Regis STC
Quotation No.:	Q21-25188
Order No.:	9/RR
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	06-Sep-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	31-Aug-2021
Date Instructed:	31-Aug-2021
Results Due:	06-Sep-2021

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-30077
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1269261
Order No.: 9/RR			Client Sample Ref.:		Asb 1
			Sample Location:		Asb Water
			Sample Type:		WATER
			Date Sampled:		27-Aug-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-31891-1
Initial Date of Issue:	18-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould
Project	100993 Rowley Regis STC
Quotation No.:	Q21-25188
Order No.:	9/RR
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	18-Sep-2021
Approved By:	

Date Received:	15-Sep-2021
Date Instructed:	15-Sep-2021
Results Due:	21-Sep-2021

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd					**Chemtest Job No.:**	21-31891
Quotation No.: Q21-25188					**Chemtest Sample ID.:**	1278758
Order No.: 9/RR					Client Sample Ref.:	Asb 3
					Sample Location:	Asbestos Water
					Sample Type:	WATER
					Date Sampled:	10-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected	

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
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U/S	Unsuitable Sample
N/E	not evaluated
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SOP	Standard operating procedure
LOD	Limit of detection

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
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Sample Retention and Disposal

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If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-32698-1
Initial Date of Issue:	24-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould
Project	100993 Rowley Regis STC
Quotation No.:	Q21-25188
Order No.:	9/RR
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	24-Sep-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	21-Sep-2021
Date Instructed:	21-Sep-2021
Results Due:	27-Sep-2021

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-32698
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1283034
Order No.: 9/RR			Client Sample Ref.:		Asb 4
			Sample Location:		Asbestos Water
			Sample Type:		WATER
			Date Sampled:		17-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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All results are expressed on a dry weight basis

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For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

STC – WI 003 - SOIL CHARACTERISATION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
7	Slight change in wording	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the sampling of soils received at the STC. See procedure STC – WI 002 Soil Reception for background information.

Objectives

The main objective of the operation is to ensure soils received at the Soil Treatment Centre (STC) are visually, structurally and chemically similar to those described by the waste producer during pre-acceptance, and therefore compliant with the Environmental permit and suitable for treatment and reuse. This will allow any non-conforming waste to be rejected.

Procedure

The sampling of soils will be performed by the STC technician or STC site manager. The procedure uses composite sampling methods as provided in BS812.

A minimum of at least one composite sample must be taken from each job (unique authorisation code/DW number) at the minimum frequency highlighted in Table 1 below. The STC site manager shall assess how many samples shall be sent to the laboratory for reception compliance testing, based on visual assessment, high risk job, knowledge of the client, material variation etc. Chemical testing is undertaken to ensure that the materials being tipped are consistent with the analysis and description provided by the client at the pre-characterisation stage.

Any additional samples taken which are not sent for chemical testing shall be stored in an appropriate storage place until the job/batch is disposed of.

Table 1: Requirements for sampling:

Volume of soil (t)	No. of samples needed (before or during acceptance at STC)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

The general suite of analysis for soils shall include:

- pH

- CLEA Metals
- Total TPH
- Total PAHs
- Total Cyanide
- Phenols
- SVOCs and VOCs (where required)
- PCBs (where required)
- Asbestos (screen and stage 2/3 quantification where asbestos is identified)
- Moisture content

However, these parameters may be adapted by the STC operations manager due to prior knowledge of contaminants derived from client waste description, history and data.

All analysis will be undertaken by a UKAS/MCERTS accredited laboratory using accredited methods.

Once the analysis results are received, they will be assessed by a suitably qualified and experienced STC manager to confirm they meet the requirements for treatment. These results are to be stored electronically onto the STC server.

Wastes of a liquid oil phase are not permitted for treatment at the site.

The contaminant limits are for the receiving batches. The contaminant levels will be assessed from the reception analysis and the mass within the soil inputs calculated. This would be compared to the mass of contaminant within the receiving batch. This will ensure that the soils are suitable to be added to the receiving batch whilst respecting the average hydrocarbon concentration.

The receiving batch has contaminant limits (these are not contaminant limits for soil inputs which can vary and exceed the average batch limits). The hydrocarbons in the batches will be limited to an average as shown in Table 2.

Concentrations for inorganics to be reviewed in accordance with WM3 (Jan 2021).

Asbestos concentrations to be assessed using criteria in Table 3, stage 3 quantification results to be received prior to any form of soil treatment commencing.

Should the results not conform to the requirements for treatment the waste will be rejected following the formal rejection procedure.

Table 2. Maximum Average Contaminant Concentrations for Receiving Batch

Substance	Carbon Range	Lower Elimination Rate	Upper Elimination Rate	Maximum average batch concentration (lower level) - mg/kg	Maximum average batch concentration upper level) - mg/kg	Comments
Petrol range organics	C6-C10	95%	99%	20,000	100,000	Limited by odour potential
Diesel	C10-C25	60%	90%	2,500	10,000	Target of below 1,000mg/kg for reuse even though diesel is only hazardous at 1% (10,000mg/kg)
Lube Oils	C25+	40%	65%	1,667	2,857	Review age of spill and soil type before assessing which elimination rate to use
Unknown Oil	C10+	40%	80%	1,667	5,000	Review age of spill, source and soil type before assessing which elimination rate to use
PAHs	C10+	30%	90%	1,429	10,000	Limited by odour potential
Phenols	C6+	90%	99%	10,000	100,000	Limited by odour potential
Solvents	C2+	95%	99%	20,000	100,000	Limited by odour potential
VOCs	C2+	99%	99%	100,000	100,000	Limited by odour potential

Table 3. Maximum Asbestos Contaminant Concentrations for Treatment

Substance	Maximum concentration (%) - Stage 3 Testing	Comments
Chrysotile	<0.1%	Bound forms of ACM only
Amphibole ACM Types	<0.01%	Bound forms of ACM only
Asbestos insulation/unbound asbestos	Absent	No acceptance of any form of asbestos in friable/insulation form

STC – WI 002 - SOIL RECEPTION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
6	Inclusion of asbestos procedures	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the assessment of data and inspection of waste received at the Soil Treatment Centre (STC). It allows rejection of non-conforming waste to ensure no untreatable contaminates are accepted into the STC, or which breach the list of permitted wastes as shown in the site's Environmental permit.

Principle of Operation

The inspection will allow the following to be assessed prior to acceptance:

- Presence of untreatable and hazardous materials (e.g. tars, clinker etc.) in the contaminated soil.
- Presence of excessive litter/debris in the contaminated soil.
- Compliance with the previously supplied chemical/physical analysis information (supplied by waste producer).
- Potential for the waste to behave as a liquid or have free water/oil in the waste.
- Inspect asbestos debris and visual appearance to ensure no unbound/insulation forms of asbestos are present

If the waste material is not compliant with the agreed conditions of the Environmental Permit or pre-acceptance assessment then the waste will be rejected.

