Brookhurst Wood - Open Windrow Compost Facility

Environmental Permit Variation EPR/AB3700LS/V006
Dust Emission Management Plan for the ATRF and OWC

Biffa Waste Services Ltd

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Quality information

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1. Report Context

1.1 Introduction

AECOM has been commissioned by Biffa Waste Services Limited ("the Operator" or Biffa) to prepare an application to develop a new Open Windrow Composting Facility (OWC) at Brookhurst Wood, Warnham, West Sussex. Given the locality of the new development on site, the new OWC will be added as an additional operation to the environmental permit (EPR/AB3700LS) for the Aggregate Treatment and Recycling Facility.

The new OWC facility is being developed to treat up to 60,000 tonnes per annum of green waste and 30,000 tonnes per annum of wood waste. .This document is the Dust Emission Management Plan (DEMP) which has been prepared to support the permit application for the new OWC process. The report should be read in conjunction with other supporting application information.

1.2 Proposed Facility

There are no changes proposed to the existing Aggregate Treatment and Recycling Facility (ATRF) operations although a new crushing operation will be included, and some additional waste codes will be added to the permitted waste list including mixtures of waste from the mechanical treatment of wastes that contain a high proportion of recoverable aggregate.

The proposed facility will comprise new plant to facilitate the receipt, shredding and subsequent composting of green waste and shredding of wood waste. Waste types accepted at the facility will be defined according to their List of Waste (LoW) Code and will generally consist of:

- wood waste;
- green waste;
- leaves;
- grass clippings; and
- horticulture type waste.

The facility will not receive or accept any waste covered by the Animal By-Product (Enforcement) (England) Regulations 2013 (ABPR).

The new plant will be designed to effectively shred the constituent parts of the incoming green waste, which is then transferred to open air windrows for composting and maturation. Green waste will be treated through the composting process while wood waste will only be shredded.

The intention is to produce a PAS 100 compliant compost from the inputs and as such it will be deemed to have reached end of waste criteria and is therefore no longer subject to waste regulatory controls as it has achieved product status. The product can be utilised for a wide range of beneficial after-uses including landfill restoration, community projects within West Sussex, domestic use and for agriculture.

2. Background

2.1 Scope

This dust emissions management plan (DEMP) has been developed in accordance with the Environment Agency's (EA):

a. Dust & Particulate Emission Management Plan Template (2018); and

b. Environmental permitting guidance '*Control and Monitor emissions for your environmental permit*' (updated 24 November 2022) .

The guidance states that all DEMPs should as a minimum contain the following elements:

- The plan version number and date;
- An introduction to the site and description of site operations;
- Details of local sensitive receptors, other local contributors of dust and emissions;
- Emission sources on site;
- Site abatement systems including the nomination of responsibility
- Suitable monitoring;
- Actions, contingencies and responsibilities when problems arise; and
- How you contact the local community and respond to complaints.

The DEMP must also show how the principle of source, pathway, receptor model has been taken into consideration the planning of site, operations and abatement to minimise emissions including how different weather conditions may affect these activities.

This dust emissions management plan (DEMP) has been prepared to only address the management of potential dust emissions from the site processes in order to minimise the risk of pollution. A separate management plan has been prepared for Odour Management at the site.

The DEMP will specifically consider:

- Section 3 – The site setting,
- Section 4 – Assessment of pollution risk;
- Sections 5 and 6 – Proposed management control and arrangements including triggers for management actions; and
- Sections 7 and 8 – Monitoring, recording and reporting arrangements.

3. Overview of Process and Location

3.1 Existing ATRF Process

The existing ATRF facility is situated on existing hardstanding and treats up to 60,000tpa of street cleansing and similar residues to produce a range of outputs including:

- Aggregate materials;
- Metals;
- Organic materials; and
- Silts.

The ATRF includes:

- Waste reception bays for the receipt of incoming street cleansing residues;
- A recycling plant, comprising a feed system, washing plant, silt removal, dewatering, primary stage water treatment and a filter press;
- Storage bays for product outputs including sand, aggregates, organic and silt materials; and
- Waste storage skips for recovered metals.

A crushing operation will be mobilised on a campaign basis for the crushing of oversize fractions from the ATRF processes and foe processing some specific waste streams that do not require treatment by washing.

Vehicles use the weighbridge and gatehouse at the adjacent landfill site, and operators will use the landfill site office/welfare facilities and mobile plant refuelling station.

The site is designed with in-built safety systems to ensure that risks associated with:

- on-site traffic movements and tipping are minimised;
- dust associated with handling of waste is minimised and controlled; and
- noise is controlled and minimised.

3.2 Proposed Open Windrow Composting Process

The OWC facility will accept and treat up to 60,000 tpa of green waste to produce a PAS 100 compliant compost through maturation of the waste in open windrows. In addition, the facility will accept up to 30,000 tpa of wood waste which will be processed by shredding.

The OWC facility will comprise mobile and fixed plant located on a concrete pad with storage bays for incoming material and product, and windrows of green waste material being processed. The OWC facility will be supported with a new surface water drainage and collection system.

The components of the OWC plant include:

- incoming waste reception area which has storage capacity for green and wood waste within designated storage bays;
- high speed tracked shredder that will be used to shred waste. When being used for green waste, the shredder will travel across the treatment pad to directly forms rows of windrows;
- Mobile plant will be used to facilitate the loading and unloading of incoming/outgoing materials as well as facilitating the mechanical turning of windrows during maturation stages;
- a new screening and separation building that will include static plant to facilitate the screening of incoming waste to remove potential contaminants and final product screening to achieve the relevant size fraction of different products.
- output storage area comprising storage bays for the finished;

- A perimeter drainage system, comprising drainage channels, two surface water storage lagoons with pumps, a settlement lagoon and dual water storage tanks – water will be used as irrigation water for the windrows.
- new weighbridges and associated office. Employees will continue to use the welfare facilities at the existing landfill office.

3.3 Acceptance of Waste

3.3.1 Hours of Acceptance

Waste will be accepted in accordance with the site Planning Permission as detailed in Table 1 below.

Table 1 Hours of Waste Acceptance

Day of the week	Opening Hours
Monday to Saturday:	07:00 to 18:00
Sunday:	Closed for deliveries
Public Holidays:	07:00 to 10:00

3.3.2 ATRF – Accepted Waste Types

The current waste types accepted are street cleansing residues and similar aggregates which fall under the EWC codes shown in Environmental Permit EPR/AB3700LS (Ref Schedule 2, Table S2.1 Environmental Permit EPR/AB3700LS). Additional waste codes will be added to the permitted waste list including mixtures of waste from the mechanical treatment of wastes that contain a high proportion of recoverable aggregate.

Plant intake capacity is expected to be up to 60,000 tpa and acceptance will be dependent on characteristics of the incoming waste streams.

3.3.3 OWC- Accepted Waste Types

Waste types proposed to be accepted at the OWC facility will be defined according to the relevant LoW Code, which will be shown in Environmental Permit EPR/AB3700LS (Ref Schedule 2, Table S2.2). The site will have a capacity up to 90,000tpa but will generally consist of:

- Wood waste
- green waste;
- leaves;
- grass clippings; and
- horticulture type waste.

.It should be noted that wood waste will not be processed or treated via the windrows.

3.4 Mobile Plant

The following table lists the type of typical mobile plant and equipment used on site plus the emission ratings:

Table 2 Site Mobile Plant

Description	Make	Model	Emission Rating
High speed tracked shredder (Terex TBG630)	e.g., Terex	e.g., TBG630	Tier 4
Loading Shovel * 4	e.g., Caterpillar	TBC	Tier 3
Crusher, on campaign basis	e.g., Powerscreen	e.g., Metrotrack	Tier 3
21T Dump Truck * 2	e.g., Volvo	TBC	Tier 3
Excavator * 2	e.g., Volvo	TBC	Tier 3

All such plant is subject to planned preventative maintenance in accordance with the manufacturer's recommendations. In the event that such plant needs to be replaced, then selection of the replacement plant will include consideration of the vehicle emissions standards.

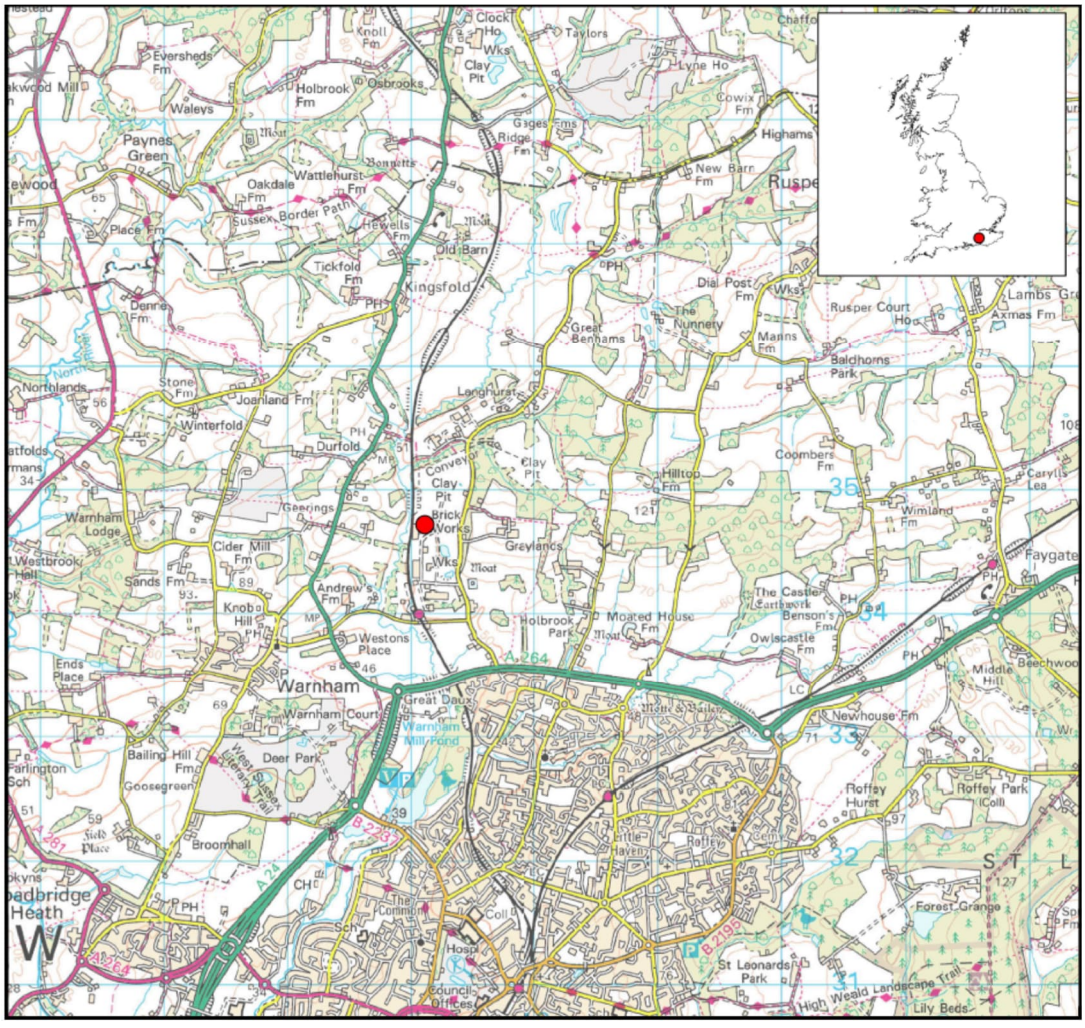
3.5 Site Location

The OWC facility will be operated on a l-shaped area which is to be situated adjacent to the south and east of the existing ATRF operated by Biffa, within the Brookhurst Wood Landfill Site. The Brookhurst Wood site is located approximately 4km to the north from the centre of Horsham. The village of Warnham is 1.5 km to the south-west of the site and Kingsfold is 2km to the north.

