

## 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 combination 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 provide 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 <0.01f/ml. 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.

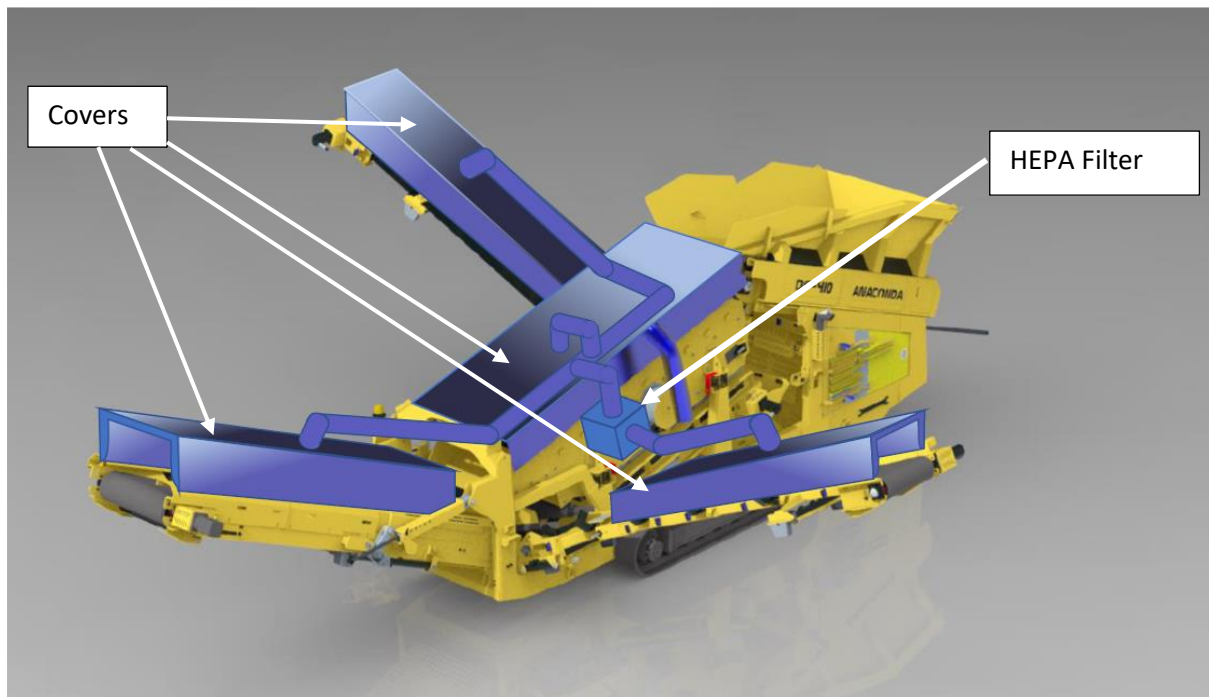
### **Enclosure of Asbestos Picking station and Screener**

#### 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 ( $>64\text{m}^3/\text{hr}$ ) 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  $<0.01\text{f/ml}$  permit threshold. Where SEM testing is undertaken this will ensure that the asbestos concentrations in air are below  $0.0005\text{f/ml}$ . 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 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 approved 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, or 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 new 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 <math>0.01\text{f/ml}</math> 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 <math>0.0005\text{f/ml}</math> detailed in WHO guidance for air quality<sup>1</sup>.
- 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

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<sup>1</sup> WHO Air quality guidelines for Europe. 2<sup>nd</sup> Edition, 2000.

## **Appendices**

Appendix A – Asbestos Monitoring Data Submitted to the EA and Approved under the Permit on the Applicants Other Site

<https://www.dropbox.com/s/mjkrhrr3ow28l22/Asbestos%20Data.zip?dl=0>

Appendix B – Attached in email