Procedure

Pre-Acceptance Assessment

This is undertaken by Provectus to confirm treatability to meet the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer. These are agreed in writing between the Waste Producer and Provectus prior to an authorisation number (DW/enquiry number) being issued by FCC for deposit at the STC.

Where data gaps exist or queries remain about the suitability of material for treatment, Provectus will offer to attend the site of origin to undertake pre-acceptance analysis and visually inspect the material and obtain further information about the waste description.

In the event that the moisture content of the waste being in the range of 25-30% then the potential for free water or oil will be further reviewed. Where moisture contents are at this level or even higher and the material does not behave as a liquid, have the potential for releasing water/oil etc and is suitable for the biopile infrastructure then it would be accepted on a case by case basis.

Should either Provectus, or after consultation, FCC determine that there is the high potential for material to behave as a liquid or contain free water or oil then the waste will be declined for acceptance.

Duty of Care Documentation

No tipping on the STC will be permitted without relevant duty of care documentation from the waste producer. This must be checked on-site at the STC to ensure that the load is indeed destined for the STC, and that the documents are correctly completed. The consignee section of Consignment notes, for hazardous waste, and waste transfer notes, for non-hazardous waste, shall be completed by Provectus at the STC once the load has been deemed acceptable by the STC site manager.

Health and Safety

The STC site technician or STC site manager is to provide guidance to the tipper driver as to where to tip the load along with any relevant safety information, such as PPE requirements, prior to tipping. Site personnel must be at least 5m away from any moving plant or lorries on site at all times and must only approach if it is safe to do so and the driver has acknowledged them.

Visual Inspection: Waste Input

Each load of soil for inspection will be initially tipped onto the biopile/quarantine area. The STC site technician will inform the tipper driver to remain at the area until the inspection has been completed.

In the event of the material containing free water or oil, or any form of asbestos insulation/unbound asbestos types the load will be immediately rejected.

If available, an excavator will be used to expose any unsuitable materials and allow a comprehensive visual assessment. The STC site manager will determine the next action when this has been completed, this will comprise of the following:

- Waste is accepted and the tipper is permitted to leave the STC with the accompanying completed paperwork, or;
- Waste is not accepted and the unsuitable element of waste load, either partial or complete load is removed by excavator and placed back into the tipper. A rejection form is filled in on-site and both Landfill Manager (LM) and Sales Manager (SM) are informed. It is the duty of FCC to inform the Environment Agency of any rejected loads.

At the end of the waste acceptance procedure the soil will be placed into a stockpile for reception testing. All soils with bound asbestos debris to be formed into a stockpile covered with a tarpaulin prior to treatment. Co-ordination of soil treatment events is to be decided by the STC site manager.

Quarantining Loads: Procedure

In the event that a load is received that is suspected of containing non-conforming wastes or requires additional analysis that is detrimental to the reuse of the material post treatment, then this will be placed in the quarantine area on site. However, if the material is not at risk of being mixed with other inputs then it may be placed in an allocated biopile with its location recorded. The load(s) placed into quarantine will be segregated from other inputs. The stockpile will be labelled with a sign with the following information:

- DW Number
- Project Name
- Tonnage
- Date sampled

As soon as the chemical analysis is received it will be reviewed by the STC operations manager before being formally accepted or rejected from site.

Chemical Analysis: Waste Input

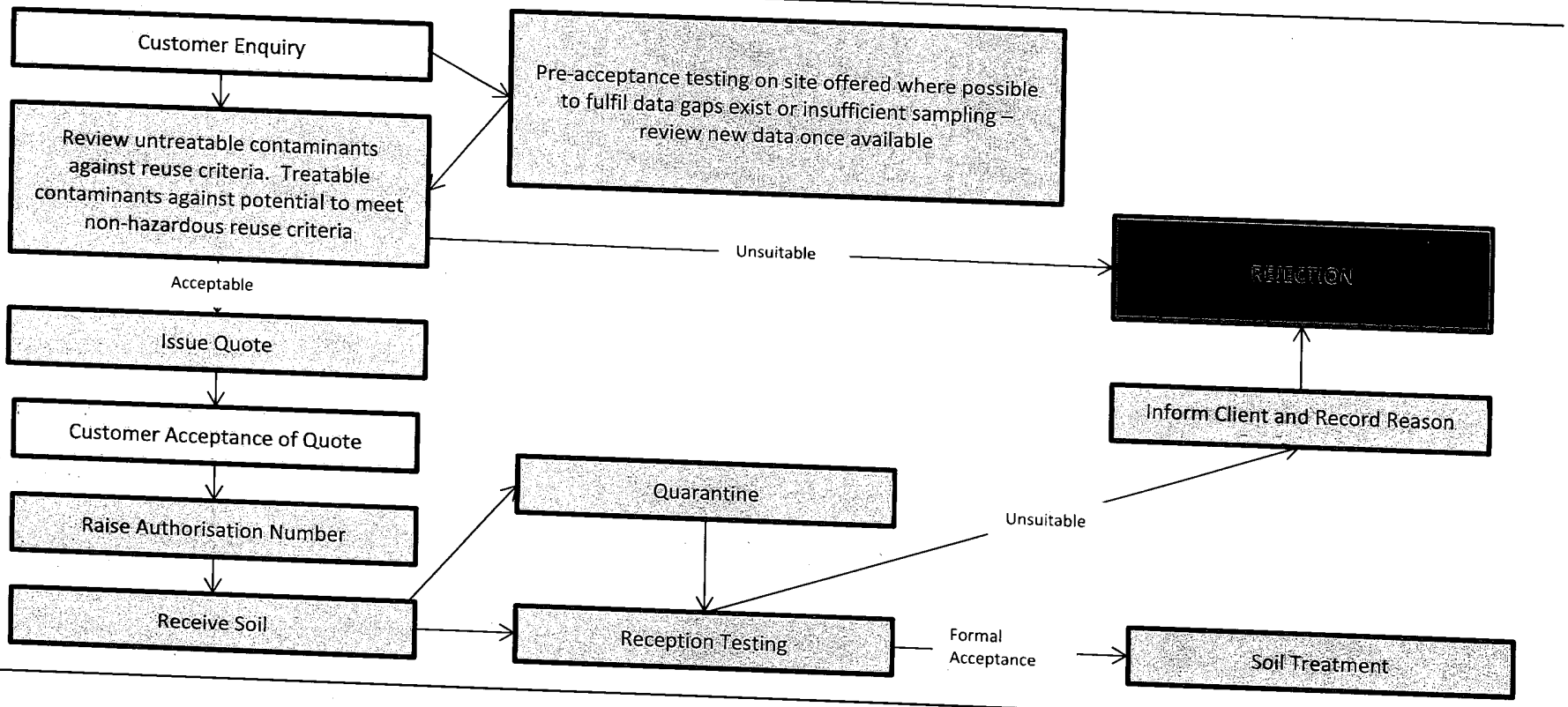
As a minimum, the sampling frequency for soils will be as per STC WI for each DW/enquiry. The STC site manager may increase the frequency of the sampling based on visual or olfactory evidence; Sampling will be undertaken on soils using composite sampling methods described in BS812.