The centre of the extended ATRF is located at grid reference National Grid Reference (NGR) E517105, N134659 at Brookhurst Wood, Langhurstwood, Horsham, West Sussex.

Figure 1 shows the location of the treatment and recycling site:

Figure 1 Site Location Plan



The setting is regarded as predominantly rural. In the immediate neighbourhood, there are a scattering of farmhouses and other isolated dwellings to the west of the site.

To the east there is a former residential property, known as 'Greylands' which has been converted for office use. To the north there is the Broadlands Business Park, which accommodates 11,000 square metres of office development.

To the south are older buildings from the original Warnham Brickworks and the Warnham railway station. The main Dorking to Horsham railway line runs along the western border of the landfill site and the vehicular entrance to the landfill is by the Langhurstwood Road to the east.

Residential communities within 2km of the site include Horsham, Warnham, Kingsfold and Holbrook. These are found to the south, west, north and east respectively. Horsham is the largest community in the Horsham District, with a population of approximately 45,750.

There is a scattering of farmhouses and other isolated dwellings to the north, east and west of the site. These include Greylands Lodge and Greylands Farm to the east of the site boundary, Cox Farm and Andrew's Farm to the west and Gunbarn/The Nowhere Houses to the northwest. A further dwelling 'Bramblehurst' abuts the site to the southeast, adjacent to the site access from Langhurstwood Road. A small row of dwellings lies to the south of this.

There are eight residential properties on the western side of Langhurstwood Road between its junction with the A246 and the site entrance and a recent converted farm building residential development on the eastern side of Langhurstwood Road.

3.6 Other Local Contributors of Potential Dust Emissions

Other potential sources of dust generation within the locality of the site include the adjacent landfill, Britannia Crest Waste Transfer Station and brickworks. The location of these sources is shown on Drawing BA236000 Sensitive Dust Receptors and Other Dust Sources which is attached in Appendix A.

4. Assessment of Pollution Risk

4.1 Introduction

This section outlines the approach taken to evaluate the dust risks associated with the operation of the existing ATRF and proposed OWC processes. The impact evaluation process has referred to the appropriate guidance within:

- Environment Agency Guidance "Control and monitor emissions for your environmental permit";
- IAQM "Guidance on the Assessment of Mineral Dust Impacts for Planning"; and
- IAQM "Guidance on the Assessment of Dust from Demolition and Construction"

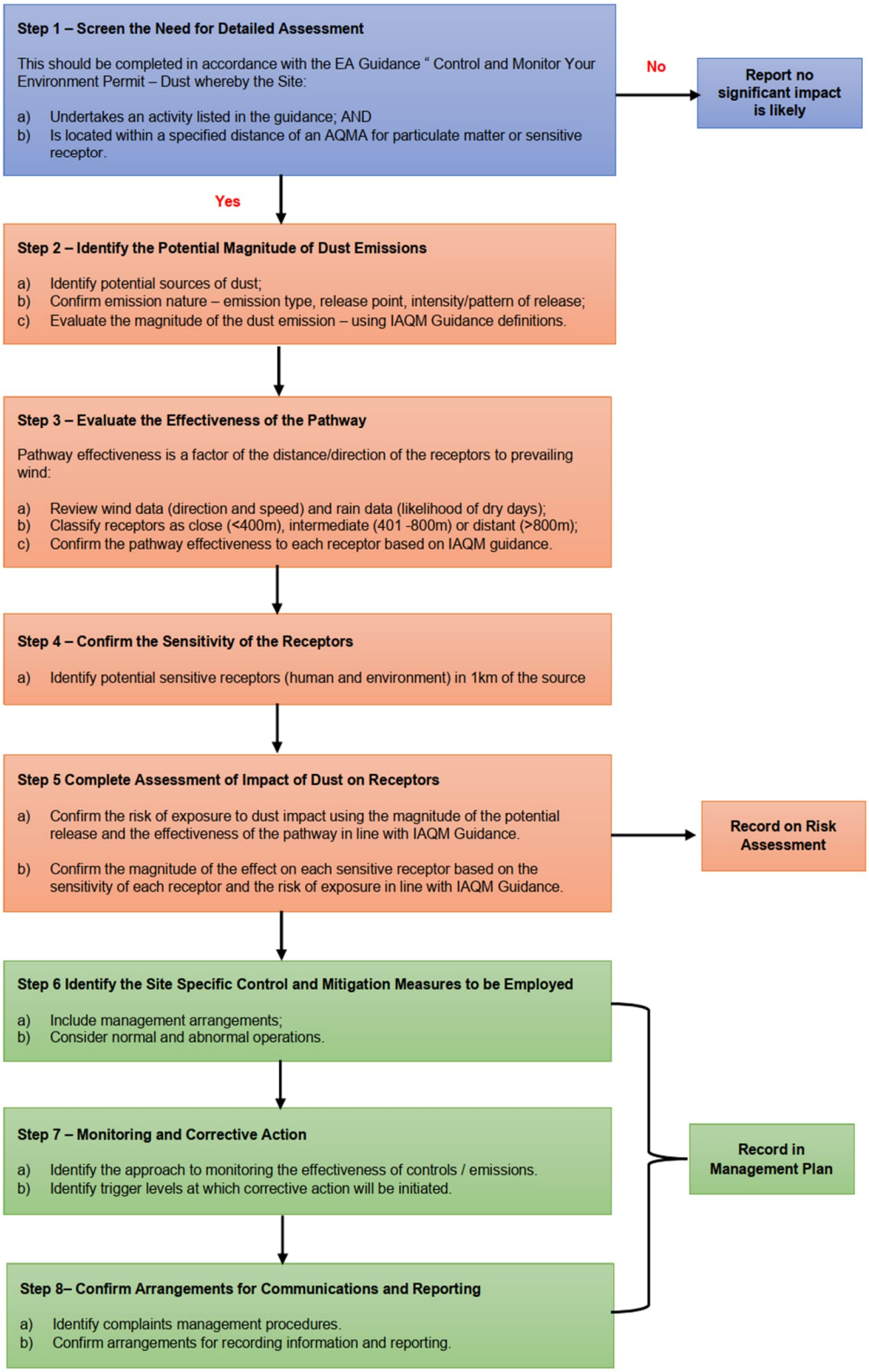
4.2 Risk Assessment Methodology

In respect of this DEMP Risk Assessment the source-pathway-receptor model has been used as shown in the flowchart on the following page. The risk assessment follows relevant guidance as detailed above and includes:

1. Source characterisation (section 4.3 below) has been completed to identify the potential dust hazards and risks associated with the operation of the treatment and recycling plant;
2. Pathway evaluation (section 4.4 below) has been completed giving due consideration to the distance and direction of the receptors relative to the prevailing wind direction and days when rain fell at levels sufficient to suppress dust. The site is relatively flat with no bunds on the boundary although existing vegetation on the boundary will be retained where possible; and
3. Receptor evaluation (section 4.5 below) to review the sensitivity of receptors that could be impacted by the dust hazards and risks from the operation of the treatment and recycling plant. This covers residential, commercial and industrial human receptors.

The risk assessment conclusion is then presented at section 4.6 below.

A risk and mitigation matrix that evaluates the individual dust hazards and risks in terms of the probability of occurrence and the severity of the impact on the identified receptors without implementation controls and mitigations is tabulated and presented in Appendix B. This matrix goes on to summarise the dust management plan approach that will be used to mitigate the identified risks.


Step 1 – Screen the Need for Detailed Assessment
This should be completed in accordance with the EA Guidance " Control and Monitor Your Environment Permit – Dust whereby the Site:
a) Undertakes an activity listed in the guidance; AND
b) Is located within a specified distance of an AQMA for particulate matter or sensitive receptor.
No
Report no significant impact is likely
Yes
Step 2 – Identify the Potential Magnitude of Dust Emissions
a) Identify potential sources of dust;
b) Confirm emission nature – emission type, release point, intensity/pattern of release;
c) Evaluate the magnitude of the dust emission – using IAQM Guidance definitions.
Step 3 – Evaluate the Effectiveness of the Pathway
Pathway effectiveness is a factor of the distance/direction of the receptors to prevailing wind:
a) Review wind data (direction and speed) and rain data (likelihood of dry days);
b) Classify receptors as close (<400m), intermediate (401 -800m) or distant (>800m);
c) Confirm the pathway effectiveness to each receptor based on IAQM guidance.
Step 4 – Confirm the Sensitivity of the Receptors
a) Identify potential sensitive receptors (human and environment) in 1km of the source
Step 5 Complete Assessment of Impact of Dust on Receptors
a) Confirm the risk of exposure to dust impact using the magnitude of the potential release and the effectiveness of the pathway in line with IAQM Guidance.
b) Confirm the magnitude of the effect on each sensitive receptor based on the sensitivity of each receptor and the risk of exposure in line with IAQM Guidance.
Record on Risk Assessment
Step 6 Identify the Site Specific Control and Mitigation Measures to be Employed
a) Include management arrangements;
b) Consider normal and abnormal operations.
Step 7 – Monitoring and Corrective Action
a) Identify the approach to monitoring the effectiveness of controls / emissions.
b) Identify trigger levels at which corrective action will be initiated.
Record in Management Plan
Step 8– Confirm Arrangements for Communications and Reporting
a) Identify complaints management procedures.
b) Confirm arrangements for recording information and reporting.

4.3 Source Characterisation

4.3.1 Hazard Identification

The hazard identification process draws on AECOM's knowledge of dust impact assessment on similar plants and applications.

4.3.2 Emission Sources

Activities associated with the facility operations with the potential to generate dust, can be divided into the following operations:

- Receipt of wastes either for processing through the ATRF or OWC;
- Waste discharge;
- Waste placement in windrows for the OWC;
- Waste processing through the ATRF or OWC;
- Shredding at the OWC;
- Crushing at the ATRF;
- Roads and onsite vehicle movements;
- Storage of incoming waste and output materials; and
- Materials (waste and aggregate) handling activities.

These activities are reviewed further in Table 3 below where the dust risk from each source is categorised as small, medium or large in accordance with the IAQM guidance.

Table 3 Categorisation of Source Magnitude

Magnitude of Source	Description
Large	Source of release covers a large area (>10,000 m2). Dusty soil/material type. More than 10 items of mobile plant active at any one time. Formation of stockpiles >8m in height. >50 HGV vehicles delivering/collecting from site per day.
Medium	Source of release covers a moderate area (2,500 to 10,000 m2). Moderately dusty soil/material type. 5 to10 items of mobile plant active at any one time. Formation of stockpiles 4 - 8m in height. 10 - 50 HGV vehicles delivering/collecting from site per day.
Small	Source of release covers a large area (<2,500 m2). Soil/material type with large grain size. Less than 5 items of mobile plant active at any one time. Formation of stockpiles <4m in height. <10 HGV vehicles delivering/collecting from site per day.

Taking the above into consideration, we have concluded that the dust source potential for both the ATRF and the OWC would be medium on the basis that:

- While magnitude in terms of source area (sqm) would be high the range of potential contaminants and levels present would be variable and potentially range from low to medium magnitude;
- Materials handled may be moderately dusty dependant on ambient conditions; and
- Based on experience on other facilities internationally the proposed mitigation measures would be effective leading to little or no residual dust.

A detailed site plan showing site layout including site surfaces, location of storage area and processing areas, location of wheel wash arrangements and visual monitoring points is provided in Appendix A.

Table 4 Emission Sources

Source Description			Likely Pollutant	Containment/Release Point	Intensity at or Near Release Point	Pattern of Release	Potential to Impact Local Receptors
Source	Type of Emission	Dust Risk					
Receipt of Wastes – ATRF and OWC	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	The material to be treated will be offloaded directly to the treatment area on arrival to site Waste to be treated by the ATRF or composting process will be discharged to the relevant storage bays. Vehicles will be closed or covered when laden to limit dust emissions on highways and to surrounding environment.	Any emission likely to occur will be at low level and be contained within the ATRF / OWC area.	Low level of release contained within the ATRF / OWC area.	Unlikely as any release should be contained within covered vehicles until the point of tipping. Waste reception area will comprise storage bays with concrete block.
Movement of waste into the input hopper of the ATRF	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Material will be emptied into the hopper via a loading shovel.	Dust emissions will potentially occur at the entry point to the hopper although as the materials being treated are street cleansing residues, they will generally be wet thus minimising any dust potential.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is very low potential for fugitive release to carry to receptors as incoming waste streams have a higher moisture level.
Vibrating screen at ATRF	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Material fed into the hopper will fall onto vibratory screens	Dust emissions will potentially occur under and on the edges of the screen.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is very low potential for fugitive release to carry to receptors as incoming waste streams have a higher moisture level.
Waste Processing through the ATRF	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Dust may cause fugitive emissions due to drop heights and the mechanical movement of materials through the process.	During dry conditions dust emissions may be noticeable above drop points at the end of conveyors	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is potential for fugitive release to carry to receptors. Materials being handled in the ATRF have generally a high moisture level.
Crushing at the ATRF	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Material being processed through the crushing plant.	Dust emissions will potentially occur at the entry point to the crusher although the crusher will be equipped with integral dust suppression.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is very low potential for fugitive release to carry to receptors crusher equipped with integral dust suppression.
Screening and separation at the OWC	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Material will pass to vibratory screens and/or trommel	Dust emissions will potentially occur under and on the edges of the screens. Screening and separation plant situated in screening and separation building.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is very low potential for fugitive release to carry to receptors as screening and separation takes place inside a building.
Shredding at the OWC	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Wood and green waste will be shredded into storage bay or directly to windrow respectively.	Dust emissions will potentially occur at the entry point to the shredder although the shredder will be equipped with integral dust suppression.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is very low potential for fugitive release to carry to receptors as shredder is equipped with integral dust suppression.
Stabilisation and maturation in open air windrows at the OWC.	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Shredded material will be formed into windrows which will be turned approximately every two weeks.	During dry conditions dust emissions may be noticeable at surface of the windrows.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is potential for fugitive release to carry to receptors. Potential is low as windrows are conditioned to maintain required moisture levels.
Roads and onsite vehicle movements	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Haulage vehicles entering the site when laden should be sheeted to limit dust emission on highways and to surrounding environment. Vehicles with limited or partial load coverage may cause additional particulate release when driving at speed. Vehicles using unsurfaced /poorly maintained haul routes or driving at speed can cause soil particles to become airborne giving rise to nuisance. Vehicle emissions can contain particulate matter	During dry conditions dust emissions may be noticeable above at ground level along the transport route.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is potential for fugitive release to carry to receptors. The site will interrupt the pathway by utilising road sweeper to maintain site housekeeping, haulage vehicles will be sheeted, a 10-mph speed limit will be enforced.
Storage of waste, and soil/aggregate outputs – (designated storage area, oversized material stockpiles and storage bays);	Fugitive	Medium	Total Suspended Particulates and potential for respirable fraction	Waste processed at the ATRF and OWC likely to cause dust will be stored within designated storage bays.	During dry conditions dust emissions may be noticeable at face of external material stockpiles.	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is potential for fugitive release to carry to receptors. To minimise releases, incoming and processed wastes will be stored in bays constructed from concrete block walls and material will be kept below the height of the bay wall. Aggregates at the ATRF will be

Source Description			Likely Pollutant	Containment/Release Point	Intensity at or Near Release Point	Pattern of Release	Potential to Impact Local Receptors
Source	Type of Emission	Dust Risk					
							stored in stockpiles which will be positioned to minimize wind whipping.
Material movement including loading, unloading and transfer via conveyors.	Fugitive	Low	Total Suspended Particulates and potential for respirable fraction	Material movement at the ATRF and OWC is primarily via conveyors and loading shovels.	During dry conditions dust emissions may be noticeable above materials drop points (e.g., end of conveyors and/or at discharge points from mobile plant).	Release only expected in very dry conditions and then is likely to settle quickly close to source.	In windy conditions there is potential for fugitive release to carry to receptors.

4.4 Evaluation of Pathway Effectiveness

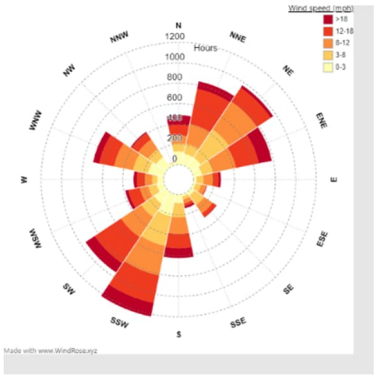
Pathway effectiveness is a function of the receptor distance from the source (i.e., how far will dust have to travel) and the prevailing weather conditions (i.e., frequency the receptor is downwind of the site, wind speed and presence of rain will determine how far particulate matter will be distributed).

4.4.1 Meteorological Conditions

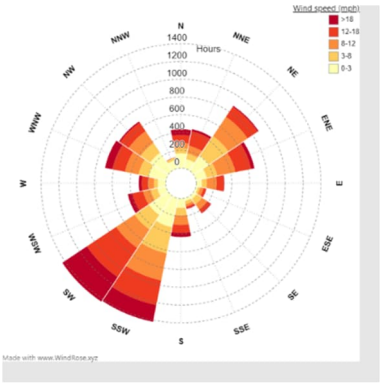
Research1[1] has shown that winds greater than 3m/s (6.9mph) are capable of suspending and carrying dusts. Windrose diagrams for 2018 to 2022 inclusive from the site meteorological system are provided for the site. All years show similar patterns with the predominant wind pattern of winds coming from the southwest and heading northeast. This wind direction also shows the strongest wind speeds recorded over the 5 year period. Wind from the northeast and southeast occur relatively infrequently (<5% of the time).

Figure 2 Windrose

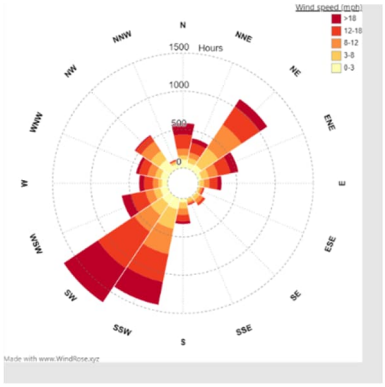
2018



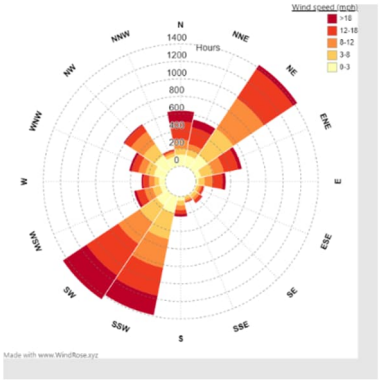
2019



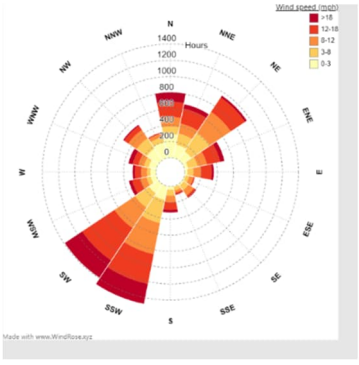
2020



2021



2022



[1] *K. W. Nicholson (1988) A review of particle re-suspension. Atmospheric Environment Volume 22, Issue 12, 1988, Pages 639-2651*

The frequency of wind in each direction was determined based on the five-year average meteorological data along with the frequency of the wind speeds in those directions. These are presented in Table 5 below.

Table 5 Percentage Frequency of Wind Direction

Direction Wind From	% Time Wind in Each Direction	Calm 0 – 0.45 m/s	Light 0.45 – 3.9 m/s	Gentle 3.9 – 5.5 m/s	Moderate 5.5 – 8 m/s	Fresh 8 – 10.8 m/s	Strong 10.8 – 13.9 m/s	Near Gale 13.9- 17.2 m/s	Gale > 17.2 m/s
N	7.83%	1.82%	1.98%	1.30%	1.25%	1.03%	0.34%	0.07%	0.04%
NNE	6.58%	0.53%	1.76%	1.66%	1.77%	0.74%	0.11%	0.02%	0.00%
NE	12.12%	0.75%	4.22%	4.60%	1.85%	0.56%	0.13%	0.02%	0.00%
ENE	6.89%	0.47%	1.69%	2.18%	1.52%	0.86%	0.15%	0.01%	0.00%
E	3.59%	0.21%	0.91%	1.25%	0.81%	0.36%	0.04%	0.00%	0.00%
ESE	1.29%	0.09%	0.51%	0.50%	0.16%	0.03%	0.00%	0.00%	0.00%
SE	2.35%	0.18%	0.93%	0.87%	0.30%	0.07%	0.00%	0.00%	0.00%
SSE	1.26%	0.14%	0.48%	0.38%	0.16%	0.09%	0.00%	0.00%	0.00%
S	4.43%	0.40%	1.36%	1.33%	0.72%	0.50%	0.11%	0.02%	0.00%
SSW	15.69%	1.13%	4.49%	4.59%	2.65%	1.86%	0.76%	0.17%	0.03%
SW	15.62%	0.92%	3.07%	3.86%	3.65%	2.81%	0.94%	0.28%	0.09%
WSW	4.88%	0.38%	1.43%	1.32%	1.01%	0.60%	0.12%	0.02%	0.01%
W	3.48%	0.31%	1.08%	0.93%	0.69%	0.36%	0.09%	0.02%	0.00%
WNW	5.89%	0.55%	2.11%	1.66%	0.87%	0.47%	0.17%	0.04%	0.01%
NW	6.30%	0.67%	2.86%	1.91%	0.65%	0.19%	0.02%	0.00%	0.00%
NNW	1.79%	0.23%	1.26%	0.23%	0.07%	0.01%	0.00%	0.00%	0.00%

In addition to wind, consideration has to be given to rain as rainfall is a natural dust suppressant. Research[2] has indicated that rainfall of greater than 0.2mm per day is considered sufficient to effectively suppress wind-blown dust emissions. The data presented in Table 6 presents average rainfall data for the area (based on 2018-2022 Rainfall Data for the Catchment Area from a site based weather station) and indicates that typically in any month there may be approximately 20 days in which dust control measures may need to be applied in the absence of sufficient rainfall to control fugitive dust emissions. This highlights the need for monitoring of weather forecasts in order to be proactive in the application of dust control measures.