The range of contaminants for analysis will be based upon the original contaminating substances. A copy of the analysis shall be checked by the STC site manager for verification against the original client data. In the event of non-conformity, the STC operations manager shall liaise with the STC project manager, and a decision on the next course of action will be taken.

The waste will only be formally accepted once reception analyses are received and approved in accordance with Soil Assessment Procedure illustrated in STC-PR02-V6 below.

STC-PR02-V6

Soil Assessment Procedure



PROVECTUS

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CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: Provectus Soils Management
Regent House
Bath Avenue
Wolverhampton
WV1 4EG

CONTRACT NO: S20825

DATE OF ISSUE: 20.09.21

DATE ANALYSIS REQUESTED: 16.09.21

DATE SAMPLES ANALYSED: 20.09.21

SAMPLES: Five airborne dust samples each supplied as two half gridded MCE membrane filters.

ANALYSIS REQUESTED: Fibre Counting using Scanning Electron Microscopy (SEM) with fibre identification by Energy Dispersive X-ray Spectroscopy (EDXS)

METHOD:

Each pair of half membrane filters is ashed in a low temperature plasma asher. The combined residue from each pair is recovered using filtered, distilled water and filtered through a 25mm, 0.4µm pore size polycarbonate filter. A portion of each polycarbonate filter is excised and mounted on a 13mm aluminium stub, coated with gold and examined by SEM. Each filter is searched systematically at 2000X magnification until an area of 1mm^2 has been examined or 50 whole fibres found. All respirable fibres (aspect ratio >3:1, length >5µm and diameter <3µm and including fibres in contact with particles >3µm diameter) detected are analysed by EDXS and identified as closely as possible, by comparing morphology and composition with standard reference materials. Fibre counting rules based on those of ISO14966:2019 were used.

The method used for analysis is documented in IOM instruction manual No.1 and is based on **International Standards Organisation (2019), International Standard 14966, Ambient Air: Determination of numerical concentration of inorganic fibrous particles - Scanning electron microscopy method.**

www.iom-world.org

Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

IOM CONSULTING LIMITED, registered in Scotland No. SC206870

UKAS TESTING
0374

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

RESULTS:

Client Ref: PO – RR151

Sample No.	Volume (l)	[1] No. of Resp. Fibres Found	[1] No. of Fields Searched	Total Fibres *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	AMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	CMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	MMMF *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	NAM Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*
ERQ 1+2	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 3+4	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 5+6	1440	1	150	1 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1 / <0.0005*
ERQ 7+8	1440	1.5	150	1.5 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1.5 / <0.0005*
ERQ 9+10	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*

AMX-Amphibole Asbestos **CMX**-Chrysotile Asbestos **MMMF**-Machine Made Mineral Fibres **NAM**-Non Asbestos Mineral

* DETECTION LIMIT

When no fibres of a given type are detected, the fibre concentration can be reported as less than the concentration equivalent to three fibres (the one sided upper 95% confidence limit of the Poisson distribution). Therefore, when 0, 1 or 2 fibres are detected, 2.99 is used in the calculation of fibre concentrations. It expresses the 95% confidence detection limit for airborne fibre concentrations. When a volume of 1440 litres is used the 95% confidence limit is 0.0005 fml^{-1} for the number of fields searched.

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

COMMENTS:

No asbestos fibres were detected during the analysis of any of these samples.

Any organic fibres present on the original samples would be destroyed during plasma ashing.

Each sample supplied for analysis comprised two half membrane filters. These were combined during plasma ashing to form single samples with combined sample volumes of 1440 litres.

(1) UKAS accreditation for this work is limited to results obtained directly from the analysis. Calculated results based on sampling information provided by the client are out with the scope of this accreditation.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

IOM Consulting cannot accept responsibility for samples sent for analysis that have been incorrectly collected or despatched.

AUTHORISED BY: Steve Clark

S Clark
Mineralogy Section Manager

IOM

working for a healthy and sustainable world

CERTIFICATE OF ANALYSIS

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CONTRACT NO: S20825
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AUTHORISED BY: Steve Clark

S Clark
Mineralogy Section Manager

Decontamination of asbestos contaminated plant.

This memo is produced by HSENI to provide information and guidance to duty holders.

hseni
CONTROLLING RISK TOGETHER

What needs to be done?

a. Plant or machinery which has been used in the removal or disturbance of asbestos containing material (ACM), whether deliberate or accidental, is likely to be contaminated with asbestos debris and fibres. Depending on the degree of disturbance of the original material, the plant will be contaminated to a greater or lesser extent. Before it can be returned to service or the hire company, it must be thoroughly decontaminated to a high standard of cleanliness, such that there is no subsequent spread of asbestos or any exposure of persons to asbestos dust. In addition to obvious gross debris, disturbance of ACMs can produce very fine airborne asbestos fibres which can penetrate into the inner parts of the machine on air currents and deposit there.

b. The plant/vehicle should not be moved outside the contaminated area due to the risk of spreading asbestos contamination. Where a vehicle must be moved, the justification for this must be recorded in the Method Statement, together with steps necessary to prevent the spread of asbestos contamination.

c. It is not acceptable merely to power-wash the plant.

Establish how much.

d. To establish how contaminated a machine is may require the help of an accredited analyst, especially if there has been an excessive amount of disturbance of the ACM or disturbance of AIB / insulation; breakage or degradation/delamination of AC.

e. In any event, the person carrying out the assessment must be competent, have appropriate training, personal protective equipment and face-fitted respiratory protective equipment (see below). The risk of fibre release is greater if the disturbance was accidental and there were no controls in place. The assessment should involve a thorough visual examination with a bright torch, looking into trapping spaces, tyres, underneath etc. These should be detailed in the survey/risk assessment. The assessment should begin with the area surrounding the plant and, if necessary, an uncontaminated path to the machine should be established.

A risk assessment and plan of work (POW) are required.

f. A risk assessment should be carried out to establish the requirements for preventing the spread of ACM and exposure to asbestos dust during remediation and a POW (also known as a method statement) developed to describe how the work is to be done safely. In addition to the surface of the machine, consideration should be given to the possibility that asbestos fibres may have been drawn into the cab ventilation system and could potentially be emitted when the system is in operation. It may be necessary to erect an enclosure.

The risk assessment and POW will establish whether a licensed asbestos removal contractor (LARC) will be required to carry out the work. In general, if the contamination consists of 'licensable materials' – asbestos insulation board (AIB), thermal insulation or limpet, then a LARC will be required. Also in cases where there has been significant degradation of asbestos cement products, such as aggressive removal or fire damage, a LARC will be required.