Table 6 Average Monthly Rainfall

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	82.4	103.9	87.8	43.1	55.5	82.4	64.3	79.0	96.0	172.5	135.4	153.4
Days of rainfall >1mm	12	11	10	6	7	5	6	8	7	14	10	17

As the direction and speed of wind along with the presence of rain can affect how far dust may be carried from the site these have been used to evaluate the effectiveness of the pathway in section 4.4.2 below.

4.4.2 Effectiveness of the Pathway

Applying the methodology outlined in the IAQM Guidance on the Assessment of Mineral Dust Impacts (2016), site specific meteorological conditions and individual receptor distances were used to evaluate

[2] *Leeds University. Good Quarry.* http://www.goodquarry.com/article.aspx?id=55&navid=2

the effectiveness of the individual pathways. The site is reasonably flat, and no additional bunds or planting is proposed on site boundary that may impact dispersion of dust.

The frequencies from Table 5 above of moderate to high wind speeds that have the potential to carry airborne dust on a dry day were assigned to a frequency category and then taking into consideration with the distance of each receptor from the site, the effectiveness of the pathway for each individual receptor was determined.

The frequency categorisation of winds carrying dust was determined using the IAQM categories as summarised in Table 7 below.

Table 7 Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds > 5 m/s from the direction of dust source is < 5% on dry days
Moderately Frequent	Frequency of winds > 5 m/s from the direction of dust source is between 5% and 12 % on dry days
Frequent	Frequency of winds > 5 m/s from the direction of dust source is between 12% and 20% on dry days
Very Frequent	Frequency of winds > 5 m/s from the direction of dust source is >20% on dry days

Based on the data in Table 5 above, winds from the SW and SSW at speeds which dust can be carried from the site would occur moderately frequently. Wind from all other directions at speeds which dust can be carried from the site would occur infrequently.

In relation to the categorisation of the receptor distance from the dust source, was completed on the following basis:

Table 8 Categorisation of Receptor Distance from Source

Distance Category	Criteria
Distant	Receptor is >800m from the dust source
Intermediate	Receptor is between 401m and 800m from the dust source
Close	Receptor is <400m from the dust source.

Based on the above, the receptors for the site which are discussed in section 4.5 below will be classed as follows:

- 42 human receptors have been identified in a 1 km radius of the site, with 5 classed as close receptors, 21 classed as intermediate and 7 classed as distant receptors;
- There are 29 named and unnamed woodlands (some of which are classed as ancient) within 1km of the site – several of these are adjacent to each other so for the purposes of assessment, they have been grouped into 15 areas in the various directions and the distance then measured to the closest point. 5 areas are classed as close, 5 as intermediate and 5 as distant; and
- There are 5 watercourses within 1 km with 2 of these being classed as close and 3 as intermediate when they are measured to the closest point.

Combining the above wind frequency with receptor distance, it is possible to classify the pathway effectiveness using the IAQM method as shown in the matrix in Table 9 below

Table 9 Pathway Effectiveness

Receptor Distance Category	Frequency of Potentially Dusty Winds			
	Infrequent	Moderately Frequent	Frequent	Very Frequent
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

4.5 Sensitive Dust Receptors

Receptor sensitivity is considered on the basis of the of the factors shown in Table 10 below which are taken from the IAQM Guidance and cross-checked with receptor sensitivity shown in the EA H4 Guidance.

Table 10 Receptor Sensitivity Classification

Sensitivity	Human	Environmental
High	• Users can reasonably expect enjoyment of a high level of amenity; • Appearance, aesthetics or value property would be diminished by soiling; • People or property would be reasonably expected to be present continuously • Examples include dwellings, hospitals, schools/education, restaurants/bars, medium/ long term car parks & showrooms	• Locations with an international designation and designated features may be affected by dust soiling; • Locations where there is a community of a particularly, dust sensitive species; • Examples include SPAs
Medium	• Users would expect to enjoy a reasonable level of amenity but not to the same level as their home; • Appearance, aesthetics or value property could be diminished by soiling; • People or property would not be reasonably expected to be present continuously • Examples include parks, commercial/retail/ industrial premises and places of work.	• Locations where there is a particularly important plan species, where its dust sensitivity is uncertain or unknown; • Examples are nationally designated sites or features that may be impacted by dust deposition; • Examples include SSSIs or local wildlife sites.
Low	• Enjoyment of amenity would not be reasonably be expected: • Property would not be reasonably be expected to be diminished in appearance, aesthetics or value by soiling; • Transient exposure; • Examples would be playing fields, farmland, foot paths or short-term car parks and road.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative examples are a local nature reserve with dust sensitive features.

Sensitive dust receptors which could be impacted by the operation of the plant include residential, commercial and industrial receptors along with a number of environmental receptors. The likely receptors are listed in Table 11 below and are shown on the plan BA236000 attached in Appendix A. Where farms are considered the residence and the farmland have been considered separately.

Table 11 Sensitive Receptors

Receptor	Description	Type	Distance	Direction	Sensitivity	Distance Category
HUMAN RECEPTORS						
R1	Greylands Commercial Centre	Commercial & Residential	700m	E	High	Intermediate
R2	Greylands Lodge	Commercial	450m	E	Medium	Intermediate
R3	Greylands Farm	Farmland	750m	SSE	Low	Intermediate
		Residential			High	
R4	Andrews Farm	Farmland	750m	SSW	Low	Intermediate
		Residential			High	
R5	Lower Chickens Farm	Farmland	800 m	WSW	Low	Intermediate
		Residential			High	
R6	Cox Farm Lodge	Residential	600m	W	High	Intermediate
R7	Cox Farm	Farmland	300m	W	Low	Close
R8	Sussex Camper Vans	Commercial	343m	NE	Medium	Close

Receptor	Description	Type	Distance	Direction	Sensitivity	Distance Category
R9	Orchard Lodge	Residential	550m	NW	High	Intermediate
R10	Durford Hill Farm	Farmland	700m	NNW	Low	Intermediate
		Residential			High	
R11	Fisher Clinical Services	Industrial	622m	N	Medium	Intermediate
R12	Broadlands Business Centre	Commercial	650m	NNE	Medium	Intermediate
R13	Weinerburger Brickworks and adjacent Business Park	Industrial	200m	SSE	Medium	Close
R14	Warnham Railway Station	Commercial	750m	S	Medium	Intermediate
R15	South Lodge	Residential	280m	NE	High	Close
R16	Boldings Brook Academy	School	714m	NW	High	Intermediate
R17	Langhurst Moat Cottage	Residential	452m	SSE	High	Intermediate
R18	Holmwood	Residential	760m	NNE	High	Intermediate
R19	Gunborn Crossing Cottages	Residential	559m	N	High	Intermediate
R20	Nowhere House	Residential	638m	NNW	High	Intermediate
R21	Richmond House	Residential	705m	NNW	High	Intermediate
R22	Wood Farm	Farmland	860m	NNW	Low	Distant
		Residential			High	
R23	Upper Chickens – Houses and Pet Supply Company	Residential Commercial	838m	NNW	High	Distant
R24	Highland House, The Mount & other residences	Residential	558m	NW	High	Intermediate
R25	Dog & Duck Pub	Commercial	678m	NNW	Medium	Intermediate
R26	Geerings	Residential	890m	W	High	Distant
R27	Police House and other adjacent residences	Residential	978m	SW	High	Distant
R28	Westons Farm & Westons Place Residential Properties	Farmland	900m	SSW	Low	Distant
		Residential			High	
R29	Lower Gate House	Residential	678m	S	High	Intermediate
R30	Pondtail Farm	Farmland	887m	SSE	Low	Distant
		Residential			High	
R31	Brittania Crest	Industrial	245m	SE	Medium	Close
R32	Biffa MMRC	Industrial	100m	E	Medium	Close
R33	Panel 2 Panel & Greens	Commercial	645m	S	Medium	Intermediate
R34	Sewage Works adjacent to Farm	Industrial	593m	SSW	Low	Intermediate
R35	Wealdon	Residential	509m	SSE	High	Intermediate

Receptor	Description	Type	Distance	Direction	Sensitivity	Distance Category
R36	Denhams Auctioneers	Commercial	534m	NW	Medium	Intermediate
R37	Sussex Health Centre	Nursing Home	580m	NW	High	Intermediate
R38	Male Journey	Commercial	660m	NW	Medium	Intermediate
R39	White Cottage Cake Company	Commercial	640m	NW	Medium	Intermediate
R40	Houses on Station Road	Residential	620m	S	High	Intermediate
R41	Little London Hill	Residential	657m	W	High	Intermediate
R42	Vale Stud Riding School	Commercial	763m	NNW	Medium	Intermediate
HABITATS						
R43	Unnamed Woodland	Woodland	110m	W	Medium	Close
R44	Unnamed Woodland	Woodland	240m	E	Medium	Close
R45	Unnamed Woodland	Woodland	380m	N	Medium	Close
R46	Cox Farm Copse	Woodland	400m	NW	Medium	Close
R47	Unnamed Woodland	Woodland	385m	S	Medium	Close
R48	Unnamed Woodland	Woodland	554m	SW	Medium	Intermediate
R49	Graylands Copse	Woodland	780m	SE	Medium	Intermediate
R50	Unnamed Woodland	Woodland	476m	SSE	Medium	Intermediate
R51	Graylands Plantation	Woodland	663m	E	Medium	Intermediate
R52	Unnamed Woodland	Woodland	708m	NNW	Medium	Intermediate
R53	Unnamed Woodland	Woodland	927m	NNW	Medium	Distant
R54	Unnamed Woodland	Woodland	896m	NNW	Medium	Distant
R55	Cox's Shaw	Woodland	820m	NW	Medium	Distant
R56	Rat's Plantation	Woodland	868m	SW	Medium	Distant
R57	Holbrook Plantation	Woodland	953m	ESE	Medium	Distant
R58	Brookhurstwood	Woodland	652m	NE	Medium	Intermediate
WATER BODIES						
R58	Boldings Brook	Waterway	30m	W	Medium	Close
R59	Little Brookhurst Gill	Waterway	400m	N	Medium	Close
R60	Great Brookhurst Gill	Waterway	600m	NE	Medium	Intermediate
R61	Geerings Gill	Waterway	480m	SW	Medium	Intermediate
R62	Durfield Gill	Waterway	690m	NW	Medium	Intermediate

4.6 Dust Risk Assessment Conclusion

Taking into consideration the above source-pathway-receptor measures it is then possible to make an evaluation of the dust impact risk utilising the IAQM Guidance. This includes making:

- An estimation of the dust impact risk based on residual source emissions and pathway effectiveness (Table 12 below);
- Considering the magnitude of the dust effect based on receptor sensitivity and the dust impact risk (Table 13 below).

There are no international, national or locally designated sites with dust sensitive features within 400m of the site so there was no further consideration of potential impacts on ecology.

Table 12 Estimation of Dust Impact Risk

Pathway Effectiveness	Residual Source Emissions		
	Small	Medium	Large
Highly Effective	Low Risk	Medium Risk	High Risk
Moderately Effective	Negligible Risk	Low Risk	Medium Risk
Ineffective	Negligible Risk	Negligible Risk	Low Risk

Table 13 Magnitude of Dust Effects

Dust Impact Risk	Receptor Sensitivity		
	Low	Medium	High
High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

From the assessment, the dust amenity effects are summarised in Table 14 on the following page.

Table 14 Risk of Dust Exposure

Receptor	Description	Type	Distance	Direction	Receptor Sensitivity	Distance Category	Wind Frequency	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Magnitude of Effect
HUMAN											
R1	Greylands Commercial Centre	Commercial Residential	700m	E	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Slight Adverse
R2	Greylands Lodge	Residential	450m	E	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Slight Adverse
R3	Greylands Farm	Farmland	750m	SSE	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Slight Adverse
R4	Andrews Farm	Farmland	750m	SSW	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R5	Lower Chickens Farm	Farmland	800m	WSW	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R6	Cox Farm Lodge	Residential	600m	W	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R7	Cox Farm	Farmland	300m	W	Low	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R8	Sussex Camper Vans	Commercial	343m	NE	Medium	Close	Moderately Frequent	Medium	Moderately Effective	Low	Negligible
R9	Orchard Lodge	Residential	550m	NW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R10	Durford Hill Farm	Farmland	700m	NNW	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R11	Fisher Clinical Services	Industrial	622m	N	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R12	Broadlands Business Centre	Commercial	650m	NNE	Medium	Intermediate	Moderately Frequent	Medium	Moderately Effective	Low	Negligible
R13	Weinerburger Brickworks and adjacent Business Park	Industrial	200m	SSE	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R14	Warnham Railway Station	Commercial	750m	S	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R15	South Lodge	Residential	280m	NE	High	Close	Moderately Frequent	Medium	Moderately Effective	Low	Negligible
R16	Boldings Brook Academy	School	714m	NW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R17	Langhurst Moat Cottage	Residential	452m	SSE	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Slight Adverse
R18	Holmwood	Commercial	760m	NNE	Medium	Intermediate	Moderately Frequent	Medium	Moderately Effective	Low	Slight Adverse
R19	Gunborn Crossing Cottages	Residential	559m	N	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R20	Nowhere House	Residential	638m	NNW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R21	Richmond House	Residential	705m	NNW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R22	Wood Farm	Farmland	860m	NNW	Low	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R23	Upper Chickens – Houses and Pet Supply Company	Residential Commercial	838m	NNW	High	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R24	Highland House, The Mount & other residences	Residential	558m	NW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R25	Dog & Duck Pub	Commercial	678m	NNW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R26	Geerings	Residential	890m	W	High	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R27	Police House and other adjacent residences	Residential	978m	SW	High	Distant	Frequent	Medium	Moderately Effective	Low	Negligible
R28	Westons Farm & Westons Place Residential Properties	Farmland	900m	SSW	Low	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R29	Lower Gate House	Residential	678m	S	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible

Receptor	Description	Type	Distance	Direction	Receptor Sensitivity	Distance Category	Wind Frequency	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Magnitude of Effect
R30	Pondtail Farm	Farmland	887m	SSE	Low	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
		Residential			High						Negligible
R31	Brittania Crest	Industrial	245m	SE	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R32	Biffa MMRC	Industrial	100m	E	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R33	Panel 2 Panel & Greens	Commercial	645m	S	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R34	Sewage Works adjacent to Farm	Industrial	593m	SSW	Low	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R35	Wealdon	Residential	509m	SSE	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R36	Denhams Auctioneers	Commercial	534m	NW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R37	Sussex Health Centre	Nursing Home	580m	NW	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R38	Male Journey	Commercial	660m	NW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R39	White Cottage Cake Company	Commercial	640m	NW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R40	Houses on Station Road	Residential	620m	S	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R41	Little London Hill	Residential	657m	W	High	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R42	Vale Stud Riding School	Commercial	763m	NNW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
HABITATS											
R43	Unnamed Woodland	Woodland	110m	W	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R44	Unnamed Woodland	Woodland	240m	E	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R45	Unnamed Woodland	Woodland	380m	N	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R46	Cox Farm Copse	Woodland	400m	NW	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R47	Unnamed Woodland	Woodland	385m	S	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R48	Unnamed Woodland	Woodland	554m	SW	Medium	Intermediate	Moderately Frequent	Medium	Moderately Effective	Low	Negligible
R49	Graylands Copse	Woodland	780m	SE	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R50	Unnamed Woodland	Woodland	476m	SSE	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R51	Graylands Plantation	Woodland	663m	E	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R52	Unnamed Woodland	Woodland	708m	NNW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible
R53	Unnamed Woodland	Woodland	927m	NNW	Medium	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R54	Unnamed Woodland	Woodland	896m	NNW	Medium	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R55	Cox's Shaw	Woodland	820m	NW	Medium	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R56	Rat's Plantation	Woodland	868m	SW	Medium	Distant	Moderately Frequent	Medium	Ineffective	Negligible	Negligible
R57	Holbrook Plantation	Woodland	953m	ESE	Medium	Distant	Infrequent	Medium	Ineffective	Negligible	Negligible
R58	Brookhurstwood	Woodland	652m	NE	Medium	Intermediate	Moderately Frequent	Medium	Moderately Frequent	Low	Negligible
WATER BODIES											
R58	Boldings Brook	Waterway	30m	W	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R59	Little Brookhurst Gill	Waterway	400m	N	Medium	Close	Infrequent	Medium	Ineffective	Negligible	Negligible
R60	Great Brookhurst Gill	Waterway	600m	NE	Medium	Intermediate	Moderately Frequent	Medium	Moderately Frequent	Low	Negligible
R61	Geerings Gill	Waterway	480m	SW	Medium	Intermediate	Moderately Frequent	Medium	Moderately Frequent	Low	Negligible
R62	Durfield Gill	Waterway	690m	NW	Medium	Intermediate	Infrequent	Medium	Ineffective	Negligible	Negligible

4.7 Risk Mitigation and Management

4.7.1 Introduction

In relation to mitigation and management of the potential dust risks associated with the site activities, the management and controls to be applied at the site are detailed in sections 5 and 6 below. A summary of each proposed control is presented in Appendix B along with the description of the effect and how it will interrupt the source-pathway-receptor linkage.

A risk matrix is presented in Appendix C which summarises the overall risk assessment and uses a scoring mechanism, whereby scores are assigned to:

- The probability of the dust hazard occurring without the use of protective measures;
- The consequences of the dust hazard to the environment or human health without mitigation of control in place.

Multiplying these scores together provides an indication to the acceptably of the activity without the control/mitigation measures being employed.

Risk Factor = probability x consequence

The control and mitigations being employed are then detailed and a score for the expected effectiveness of the controls is given. A mitigated risk factor is determined:

Mitigated Risk Factor = Risk factor / mitigation factor.

The lower the mitigated risk, then the more effective the controls and mitigations employed are expected to be.

4.7.2 Scoring Mechanism

The risk assessment methodology has been developed using a scoring mechanism, whereby scores are assigned to:

- The probability of the hazard occurring without the use of protective measures;
- The consequences of the hazard to the environment or human health; and
- The effectiveness of the control/mitigation used to prevent the hazard occurring.

The scoring system used for the assessment is shown in Table 15 below.

Table 15 Risk Assessment Scoring Mechanism

FREQUENCY OF OCCURRENCE		
Frequency	**Comment**	**Score**
Never	Incident occurs once every 100 to 10,000 years	1
Very Unlikely	Incident occurs once every 10 to 100 years	2
Unlikely	Incident occurs once every 1 to 10 years	3
Somewhat Unlikely	Incident occurs at least once per year	4
Fairly Probable	Incident occurs at least once per month	5
Probable	Incident occurs at least once per week	6
CONSEQUENCE OF HAZARD TO ENVIRONMENT OR TO HUMAN HEALTH		
Consequence	**Comment**	**Score**
Minor	Onsite nuisance only no outside complaint No breach of permit	1
Noticeable	Nuisance noticeable off-site Potential for 1 – 2 complaints Reportable breach of permit	2
Significant	Severe sustained nuisance	3

	Major breach of environmental permit Numerous public complaints	
Severe	Partial plant shutdown required Replacement of part of plant Regulator (EA/HSE) involved	4
Major	Full plant shutdown required Regulatory prosecution likely	5
EFFECTIVENESS OF MITIGATION		
Mitigation Factor	**Comment**	**Score**
Non-existent	No mitigation in place	1
Ineffective	Some minor controls in place but mitigation not achieved	2
Partly effective	Basic controls in place and hazard partly mitigated but significant residual risk remains	3
Effective	Basic controls in place and hazard mitigated to an acceptable level although moderate level of residual risk may exist	4
Very effective	Processes fully controlled (basic/advanced) and hazard mitigated to recognised standard. Some minor residual risk may remain	5
Entirely effective	Processes fully controlled to level in excess of recognised standards. Hazard mitigation entirely effective and no residual risk remains	6

The completed risk and mitigation matrix is attached at Appendix C.

5. Management Arrangements

5.1 Structure

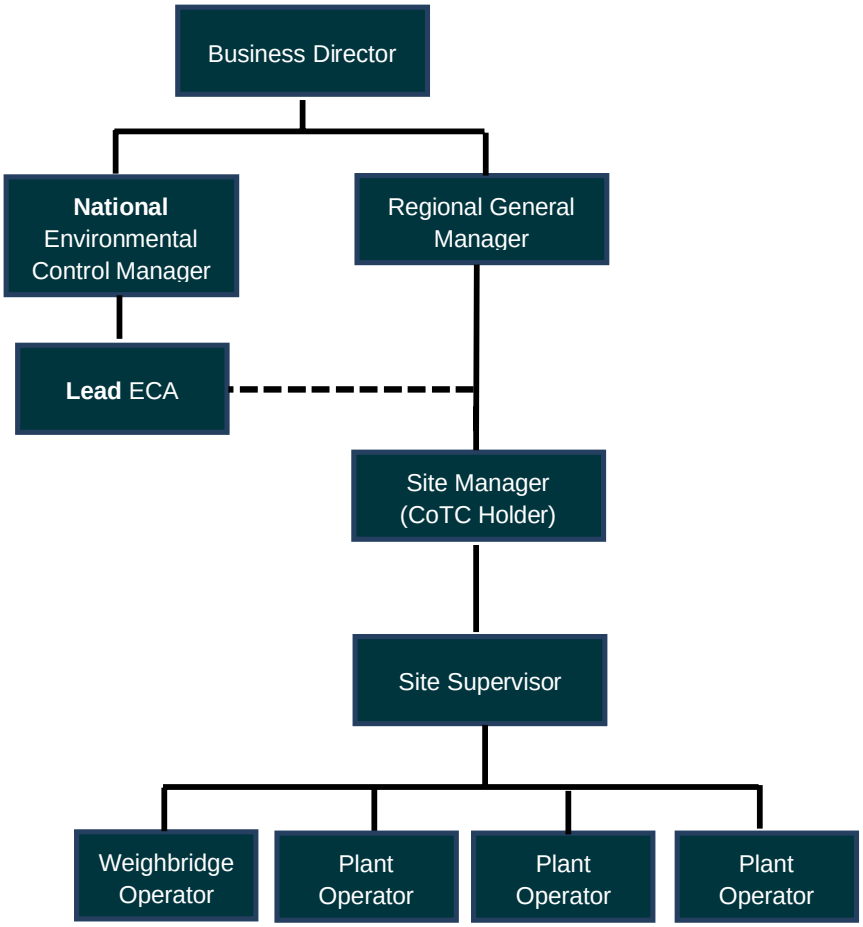
Environmental responsibility for individual operations will be assigned throughout the site management structure and are defined through the management system.