Carrying out the procedure.

g. The persons carrying out the decontamination procedure must be trained at least to the appropriate level i.e. trained to work with non-licensable ACM, or, trained to work with licensable ACM where the contamination contains licensable material. Asbestos awareness training is **not** sufficient.

h. They must wear appropriate protection to avoid being exposed to asbestos fibres. This will normally consist of Type 5 disposable coveralls, P3 respiratory protective equipment (RPE) and non-laced footwear.

i. They must have Employers Liability Insurance which specifically covers working with asbestos containing materials.

j. The area surrounding the vehicle should be delimited by a cordon and hand-picked and visually cleared of ACM. A vacuum cleaner fitted with a HEPA filter may be required.

k. The exterior of the vehicle is likely to be most contaminated, and should be cleaned first. This would involve hand picking all material, ACM and non-ACM that is visible, and paying attention to less obvious places such as trapping places, tyres and the underside. The collected material should be double bagged and disposed of appropriately as asbestos waste.

l. The air intake filters to the engine should be replaced and the contaminated filters disposed of as asbestos waste.

m. The cleaned vehicle should then be wet-wiped and the rags disposed of as asbestos waste. At this point the exterior of the vehicle should be free from ACMs.

n. Consideration should then be given to the cab. The two probable mechanisms whereby asbestos could have penetrated the cab are by being carried in on clothing or footwear, or, by transport through the air, either directly into the cab through the doors or via the ventilation system. The air intake filters should be removed and disposed of as contaminated waste and clean filters fitted. Initially, a small capacity NPU unit should be run in the cab with the engine and the ventilation switched on. This should have the effect of dislodging and removing any fibres from the system and capturing them on the NPU filter.

Remediation would then require thorough cleaning of all surfaces, using appropriate means e.g. wet wiping or vacuuming (using a class H vacuum cleaner) or a combination of both prior to inspection. Moveable items which cannot be cleaned should be disposed of as asbestos waste.

Air sampling should be undertaken inside the cab with disturbance and the ventilation system running.

Certifying.

o. The 'clearance' of the plant for recommissioning or removal from the site must be carried out by a competent person. Where the work involved licensable material or degraded AC, and was carried out by a LARC, then the clearance should be carried out by an accredited analyst. A written declaration that the plant is free from asbestos contamination should be based on a thorough visual inspection of all parts of the machine, including 'trapping' places and air sampling in the cab if appropriate.

p. Assuming that the visual inspection and air test in the cab are satisfactory, the pathway across the ground to the site exit should be visually inspected and cleared of any ACM. When this has been completed, the competent person may release the plant. Care should be taken to ensure it does not become re-contaminated e.g. by the wheels running over material on the ground.

q. Once the plant has been moved, the ground underneath should be assessed for contamination and a method of work devised to decontaminate and clear this area.

NOTE

All work with asbestos needs to be carried out in accordance with the requirements of the Control of Asbestos Regulations (Northern Ireland) 2012 and the associated Approved Code of Practice 'Managing and Working with Asbestos' (L143 second edition)

Further information is available as follows:

- Asbestos essentials http://www.hse.gov.uk/pubns/books/hsg210.htm
- Managing and working with asbestos, Control of Asbestos Regulations 2012. Approved Code of Practice and guidance http://www.hse.gov.uk/pubns/books/l143.htm
- www.hseni.gov.uk
- www.hse.gov.uk/asbestos/

STC – WI 006 - SOIL ANALYSIS

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
4	Minor alteration to wording	01.09.20

Introduction

This procedure relates to the measures to be undertaken for the testing of soils treated at the Soil Treatment Centre (STC). This ensures that soils are suitable when received, are maintained in optimal treatment ranges and are validated in accordance with the permit. Once treatment is complete soils treated at the STC may be reused in several possible ways depending on the site. Namely, as soil for the quarry access road, restoration soils for the quarry backfill works or restoration soil for the landfill site.

Principle of Operation

The main objective of the reuse of soils is to ensure, in accordance with the Environmental Permit, that any material treated by Provectus is reused in a safe and environmentally acceptable manner. Quality control measures are implemented in order to prevent the reuse of soils to destinations either unintended, or unsuitable for the receipt of such soils. This operation is performed in conjunction with FCC, who operates the site where the soils shall be reused.

In-treatment batches of soil are monitored periodically as described in STC WI 004, when a batch of treated soil displays strong chemical evidence of meeting a non-hazardous reuse standard, a 'validation' sample is to be taken to generate a data report. This is to be reviewed by the STC operations manager and can then be sent to FCC to be formally approved for disposal.

Validation sampling should be carried out by the STC site technician or site manager, using a grid formation sampling plan. As a general rule one composite sample should be taken for every 500t.

The reception and validation samples should be submitted for the following analytical tests –

- Metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se & Zn)
- pH
- Speciated TPH (including BTEX)
- Speciated PAHs
- Phenols
- Total Sulphate
- Elemental sulphur
- Free Cyanide
- Total Cyanide
- Asbestos screen

Dependent on the contaminants of concern it may be necessary to request further parameters for testing on validation. Leachate analyses are required for reuse of soils in the restoration part of the landfill in accordance with the agreed risk assessment.

Procedure

Once the soil batch has been analysed by an accredited laboratory, and the results reviewed by the STC operations manager; a validation report shall be complied with information regarding soil volumes, validation analysis results, soil origin and ultimate destination. This shall be communicated to both the FCC Waste Assessment team and to the FCC site manager for approval and so that provisions can be made for the transfer of soils to the approved destination. The validation report and any supporting information shall be stored on the STC server.

APPENDIX A

OUTLINE ASBESTOS IN AIR MONITORING STRATEGY AND METHODOLOGY

1. **Outline Air Monitoring Strategy for Asbestos-Contaminated Soil Processing Operations at the Daneshill Soil Treatment facility (STF)**

2. Respirable asbestos fibres have the potential to cause serious health affects if inhaled in significant concentrations. This potentially could have an impact upon both exposed Site operatives and visitors to Site, in addition to people outside of the Site who may become exposed to significant fugitive emissions.

3. In order to demonstrate that the operational controls that will be put in place to mitigate the potential risks of exposure to respirable asbestos fibres are sufficient to eliminate significant risk, FCC will undertake monitoring for respirable asbestos fibres to check that fibres are not being released into the atmosphere on- and off-site.

4. In most circumstances, however, it is recognised that the extent of dilution in the environment of the very low levels of fugitive respirable asbestos fibres in air that may be anticipated from the proposed operation of the Site, will be considered sufficient to discount any significant exposure to members of the public over 100m from a potential source of any fugitive emissions arising from routine operations at the Site.

5. Asbestos in air monitoring will be undertaken generally in accordance with the provisions of HSE document 'HSG248'[1] by a laboratory accredited by UKAS to SO/IEC 17025 at the Site as identified below:

    a. Baseline ambient monitoring conducted on the proposed site of the proposed STF (baseline activity monitoring)

    b. Baseline ambient monitoring conducted at selected locations on the boundary of the Site, both upwind and downwind of the proposed STF (baseline boundary monitoring)

    c. Routine ambient monitoring conducted adjacent to potential dust-generating activities during representative periods of operation of the STF

    d. Routine ambient monitoring conducted at selected locations (as in b. above) on the boundary of the Site, both upwind and downwind, during representative periods of operation of the STF (operational activity monitoring)

6. Since it is highly unlikely that any employee carrying out operations on the Site will be subjected to elevated airborne asbestos concentrations approaching or exceeding the Control Limit of 0.1 fibres/ml averaged over four hours, or the Short-Term Exposure Limit of 0.6 f/ml over any 10-minute period, the need for personal sampling may be discounted.