The Site Manager is the designated management representative, with overall control of the management system at the plant including the ability to ensure programmes are realised and translated into activities on the plant. The Site Manager or his nominated Deputy has responsibility for ensuring the requirements of this DEMP is implemented.

Operational staff for the facility are shared with the adjacent landfill to provide operational flexibility and line responsibilities of staff are presented in Figure 3 below.

Some brief descriptions of the responsibilities of those staff that are involved in operating the plant are outlined below.

Figure 3 Site Organogram



Some brief descriptions of the responsibilities of those staff that are involved in operating the plant are outlined below:

Table 16 Risk Responsibility of Role Function

Position	Responsibility
Site Supervisor	The Site Supervisor acting as the day-to-day manager of facility operatives, will have responsibility for ensuring that: • The site is available to receive waste; • The site is operating within the parameters of the Environmental Permit and appropriate planning regulations including dust management requirements;

Position	Responsibility
	• Any dust complaints are fully investigated, and appropriate corrective action is taken as necessary; and • Regular daily inspections are undertaken to check for dust emissions. The Supervisor will report directly to the Site Manager of the Brookhurst Wood Landfill.
Plant Operator	The Plant Operator will be experienced in operating loading equipment and will be certified as competent via the CITB training scheme or equivalent. The Plant Operator will be responsible for the daily inspection of the equipment, defect reporting, stockpiling and loading operations and maintaining the safety and security of the tipping floor. Liaison with the Weighbridge Operator with regard to incoming and outgoing vehicles will form part of the postholder's duty.
Weighbridge Operator	An experienced Weighbridge Operator will ensure that vehicles entering the site are authorised using the computerised transaction system. In addition, the correct operation of the weighbridge, the computerised transaction recording, duty of care checks and liaising with the Plant Operator by radio will form part of the postholder's duties. The weighbridge operator will be responsible for identifying any particularly dusty waste loads delivered at the point of waste acceptance.

5.2 Technical Competence

A technically competent person will be available on site in accordance with the regulatory attendance requirements. In his absence a nominated deputy will be available. The technically competent person, or nominated deputy, will be responsible for the control of incoming and outgoing vehicles, checking Duty of Care documentation, inspecting waste to ensure compliance with permit conditions, keeping and maintaining all records. The technically competent person, or nominated deputy, will have overall responsibility for ensuring high standards of housekeeping and odour control are maintained throughout the site as a whole.

5.3 Training Provision

All staff will receive instruction and training, both verbal and documented, in all relevant aspects of operational procedures, permit requirements in relation to operations and the environment, health and safety and general requirements of the site management plan. A copy of the permit and approved site management plan will be kept available on site for reference when required by all site staff carrying out work under the requirements of the permit.

Wherever possible, training will be delivered in the workplace by internal training staff or by managers, although formal training courses will be employed were required.

In relation to dust management, this will be incorporated into the general site operational training and will cover dust awareness in relation to normal, abnormal and maintenance situations and include management of dust complaints.

5.3.1 New Starters

Each position at the site will be covered by a general job description detailing key skills, responsibilities and reporting structure. It will be standard procedure for new process operators to be given comprehensive "on the job" training before they take full responsibility for their post. Supervision will be provided for as long as is necessary to ensure that the required skills have been imparted. In addition, specific full training on key tasks will be given to both new and experienced operators as necessary.

5.3.2 Contractors

Site rules will be provided to all contractors using or visiting the site. These rules will describe basic safety and operational precautions to be observed while at the site.

Instances of drivers or contractors not following site rules or behaving inappropriately will result in warnings. If necessary, requests to leave site and/or barring from future visits to the site will be implemented.

5.4 Management System

Biffa operates an integrated management system which meets the requirements of:

- BS EN ISO 9001:2015– Quality Management Systems
- BS EN ISO 14001:2015 – Environmental Management Systems
- BS OHSAS 45001:2018 – Occupational Health and Safety Management Systems

6. Dust and Particulate Management

6.1 General Controls

6.1.1 Dust Suppression

In addition to those controls inherent to the facility and plant design discussed in the following sections, during dry conditions, the potential for dust emissions is increased and may constitute a hazard to health or be to a dis-comfort of neighbours, visitors or employees. During such periods an appropriate dust suppression technique will be employed on internal roads, tipping areas and stockpiles. Techniques to be utilised at the site may incorporate dust suppression via bowser as appropriate.

The site inspection/housekeeping procedure sets out a number of conditions to be checked and the actions to be taken dependent on the outcome of the inspection. This includes a number of situations which will result in the use of dust suppression.

A generator will be maintained on site as contingency power supply, and a stock of spare parts will be present on site with a regularly checked inventory. There will also be more than one mobile dust suppression unit at any one time with not all activities that could generate dust being concurrent so this contingency would allow for units from different areas to be utilised in the event of failure and prolonged maintenance/ replacement.

6.1.2 Housekeeping

The site will maintain high standards of housekeeping which will be ensured through the implementation of the Site Inspection and Housekeeping Procedure .

With the exception of small spillages in the yard, sweeping will generally be undertaken by mechanical means. The frequency of use of such a sweeper is dependent on the prevalent conditions and decisions on use will be made by the Site Manager or nominated Deputy taking into consideration the weather (wet, dry, windy, etc) and the condition of site roads and yard area during the site inspection

6.2 Waste Acceptance Procedures

6.2.1 Vehicles

Loads arriving at site will be covered with tarpaulin, sheeting or other suitable cover and these will not be uncovered until inspected at the weighbridge

All loads of secondary aggregates, compost or treated waste materials leaving the installation will also be sheeted at the point of loading

6.2.2 Waste Acceptance

All vehicles currently delivering waste to the ATRF plant will have to pass through the main entrance to the Brookhurst Wood landfill, where the shared weighbridge and gatehouse facilities will be used. Once the new OWC facility is built, all vehicles delivering waste to both the ATRF and the OWC plant will have to pass through a new weighbridge on the OWC access road.

At the weighbridge, the operator will evaluate the incoming waste load in accordance with site procedures. Providing the incoming waste is acceptable, the driver will be provided with the correct discharge code and will be directed to the relevant discharge area for the ATRF or OWC. In the event that waste does not meet the Waste Acceptance Criteria, or is particularly dusty, the load(s) will be rejected in accordance with site procedures. As such closure of the installation or in certain meteorological conditions is not considered necessary.

The vehicle, quantity, type and origin of the waste will be recorded in accordance with the Environmental Permit.

6.3 Waste Composition

If the weighbridge operative deems that the waste is unacceptable under the terms of the permit, due to presence of high levels of dust without the appropriate level of control outlined above, then entry to the site will be refused and the registration number of the vehicle recorded separately in the site diary.

In the event that such a waste is identified by the site operators during load discharge/offloading, then the following action will be taken:

- The waste load will be segregated in an isolation area and photographed;
- The Site Supervisor will be notified;
- and

The waste will be treated with water to control any dust

6.4 Storage of Waste and Process Outputs

During normal operational periods, incoming waste will be stored for time periods in accordance with Section 3.7 of the Site Management Plan (Ref 60684371-ACM-00-XX-RP-EN-MMP-R03 Management Plan, in Application Part 3), so as to maintain the availability of waste for short periods of non-delivery (e.g., Bank Holidays).

6.5 Cleaning

Operational areas and wheeled loaders within the facility, external roads and drainage channels will be regularly cleaned so as to prevent the build-up of dusts from old degrading material. The frequency and procedure for the cleaning activity will be developed and implemented in accordance with the maintenance plan for the facility.

6.6 Roads and Traffic Management

6.6.1 Site Roads

A hard surfaced access road will be provided from the installation entrance. This hard surfaced road will act to minimise the potential for carriage of mud onto the surrounding land and public highways.

Subsidiary installation roads will be constructed from concrete, hardcore or other suitable material to provide sufficient run off for vehicles using the installation. Internal road surfaces will be maintained regularly and will be designed to avoid sharp corners and steep gradients that would encourage sharp breaking.

The site access roads are inspected as part of the site daily inspection and the road sweeper will be put into use if:

- Mud, dust, litter or debris is found to be present on the access road;
- Alternative wheel wash arrangements are not available resulting in dirt or mud carry over onto the access route;
- Ambient conditions (e.g., very dry) conditions require the removal of surface dust – alternatively a bowser may be used to suppress any potential dust that may be used.

6.6.2 Vehicle Speed Limits

Speed restrictions of 10mph will be imposed for all vehicles driving on the site, in order to minimise emissions of dust from internal road surfaces.

6.6.3 Sweeping of Access Road and Highway

When required, additional road sweeping will be employed to clean the tarmac surfaced access road and public highway around the entrance. Such equipment will be hired on the same day as any such problem is identified or as soon as possible thereafter subject to contractor availability.

6.6.4 Vehicle Sheeting

All vehicles using the installation will be required to ensure that all loads (waste or aggregates) are adequately sheeted or otherwise contained prior to exiting the site onto the public highway.

6.6.5 Prevention of Airborne Materials from Vehicle Wheels

Arrangements will be provided to facilitate the cleaning of vehicle wheels in the event that delivery/collection vehicles pick up material on their wheels.

The facilities to wash vehicle wheels should be available for the majority of the operational hours, with the only exceptions being during either a breakdown or during a service.

The operation of the wheel washing arrangements will be checked during the daily site inspection and any defects will be reported at that stage and alternative arrangements will be implemented if repairs need to be undertaken. Additionally, drivers can report issues at the weighbridge who in turn will notify the Site Manager such that the wash can be inspected, and alternative wash arrangements implemented if repairs are required.

6.6.6 Anti-Idling Policy

The site employs an anti-idling policy where site mobile plant will be switched off when not in use.

Deliveries of waste or collection of residues/products will be scheduled as far as practicable to avoid queuing vehicles and in the unlikely event that site operational issues will result in queuing vehicles then rescheduling will be undertaken where possible. Where this can't be done drivers will be advised to switch engines off during while waiting to be discharged/loaded.

6.7 Material Storage, Processing and Handling

6.7.1 Conveyors

Conveyors are used in the ATRF and OWC processes and the following controls will be employed:

1. Height of free fall at transfer points will be minimised at all times and if required transfer points will be enclosed;
2. Drop heights at the inlet hopper will be minimised by matching the shovel and hopper such that the excavator is not too big for the hopper;
3. Matching of the shovel and the inlet hopper will minimise the potential for spillage in this area which could dry out and give rise to dust. Any spillage will be promptly removed;
4. Mechanism(s) to prevent overloading will be employed;
5. Belt scrappers will be employed in the area of head drums to minimise the accumulation of material which may become dry and result in the release of dust;
6. Planned preventative maintenance will be employed to ensure effective plant operation;
7. The screening and separation plant at the OWC will be situated with a building; and
8. Conveyors will be used for the transport of wet waste from the stockpiles to the ATRF processing areas. No emissions of dust are expected from the movement of this material and as such no specific abatement or suppression techniques are felt to be required. In the event that dust emissions occur from the conveyor system then mobile spray units will be employed.

6.7.2 Stockpiles

Stockpiles at the designated storage areas, and storage bays will be sited to take into consideration prevailing winds, sheltered positions and proximity of site operations.

Dust control and mitigation for stockpiles will include:

1. Minimisation of drop heights during placement of materials into the stockpile;
2. Location of stockpiles to provide shelter from wind;

3. Profiling of stockpile within the storage bay walls to prevent emissions by wind-whipping. Stockpile height will be kept 0.5 m below the top of the bay to minimise wind-whipping;
4. Stockpiles outside of storage bays but within designated storage areas will be covered by tarpaulins, and be limited to a maximin of 4m in height;
5. Treatment residues stored in bays will be kept 0.5m below the top of the bays to minimise wind-whipping;
6. Use of dust suppression systems to maintain the condition of the stockpile during dry, windy conditions.

6.7.3 Windrows

Windrows will be situated in the designated area of the OWC and will not exceed 4m in height. Moisture monitoring forms part of the process controls for maturation and stabilisation and in the event that moisture is too low the windrows would be conditioned with water recirculated from the surface water management system.

6.7.4 Loading and Unloading

The condition of the aggregates, compost, other treatment outputs and incoming waste materials will be assessed prior to any loading/unloading:

- if materials are dry and likely to give rise to dust emissions then it will be conditioned with water prior to movement; and
- Loading and unloading will cease during extreme wind conditions which are considered by the Site Supervisor as being likely to give rise to dust emissions from wind-whipping.

6.8 Enclosure of Process and Storage Areas

6.8.1 Enclosure of Storage Areas

The waste reception storage bays for both the ATRF and OWC will be constructed on an impermeable surface as follows:

- Incoming waste storage areas will comprise 3-sided bays formed from concrete block walls..
- Waste stockpiles will be formed within the bays and the maximum height will remain below the height of the bay wall.

6.8.2 Enclosure of OWC Separation and Screening Process

The OWC separation and screening equipment will be situated within a building which will be approximately 10 m tall and will comprise a steel frame with single skimmed box profile sheeting and pitched roof (and associated roof water storage tank). The building will be fully enclosed on three sides with the southernmost façade open to allow access to the enclosed plant.

6.8.3 ATRF Crushing Process

Crushing of specified incoming waste for recovery either with or without subsequent washing will be undertaken using mobile enclosed mechanical crushing plant. Materials for crushing may include the following treatment residues from the wash plant:

- >150mm produced from the primary intake hopper. Materials will include oversize brick, concrete, natural stones, etc and any adhered clay or soil-like particles. This material is produced under a water mist and will have a moisture content of between approximately 10% and 15% when produced.
- >100mm produced from the wet sizing screen. Materials will include oversize brick, concrete, natural stones etc. As this stage is a wet screening process any adhered fines will have been removed with the oversize material produced having a moisture content greater than 3%.
- Incoming mixtures of waste from the mechanical treatment of wastes that contain a high proportion of recoverable aggregate

Due to the removal of fines during the initial stages of the wash process and the relatively high moisture content of any residual fines content of the oversize, the handling, storage and crushing of the oversize material is not considered to be an inherently dusty process (ref. Process Guidance Note 3/16(12) Statutory guidance for mobile crushing and screening). However, dust mitigation methods specific to materials for crushing have been considered and include:

- Storage in 3-sided storage bays. This material will comprise >150mm from the primary feed hopper (Section 5.3.1) and/or >100mm from the sizing screen and the incoming glass waste.
- Prior to movement into the crushing plant, materials will be visually inspected and if deemed necessary additional moisture content assessments made to assess the need for further damping of stockpiles prior to movement and loading.
- Minimising drop heights when material is being loaded into and discharged from the crusher.
- Use of misting in and around the crushing area, and in particular on the feed hopper and conveyors.

6.9 Maintenance and Inspection Requirements

6.9.1 Plans and schedules

Site infrastructure and plant will be inspected regularly for damage and wear by the site manager or other appointed responsible person. All plant items and equipment (e.g., loading shovels, ATRF and OWC processing plant) will be serviced and maintained according to manufacturer's schedules and recommendations in order to minimise the risk of breakdown.

Plant and equipment will be inspected and serviced by Biffa utilising a plant inspection pro-forma.

Critical items will be identified and sourcing of standby equipment including delivery time will be identified. Where necessary critical spares will be held on site.

Records of inspections will be maintained in a site log. All maintenance on the plant is programmed into the company's planned preventative maintenance (PPM) system which generates work orders for the up-coming maintenance and logs when maintenance has been completed.

Trained maintenance staff can carry out plant repairs quickly where required. Mobile plant repairs can be undertaken within one working day, dependant on the availability of spares.

6.9.2 Defect Reporting and Reactive Maintenance

Mobile and fixed plant will be subject to a first use check on a daily basis to facilitate defect detection and reporting.

Defects will be logged and reported to the Biffa maintenance team so that repairs can be scheduled.

6.10 Water Usage and Availability

Water will generally be sourced from a combination of the following:

- OWC site drainage and lagoons
- Mains supply;
- Outputs from the water treatment system – as detailed in the Technical Plan treated water will be sampled and analysed to prove it is suitable for use in dust suppression; and
- Two water storage tanks (up to 75 m^3) filled with water from the OWC drainage system.

If these supplies are not available, then water can be sourced from:

- lagoons on the wider landfill site and MBT site; and
- in extreme cases water can be regularly tankered to site to fill these tanks if insufficient water is available.

Ultimately, if insufficient water is available to mitigate dust emissions, operations at the site will cease until sufficient control measures can be put in place.

7. Monitoring and Action Plan

7.1 Overview of the Monitoring Plan

To ensure that dust emissions from the facility do not result in nuisance at sensitive receptors, Biffa will monitor dust emissions by:

- Visual assessments of site operations;
- Daily site inspection;
- Monitoring of dust complaints;
- Daily monitoring of meteorological information and weather forecasts; and
- If a sustained period of justified dust complaint should arise, Biffa will review existing procedures and other management and control techniques as necessary.

7.2 Monitoring Plan

7.2.1 Visual Monitoring

All personnel on site will be instructed during operational training to undertake visual monitoring of all site operations each day. All noted visible dust emissions will be reported to the Site Supervisor who will be responsible for investigating the incident, implementing remedial action and recording details.

The location of the monitoring points are shown on the plan in Appendix A.

7.2.2 Site Inspection

The Site Manager or nominated deputy will undertake a daily site inspection, which will include an assessment of all site operations with respect to release of dust. This inspection will be recorded in the daily log and will include details of all incidents of dust release and remedial actions completed. Plant operational conditions and availability will also be logged.

7.2.3 Quantitative Monitoring

Quantitative monitoring of the operational area, site boundary or sensitive receptors will be undertaken in circumstances where complaints have been received and one of the following conditions are met:

1. Corrective action has not resolved the problem; or
2. Monitoring will assist in determining source/cause and what further remedial action may be required.

Results of all quantitative monitoring will be recorded and evaluated.

Quantitative monitoring will be undertaken in accordance with the Agency Guidance “M17 – Monitoring of Particulate Matter in Ambient Air Around Waste Facilities” or other agreed guidance.

7.2.4 Monitoring of Meteorological Information

Monitoring of meteorological information and weather forecasts can assist in the management of dust emissions from the site. Some meteorological conditions can exacerbate the risk of dust emission annoyance at sensitive receptors, for example dry weather and high wind speed.

Monitoring of meteorological information (temperature, wind speed, wind direction and precipitation) and checking of weather forecasts will be completed daily by the Site Manager or nominated deputy.

The information and weather forecasts will be used in the following ways:

- To predict when weather conditions are likely to cause dust dispersion to sensitive receptors, to enable site controls to be amended if required;

- To plan where monitoring of the site boundary should take place during normal operations in order to correctly assess dust impacts;
- To predict the areas where potential dust impacts may occur during abnormal events; and
- During the investigation of dust complaints to ascertain complainant's observations.

7.2.5 Complaints Monitoring

Biffa recognise that complaints data is probably the most direct and reliable form of monitoring whether dust emissions beyond the site boundary are causing an annoyance. Therefore, Biffa will record complaints, respond to them and communicate with the complainants.

Complaints will be collected, registered and investigated as described in the following section 8.

7.3 Dust Action Plan

If significant levels of dust, i.e., those which are considered likely to cause a nuisance or a health hazard, are noted during site inspections, visual assessments or following receipt of complaints, the following actions will be taken:

1. Site operations will be reviewed to identify the source of dust and the operation generating dust will be ceased until effective remedial action can be taken;
2. Site operations will be reviewed to ensure that all aspects of the dust management scheme are being adhered to;
3. Remedial action appropriate to the identified source of the dust release will be implemented. Such action may include temporary relocation of the operation causing the dust release, introduction of additional control measures such as extra water sprays or complete cessation of operations; and
4. Following remedial action being implemented, the Site Supervisor will review site operational procedures and amendments will be introduced as appropriate to minimise risk of recurrence. Any revision of site procedures will be followed by operator briefing on the new requirements.

The compliance assessment criteria for visual monitoring is 'no significant levels of dust being generated', if significant volumes of dust are being noted at the installation during routine visual monitoring the following action will be taken.

7.3.1 Dust Generation during Vehicle Movements

- Take action to ensure that vehicles are obeying the site speed limits;
- Organise additional road sweeping; and
- Consider erecting static water sprays in strategic locations.

7.3.2 Dust Generation during Waste Handling

- Establish cause of emissions;
- If the problem is caused by a particular waste type, cease accepting the relevant waste until a suitable method statement detailing how the waste will be handled has been prepared and implemented; and
- If dust is caused by general tipping and stockpile formation, arrange for area to be sprayed with water.

7.3.3 Directional Monitoring

During periods where quantitative monitoring is employed with the use of the Frisbee gauge and the assessment level of 200 mg/m2/day is repeatedly exceeded, the site shall look to implement a form of directional dust deposition monitoring. Directional dust monitoring will allow the deposited dust generated from the site to be measured in comparison to the surrounding background levels. As the site is surrounded by landfill, a third party waste transfer station, brickworks and agricultural land which are a potential sources for dust generation which could attribute to the total dust deposition measured using

the Frisbee gauge, the method of directional dust monitoring would be agreed with the Environment Agency.

7.3.4 Suspended Particulate Monitoring

Where the directional dust deposition monitoring is employed as outlined in 7.3.3 above and the assessment level of 200 mg/m2/day is repeatedly exceeded, the site will look to design and implement a monitoring plan to measure suspended particulates PM10 against the EC directive limit value of 50 µg/m3 not to be exceeded more than 35 times per year. The method of the suspended particulate monitoring will be agreed with Environment Agency.

8. Recording Results, Reporting and Actions

8.1 Complaints Procedure

Biffa's complaints procedure will be incorporated into the site management system to ensure that dust complaints are handled correctly and systematically and acted upon. The complaints procedure will be maintained as part of the IMS system, and will outline how Biffa will;

- Respond to dust complaints;
- Investigate dust complaints, take appropriate steps and actions and communicate with relevant stakeholders; and
- Communicate to appropriate bodies routinely and in response to any abnormal events or planned maintenance.

Initial details of the complaint will be recorded in the compliance database which will ensure data is collected and recorded in a systematic way.

The compliance database is accessible by the Site Manager and other Senior Managers and will be reviewed at least quarterly for trend analysis.

In order to assist with complaints monitoring the following additional information should be collected either by observation or further investigation:

- Meteorological conditions at the time of the complaint (e.g., wind direction, speed);
- Operational incidents at the time of the complaint; and
- Any off-site activities ongoing at the time of complaint (e.g., agricultural operations).