[1] Health and Safety Executive. Asbestos: the analysts' guide for sampling, analysis and clearance procedures. HSG248. 2006. HSE.

7. It is recognised that boundary monitoring has its limitations; the primary emphasis when mitigating potential risks should be on ensuring control of exposure and spread of asbestos **at source** during operations that could potentially generate fugitive emissions.

8. Consequently, FCC will place significant reliance on ensuring that the operational controls that are set out in the Asbestos Plan of Work (APOW) and based on the Asbestos Risk Assessment (ARA) are monitored effectively and that any perceived failure or reduction in performance of these will trigger a 'Work Stop' action and a comprehensive of the ARA and APOW.

9. Consequently, less reliance will be placed on boundary monitoring results to flag when a review of controls is required, rather the monitoring will be conducted as a means of providing reassurance to management, the regulators (Environment Agency and the Local Planning Authority) and members of the public that operations are being sufficiently well-controlled in accordance with the **As Low as is Reasonably Practicable** (ALARP) principle so as to present negligible risk.

10. It is anticipated that both baseline and operational boundary monitoring samples will be collected from a maximum of four boundary locations representative of potential off-site receptor risks, to be determined.

11. It is anticipated that baseline and operational activity monitoring samples will be collected from a minimum of two locations representative of on-site activities, to be determined.

12. Outline Sampling and Analytical Strategy

13. The objective of the sampling strategy is to permit most samples taken on-site during the course of a day to be analysed on-site same day by the Analyst.

14. The sampling methodology implemented by the Analyst based on this outline strategy will be such that the Limit of Quantification (LOQ) of the method used for sampling and analysis on site, for a total of 20 fibres counted using phase contrast optical microscopy (PCOM), will be no greater than 0.002 fibres/ml for baseline and routine activity monitoring samples and 0.0005 fibres/ml, the WHO guideline value[2], for baseline and routine boundary monitoring

15. The LOQ is expected to be achieved by using a sample pooling approach, nominally with the following variable sampling and analysis parameters:

Baseline and routine activity monitoring

a. Number of filters per pooled sample – 2
b. Sample flow rate – 15 litres/minute
c. Sample duration – 80 minutes
d. Litres per sample filter – 1,200
e. Minimum average graticule areas counted per sample filter – 200

Baseline and routine boundary monitoring

f. Number of filters per pooled sample – 4
g. Sample flow rate – 15 litres/minute
h. Sample duration – 160 minutes
i. Litres per sample filter – 2,400
j. Minimum average graticule areas counted per sample filter – 200

[2] WHO. Air quality guidelines for Europe. WHO Regional Publications, European Series, No. 91. 2nd edition. 2000. WHO Regional Office for Europe

16. The Analyst will verify that the minimum LOQ can be achieved by reference to HSG248 and specifically calculate and report the final result in accordance with the formula and requirements of Appendix A1.35.

17. Routine activity monitoring will be undertaken at representative locations close to the activities being carried out, but not in such close proximity as to increase the potential for sample filters to become occluded by dust particles, or for the operations themselves to interfere with the safe operation of the sampling pumps.

18. Routine boundary monitoring will be undertaken at three locations downwind and one location upwind of the operations being carried out. Sampling locations must be selected to ensure that there is minimal possibility for members of the public to interfere with the safe operation of the sampling pumps.

19. Samples will be taken at a height of 1.5 to 2m above ground. The sampling flow rate will be set to achieve a minimum sample volume over a specified time period as above.

20. The monitoring at each location will comprise the use of a reliable battery-operated high-volume flow-compensated air-sampling pump and a 25mm diameter mixed ester of cellulose or cellulose nitrate membrane filter of 0.8 to 1.2um pore size with a printed grid mounted in a thoroughly cleaned sampling head and cowl all in accordance with the provisions of HSG248.

21. Pumps must be capable of:

    - giving a smooth airflow;
    - having flow set to within ±5% for flow rates >2 litres.min^{-1};
    - maintaining this flow rate during the period of sampling.

22. The pump's battery must have sufficient power to operate within the specified flow limits for the duration of the measurement.

23. Outline Analytical Strategy – Extended Analysis

24. The PCOM fibre counting method does not distinguish between asbestos fibres and other fibres that may be present in the air (e.g. gypsum, mineral wool, fibreglass, cellulose etc.).

25. Accordingly, provision will be made by the Analyst to retain one half of each sample filter to be sent off-site for analysis by scanning electron microscopy coupled with energy-dispersive x-ray analysis (SEM-EDXA), should the need arise due to elevated PCOM total fibre counts, to positively identify asbestos fibres to a quantification limit of less 0.0005 fibres/ml.

26. Quality Assurance

27. FCC will ensure that an effective quality assurance/quality control (QA/QC} system will be put in place to ensure high-quality results and to eliminate invalid data.

28. Operational Monitoring and Response Standards

29. In order to serve as a cross-check on the efficiency of operational controls, in the absence of any perceived failure or reduction in performance of these, the thresholds in Table 1 will be adopted:

Table 1 – Monitoring Thresholds and Alert Levels

Routine activity monitoring		Routine boundary monitoring	
Green Alert	<0.002 fibres/ml < 5 fibres counted	Green Alert	<0.0005 fibres/ml < 5 fibres counted
Amber Alert	<0.002 fibres/ml > 5 and <10 fibres counted	Amber Alert	<0.0005 fibres/ml > 5 and <10 fibres counted
Red Alert	[illegible]	Red Alert	[illegible]

30. For routine activity monitoring:

Table 2 – Monitoring Alert Levels and Actions

Routine activity monitoring and Routine boundary monitoring	
Green Alert	Normal operational state.
Amber Alert	Conduct review of wind direction for potential off-site contributory factors. Conduct review of waste input materials. Conduct operational checks on fugitive dust controls; increase as necessary. Initiate repeat sampling as appropriate. Enter report in Site Log.
Red Alert	[illegible]

31. Reporting

32. All monitoring data will be held on site in an accessible format for the purposes of regulatory inspection and compilation of management reports.

BAT 14 Information

BAT 14

In order to prevent, or where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds, and odour. BAT is to use an appropriate combinate of the techniques A-H. At Daneshill landfill site the following techniques will be conducted to ensure that the activities at Daneshill Soil Treatment Facility are in compliance with BAT 14.

1) Minimising the number of potential diffuse emission sources
2) Containment, collection, and treatment of diffuse emissions
3) Dampening down
4) Maintenance of equipment (already covered in existing BAT document, ref: 3982-CAU-XX-XX-RP-V-0306)
5) Regular cleaning of waste treatment and storage areas (already covered in existing BAT document, ref: 3982-CAU-XX-XX-RP-V-0306)

The EA have raised concerns that the movement, handling, and treatment operations on asbestos containing materials has the potential to agitate and release any fugitive/fibre emissions. Monitoring of asbestos emissions at the operator's other active site with the presence of identical mitigation measures described herein has demonstrated that there have been no emissions at any point in excess of either the WHO air quality guidance levels of <0.0005f/ml or the permit threshold of <0.01f/ml. Notwithstanding this, the operator will implement control measures to provide robust assurances that asbestos emissions are always prevented. Daily monitoring during all soil movement activities will validate this approach to ensure it is as effective as implemented on the operator's other site. The suppression system that will be used at Daneshill Soil Treatment facility will provide a fully encompassed misting system with overlapping arcs between misting units which has been designed to contain any potential particulate emissions and provided suppression for the activities carried out on site; please see 'BAT 14a Dampening' section further detail in this response. Additional measures include (further detail provided in subsequent paragraphs):

1) Sheeting and enclosure: Storage of asbestos containing materials
2) Segregated storage and processing area for asbestos containing soils
3) Enclosure of asbestos picking station, screening decks and conveyors as per Figure 1 provided later within this document
4) Storage of double bagged hand-picked asbestos debris and used PPE in an enclosed lockable skip (post- treatment from picking station)
5) Waste Acceptance Procedures designed on the principles of risk elimination that prevent asbestos emissions from soil ever exceeding asbestos WHO air quality guidance levels
6) Asbestos Air Monitoring using both PCOM and SEM testing to ensure both low detection limit and instantaneous results are available using PCOM analysis to effectively manage any mitigation measures should this need ever arise. However, no emissions have ever been detected above the method detection limit at the operator's other facility and so has not resulted in the need for active mitigation.
7) Dust/Particulates management with continuous on site detection with permanent dust monitors and frisbee gauges.

One of the benefits from daily monitoring of airborne asbestos is the rapid turn-around time between monitoring and results, where results will be provided within one hour of the air sampling and the Operator can carry out the appropriate mitigation should there be a result detected above 10% of the 0.01f/ml emissions limit (i.e., 0.001f/ml).

If asbestos fibres are identified above 10% of this 0.01f/ml permit threshold, then the operation will cease immediately, and the cause of the breach investigated and rectified. Where appropriate working procedures will be amended/additional mitigation measures implemented. Monitoring will be repeated until this confirms no fibre release above 10% of the permit threshold (i.e., 0.001f/ml).

Bat 14a 'minimising the number of potential diffuse emission sources' we have proposed the following:

Waste Acceptance

The acceptance of asbestos containing loads requires control measures to minimise the risk of fibre emissions. Site operatives will be informed of which pre-arranged loads containing visible fragments of bonded asbestos as well as being informed of all other chemical analysis included within the producer's waste description.

All site operatives and machine operatives involved in the reception, handling and movement of asbestos containing waste will also be briefed.

Any material arriving to site contaminated with asbestos must be pre-arranged with adequate information on the waste description to ensure that the waste is appropriate for treatment. Incoming soils will be tested prior to formal acceptance to ensure this meets the permit asbestos emissions limit as specified in the waste acceptance procedures, including:

1) Full waste description of the waste including chemical analysis
2) Type of bonded ACM and fibre quantification using stage 2 and 3 testing as appropriate to ensure asbestos fibre levels do not exceed the chrysotile threshold of <0.1% or <0.01% threshold for amphibole forms of asbestos
3) Confirmation from the waste producer that any form of friable asbestos (e.g., asbestos insulation board, lagging) is not visually present in the soil

All asbestos containing wastes will enter the site and directed by the Operator to the reception area. Wastes contaminated with asbestos will be in a segregated, labelled, and designated area for asbestos and will be deposited in that clearly marked area identified as **'asbestos reception area'**.

As per the Waste Acceptance Procedures, all incoming tipper trucks are required to be sheeted on arrival at site. The sheeting minimises the risk of potential dust and fibre release. Pre-acceptance procedures ensure that only bonded asbestos that poses a nil, or low risk of fibre release is contained within the loads. At the beginning of each shift, the Operator will discuss with site team how many loads of asbestos containing soils have been booked in for deposit. This booking system implemented on the operator's other site ensures that there are always sufficient resources available for the receipt / inspection / sampling and stockpiling of material.

When loads are tipped into the designated asbestos reception area, they will be tipped from the lowest possible height to minimise emissions release. Any asbestos emissions from this activity is monitored downwind using asbestos sampling pumps. Visual inspection of the load on arrival will be undertaken by a trained and technically competent person. The load will be sampled, and stockpiles will be covered with tarpaulins whilst the reception soil analysis is completed.

A dust suppression system will be present and surround the reception area and can be used when required to continually dampen the stockpile during loading and unloading activities.

Pre-acceptance testing will be conducted to confirm the soil matrix and not containing any asbestos fibres above 0.1% for chrysotile asbestos and 0.01% for all other asbestos. If the initial chemical analysis results do not meet the waste acceptance criteria for the site, the waste will be rejected, and waste rejection procedures will be followed. Following the receipt of laboratory results from pre-acceptance testing that confirm that the asbestos concentrations are below their respective thresholds, the soil is then formally accepted and can then be processed into separate fractions for hand-picking. **The soils will always remain covered in a designated reception area, until it is required to be moved to the screener and picking station.**

Asbestos Air monitoring

This activity will be undertaken during all soil movement operations to ensure that all emissions are recorded and any need for mitigation is implemented immediately.

Boundary monitoring

Boundary monitoring will comprise a series of static air monitoring pumps located along the boundary down wind of the active working area. This will allow for a comprehensive assessment of the concentration of any airborne fibres which may be present at the site's boundary. The monitoring method utilised will achieve a detection limit of 0.0005f/ml. The potential for concentrations to exceed this low concentration is practically nil on the basis that this detection limit is never exceeded at the operator's other site from monitoring points adjacent to the asbestos processing inside a building.

Working area monitoring

To record asbestos concentrations in air during operations involving the movement, handling and processing of asbestos impacted soils, air monitoring using static pumps will be undertaken downwind in the immediate vicinity of the works. Daily monitoring will be conducted to ensure that emissions meet <0.01fm/l. The use of the <0.01f/ml detection limit is proposed due to this being the threshold described within the operator's other permit. This monitoring is undertaken using phase contrast optical microscopy (PCOM) and allows for the concentrations of airborne asbestos to be determined directly after the monitoring is complete. The method used is described in EA guidance document Technical Guidance Note M17, Ver 2, 2013 and HSE guidance HSG248 (May 2021).

If asbestos fibres are identified above 10% of the 0.01f/ml permit level (i.e., 0.001f/ml), then the operation will cease immediately, and the cause of the breach investigated and rectified. Where appropriate working procedures will be amended/additional mitigation measures implemented. Monitoring will be repeated until this confirms no fibre release above the permit threshold.

The detection limit can be reduced where required to <0.0005f/ml using either PCOM or Scanning Electron Microscopy (SEM). PCOM analysis is less effective for monitoring air to the <0.0005f/ml detection limit in the direct vicinity of mobile plant due to the presence of fine combustion particulates from mobile plant emission that can occlude slides. SEM is able to provide low detection limits as standard (<0.0005f/ml) and work in direct vicinity of mobile plant.

Locations of the working area monitoring points for asbestos and dust is shown on drawing ref: 3982-CAU-XX-XX-DR-V-1812.

Air testing immediately adjacent to the picking station will validate that that the control measures set out are minimising the risk of asbestos fibre release to an acceptable level. Boundary monitoring will provide a record that asbestos fibres are not being released >0.0005f/ml outside of the site boundary in any prevailing wind direction. Monitoring will be regularly reviewed during the day for exceedances above the threshold levels. There has never been an incidence of airborne asbestos exceeding the method detection limit on the operator's other site.

Whilst there are concerns from the Environment Agency over the release of fibres from soils that meet the acceptance criteria thresholds contained within this document; there is no evidence that this could ever occur. At no point since the operator commenced the treatment of asbestos contaminated soils in February 2018 has there been a need to implement suppression measures due to the presence of asbestos fibres above the method detection limit of either 0.0005f/ml or 0.01f/ml, and at no point has there been the potential to exceed the permit threshold of 0.01f/ml. All monitoring data is submitted and approved to the Environment Agency as a standard requirement of the permit on the operator's other site.

Under BAT 14d 'containment, collection and treatment of diffuse emissions' we have proposed the following:

Sheeting and enclosure: Storage of asbestos containing materials
Asbestos reception areas will be clearly delineated and segregated from other soils. The soils form a basis of the operator's soil treatment procedures that use a batch system.

Soils are characterised by using MCERTS approved methods at a UKAS accredited laboratory as part of the waste characterisation process. Visual inspections of soils with ACM inclusions are also undertaken on the majority of soil inputs by the operator prior to the soils being transported to the treatment site.

Upon reception of the soils, these are covered with tarpaulins to provide a physical barrier to emissions release whilst reception testing is undertaken to confirm that the soils meet the acceptance criteria for treatment. The applicants other site uses the same approach detailed here for external storage as well as uncovered stockpiles within a building. Asbestos monitoring undertaken over the complete operational period in reception areas at the operator's other site have confirmed that there are no diffuse asbestos emissions from the uncovered stockpiles of soil during unloading and movement of the soil. The approach detailed on this site however includes the provision of a tarpaulin to function as secondary containment in the form of a physical barrier preventing emissions.

Whilst there are concerns about diffuse asbestos emissions from the Environment Agency, there is no evidence to support this opinion. All monitoring undertaken on uncovered soils during the delivery by tipper lorries, the formation of stockpiles and subsequent treatment by hand picking have not resulted in airborne asbestos emissions above the method detection limit, irrespective of whether this detection limit is 0.01f/ml or 0.0005f/ml. All asbestos monitoring data that has been submitted and approved by the Environment Agency is included in Appendix A.

Segregated storage and processing area for asbestos containing soils
The Site Layout Plan (drawing ref: 3982-CAU-XX-XX-DR-V-1807) will be amended so that the asbestos storage and processing area is kept on a dedicated treatment pad. Bioremediation and Asbestos Treatment will operate on a batch basis and be undertaken on separate treatment pads with the enclosure of screening operations and conveyors as far as reasonably practical.

Enclosure of Asbestos Picking station and Screener
Screening Operations
A mechanical screener will be used to remove oversize material from asbestos containing materials. The screened material is then passed through the picking station to allow the removal of any bound asbestos debris. Soils will be screened using a three-way screener.

It is proposed to add a cover on the screening deck and conveyors of the soil screener and direct air to a HEPA filter to provide a physical barrier for emissions and provide a point source for monitoring air quality. The screener deck and conveyors will be enclosed and linked to a HEPA filter that will have a minimum of 8 air exchanges per hour (>64m^3/hr) within the volume of the screener decks/arms. The HEPA filter will be fixed to the screener which will be monitored to ensure that emissions meet the <0.01f/ml permit threshold. Where SEM testing is undertaken this will ensure that the asbestos concentrations in air are below 0.0005f/ml. This modification to the soil screener would act as secondary containment for any particulate emissions and meet the well established principle of reducing emissions to be as low as reasonably practicable (ALARP).

A schematic of the enclosure for the soil screener is shown below:

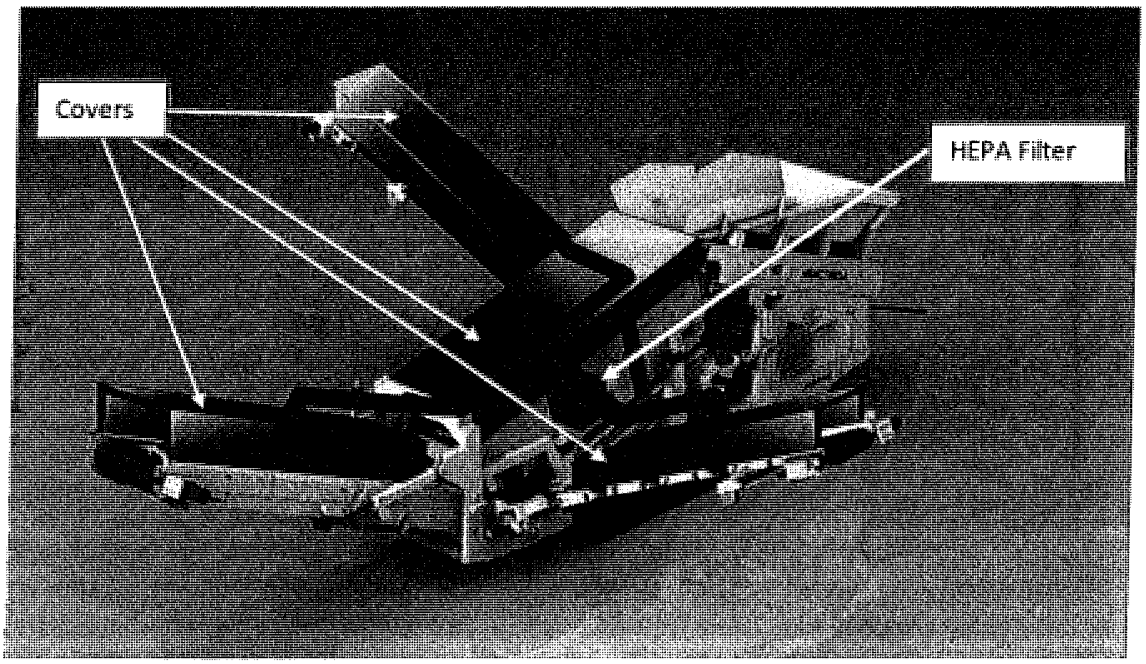

Figure 1. Enclosed Anaconda Three Way Screener

Daily monitoring will be undertaken to ensure that emissions meet <0.01f/ml. As secondary containment, continuous dust suppression in the form of misting systems is also provided around the screening operations to reduce the potential for any fugitive emission release. Materials moved from the screener to the picking station will be a continuous process where soils are directly fed from the screener to the picking station via a conveyor.

It is stated that the Environment Agency believe that asbestos fibres will be released during the screening of asbestos contaminated soils. This belief is not substantiated by airborne asbestos monitoring data on all sites where this operation is conducted. This is even the finding on projects that treat forms of asbestos such as unbound asbestos, an approach that would not be acceptable at the Daneshill site. This approach is regularly permitted by the Environment Agency and approved by the HSE in the UK for land remediation work. A recent pan European NICOLE (Network for Industrially Co-ordinated Sustainable Land Management in Europe) document references several UK permitted projects where screening of asbestos contaminated soils in the open air prior to hand picking has been undertaken. This document is provided in full in Appendix B.

Asbestos Picking Station

The asbestos picking station will be a mobile enclosed unit and will be identical to the type approved for use under an environmental permit at the operator's other site.

Airborne asbestos concentrations have been monitored both within, and directly adjacent to the picking station at the operator's other site. There is no increase in asbestos concentrations above the method detection limit of either 0.01f/ml or 0.0005f/ml within the internal atmosphere of the picking station, nor ambient air immediately outside of the picking station. This monitoring has been undertaken since the operator commenced the treatment of bound ACM contaminated soils. All air monitoring data has been submitted to the Environment Agency and approved as being compliant with the permit. This is enclosed in Appendix A.

Notwithstanding the evidence that there are no elevated airborne asbestos emissions within the picking station, there will be a series of spray rails on the incoming and outgoing conveyor to effectively capture and contain particulate emissions. This would act as secondary containment for

any particulate emissions and meet the well established principle of reducing emissions to be as low as reasonably practicable (ALARP).

The out-going conveyor will drop the hand-picked picked processed soils, the drop height will be minimised to reduce any agitation of the soils. A dust suppression system will be in place as per drawing ref: 3982-CAU-XX-XX-DR-V-1811 identical to the approve suppression system on the operator's other site that can be used to continually dampen stockpiles during loading and unloading activities.

The process in the picking station will involve a manual sorting process by trained operatives who will remove visible fragments of asbestos from the materials from the conveyor. Asbestos picked from the conveyor will be placed by hand in individual polythene bags located inside the picking station beside the trained operatives. When the bags are either full, of the end of the working day is achieved, the polyethylene bag will be placed into a second bag and sealed using a taped swan neck. The double bagged asbestos will be taken outside and placed by hand into the on-site enclosed lockable asbestos skip. Used PPE from the picking station and direct working areas will be double bagged using the same approach as ACM debris and placed into the enclosed lockable asbestos skip.

A Category B trained supervisor will regularly check the labelled, lockable asbestos waste skip and will arrange for the collection and delivery of news asbestos skip when the existing skip has reached 75% capacity. This is to ensure that there is no risk of the skip becoming over capacity and unable to accept further bagged asbestos. This will form part of the daily site checks.

Storage of handpicked asbestos soils (post- treatment)

The out-going conveyor from the asbestos picking station will deposit the hand processed soils into a separate stockpile labelled as treated soils. The stockpile within this designated area will then undergo further visual inspection by the suitably trained/qualified member of staff for any asbestos containing fragments. If any asbestos fragments are encountered, the materials will be re-loaded into the asbestos picking station and processed until no visible asbestos fragments are observed through visual inspection.

The materials will undergo 'Post Treatment Verification Sampling' (See Section 2.7 of 'Treatment Process & Indicative BAT review' document ref: 3982-CAU-XX-XX-RP-V-0303) testing and sampling will confirm that treated soils meet the restoration soil quality targets* to enable their use in the restoration area of Daneshill Landfill Site. If, after the receipt of laboratory analysis results the soils do not meet the acceptance criteria will either be treated further or removed from site to an alternative disposal facility.

Storage of the treated soils has been undertaken on the Operator's other site prior to reuse as it is not always possible to use directly after treatment due to inclement weather, or ground conditions on the restoration area. Asbestos monitoring of these treated stockpiles has demonstrated that the airborne asbestos levels are not above the method detection limit at any point during post treatment storage. There is no evidence that the storage of treated soils can result in emissions of asbestos fibres above the detection limit irrespective whether it is 0.01f/ml or 0.0005f/ml.

*the restoration criteria will be developed prior to the reuse of any treated soils. This will comprise of a detailed quantitative risk assessment to derive criteria for the protection of human health, controlled waters, and the use where appropriate of generic criteria for the protection of ecological receptors.

Bat 14e Dampening

Dampening and dust suppression will be conducted around the asbestos storage and processing areas – Drawing 3982-CAU-XX-XX-DR-V-1810 details the locations of the high flow rate dust suppression system and the bowser dust suppression systems. The suppression system that will be used at Daneshill Soil Treatment facility will provide a fully encompassed suppression system with overlapping arcs between misting units which has been designed to contain any potential emissions and provided suppression for the activities carried out on site.

a) Dampening and suppression on stockpiles and around processing area

b) Spray line on the asbestos picking station feed conveyors

c) provision on site of a water bowser equipped with a misting suppression system and adequate year-round water supply;

d) use of uncontaminated water for dust suppression, to avoid re-circulating fine material;

e) high standards of housekeeping to minimise track-out and windblown dust/fibres;

f) Dampening and sheeting of asbestos containing material stockpiles: designated reception area and separate designated post-treatment storage area

In addition, the following documents are in place:

- Emissions Management Plan in place, document ref: 3982-CAU-XX-XX-RP-V-0307
- Air Quality Impact Assessment' The Air Shed (March 2020), document ref: A 0732

Summary

- The operator has submitted a robust approach that prevents the release of asbestos fibres.
- The conservative management proposals detailed herein are validated as meeting the permit limit of <0.01f/ml for asbestos fibres at all times with mitigation being implemented if 10% of this limit is observed, however this has never occurred on the applicant's other operational site.
- The approach also meets a more restrictive and lower asbestos limit of <0.0005f/ml detailed in WHO guidance for air quality[1].
- There are no quantifiable emissions of asbestos from the process detailed herein, irrespective of the containment and suppression measures implemented, this is due to the risk elimination target as a core principle of the waste acceptance criteria for incoming soils
- In addition to this, containment and suppression measures are proposed as secondary measures for additional reassurance to the regulator and general public
- The soil screener is enclosed and has a HEPA filter to allow point source emissions to be monitored in addition to the continuous daily asbestos monitoring undertaken in the general working areas
- It is inconceivable with the measures highlighted that there could ever be a release of asbestos fibres above the detection limits stated
- The approach meets the core principles of BAT

Appendices

Appendix A – Asbestos Monitoring Data Submitted to the EA and Approved under the Permit on the Applicants Other Site

[1] WHO Air quality guidelines for Europe. 2nd Edition, 2000.

Appendix B – Asbestos in Soil, a Pan European Perspective. NICOLE, 2021.

APPENDIX A – ASBESTOS MONITORING DATA

APPENDIX B – ASBESTOS IN SOILS, A PAN EUROPEAN PERSPECTIVE, NICOLE 2021