Initial screening of the complaint will be undertaken by the Duty Supervisor in order to establish if a dust incident has actually taken place. Screening will consider:

- Knowledge of potential dust sources at the facility;
- Knowledge of operational issues or plant defects that could contribute to dust release;
- Consideration of potential external dust sources;
- Location and distance of complainant from the site; and
- Results of any site monitoring already taking place.

If no such dust incident can be confirmed, then further investigation will not be required. However, if a dust incident is confirmed a more detailed investigation will occur. If the communication is significant, the Duty Supervisor shall notify the Site Manager or nominated deputy as soon as possible.

Once screening has been completed Biffa will provide feedback to the complainant including details of any action that has/will be taken. The output of all complaints investigation and associated corrective actions will be logged into the compliance database.

The local community via a liaison group have access to both an email and the phone number of the control room at the adjacent Biffa MBT facility which is manned 24/7 with which to raise concerns relating to the operation of the landfill, MBT or ATRF/OWC. In the event, the control room is contacted out of hours, regarding a complaint relating to the ATRF/OWC facility, then the Duty Supervisor would contact the 'on-call' Manager so the necessary actions can be taken. Additionally an emergency contact number (0800 9176896) is displayed on the signage at the site entrance.

8.2 Recording Results and Reporting

Records of all dust monitoring undertaken, as described in this DEMP, will be maintained by Biffa. Records will be retained as stipulated in the Environmental Permit.

8.3 Reporting

Biffa will report monitoring results as stipulated by the Environmental Permit. Dust complaint reports will be reported to the EA in line with permit requirements.

Records will be retained for a minimum of 6 years.

8.4 Actions in the Event of Abnormal Emissions

In the event that daily dust monitoring indicates abnormal emissions from the facility are occurring, the site management team will implement the following actions:

- Check relevant items of dust control equipment in order to identify likely cause of abnormal emission;
- If possible, take immediate steps to eliminate the cause of the abnormal situation including contacting the maintenance operative if necessary - to obtain telephone support / advice or to request attendance on site; and
- Record response to abnormal emission and remedial action taken.

Details of the trigger parameters and associated contingency actions for odour control are presented in Appendix E.

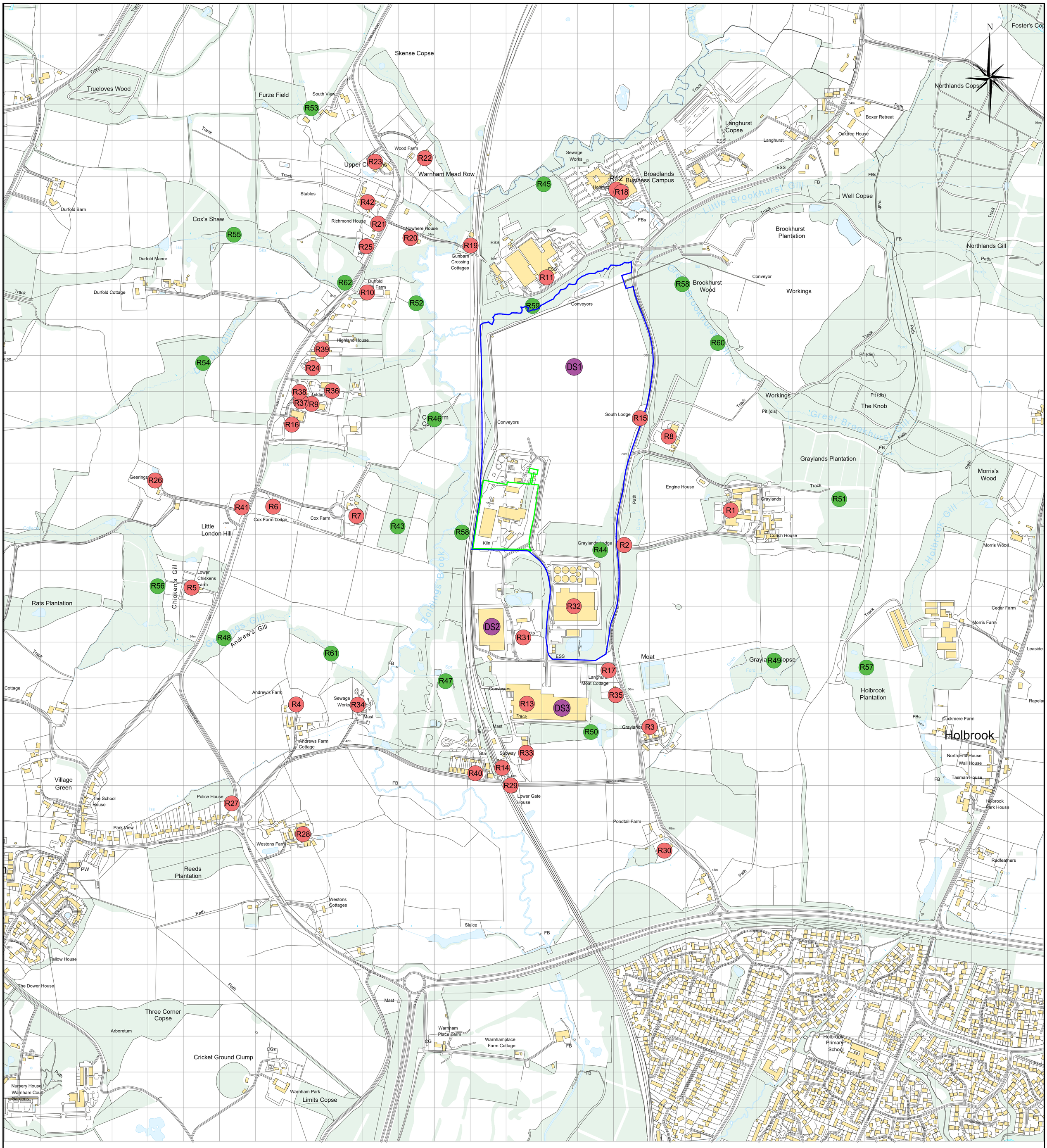
8.5 Review of DEMP

The effectiveness of the DEMP will generally be reviewed at least once per annum based on a review of the dust complaints recorded and upheld during the previous 12 months. The review of the DEMP may be undertaken at a frequency of less than 1 year in the event of:

- A sustained period of justified dust complaints; or
- Following the introduction of new treatment processes or changes to existing processes; or

Acceptance of waste from new sources where the pre-acceptance checks indicate that that additional dust controls may be necessary based pre-acceptance checks.

Appendix A Drawings and Plans



KEY

- INSTALLATION BOUNDARY
- LAND IN BIFFA CONTROL
- TEMPORARY ACCESS FOR CONSTRUCTION

SENSITIVE HUMAN RECEPTORS

R1 Greylands Industrial Park
R2 Greylands Lodge
R3 Greylands Farm
R4 Andrews Farm
R5 Lower Chickens Farm
R6 Cox Farm Lodge
R7 Cox Farm
R8 Sussex Camper Vans
R9 Orchard Lodge
R10 Durford Hill Farm
R11 Fisher Clinical Services
R12 Broadlands Business Centre
R13 Weinerburger Brickworks and adjacent Business Park
R14 Warnham Railway Station
R15 South Lodge
R16 Boldings Brook Academy
R17 Langhurst Moat Cottage
R18 Holmwood
R19 Gunborn Crossing Cottages
R20 Nowhere House
R21 Richmond House
R22 Wood Farm
R23 Upper Chickens - Houses and Pet Supply Company
R24 Highland House, The Mount & other residences
R25 Dog & Duck Pub
R26 Geerings
R27 Police House and other adjacent residences
R28 Westons Farm & Westons Place Residential Properties
R29 Lower Gate House
R30 Pondtail Farm
R31 Brittaniacrest Recycling
R32 Biffa ATRF
R33 Panel 2 Panel & Greens
R34 Sewage Works adjacent to Farm
R35 Wealdon
R36 Denhams Auctioneers
R37 Sussex Health Centre
R38 Male Journey
R39 White Cottage Cake Company
R40 Houses on Station Road
R41 Little London Hill
R42 Vale Stud Riding School

SENSITIVE ENVIRONMENTAL RECEPTORS

R43 Unnamed Woodland
R44 Unnamed Woodland
R45 Unnamed Woodland
R46 Cox Farm Copse
R47 Unnamed Woodland
R48 Unnamed Woodland
R49 Graylands Copse
R50 Unnamed Woodland
R51 Graylands Plantation
R52 Unnamed Woodland
R53 Unnamed Woodland
R54 Unnamed Woodland
R55 Cox's Shaw
R56 Rat's Plantation
R57 Holbrook Plantation
R58 Brookhurstwood
R58 Boldings Brook
R59 Little Brookhurst Gill
R60 Great Brookhurst Gill
R61 Geerings Gill
R62 Durfield Gill

POTENTIAL SOURCES OF DUST

DS1 Adjacent Landfill
DS2 Britannia Crest Waste Transfer Station
DS3 Wienerberger Brickworks

REV.	DATE	DRAWN	DESCRIPTION

Biffa Waste Services Ltd
Redhill Landfill Site
Cormongers Lane,
Nutfield, Redhill
RH1 4ER
Tel. 01737 765042
Mob: 07921 386021

E-mail phil.mumford@biffa.co.uk

PROJECT	COMPOSTING SITE DEVELOPMENT	DRAWN	AAO
LOCATION	BROOKHURST WOOD LANDFILL SITE	DATE	07/23
DRAWING TITLE	RECEPTOR PLAN	SCALE(S)	1:500 @ A1
DRAWING No.		COMPUTER REF.	BA236000

Appendix B Summary of Measures for Dust Control

Abatement Measure	Where Implemented	How Source-Pathway-Receptor Linkage is Broken	Trigger for implementation
Preventative Measures			
Enclosure	The waste reception area for both the ATRF and OWC is constructed using concrete block walls to form reception bays which are enclosed on three sides. The separation and screening processes for the OWC are enclosed within a building. The crushing operation at the ATRF will be undertaken by an enclosed crusher.	The use of bays which will be situated to avoid wind whipping is further enhanced by ensuring stockpile heights remain 0.5m below the height of the bay wall minimizes the risk of dust emissions. In extreme conditions tarpaulins can be deployed providing a solid barrier between the dust source and the receptor. The enclosure of separation and screening activities within an enclosed building provides a solid barrier between the dust source and the receptor. The use of an enclosed crusher provides a solid barrier between the dust source and the receptor.	Enclosure of the crusher and the screening/separation plant will be employed continuously.
Site / process layout in relation to receptors	Particulate emitting activities location will be optimised during the design and construction of the site to provide where practicable a greater distance to receptors located downwind of site.	Aims to reduce the distance over which debris, dust and particulates could be blown and dispersed by winds.	Location of potential particulate emitting activities will be reviewed at design stage.
Site traffic management including: • Site speed limit; • 'no idling' policy; and • minimisation of vehicle movements on site	Site will implement: • 10 mph speed limit throughout the site; • Anti-idling policy will apply to mobile plant and delivery or collection vehicles; • Delivery scheduling to minimise wait times and avoid queuing.	Should reduce emissions at source.	Speed limit and anti-idling policy will be used all the time. Waste deliveries and output collection will be scheduled to minimise queuing traffic.
Minimising drop heights for waste.	Facility design will ensure that drop heights at feed hopper and conveyor transfer points and at stockpiles are optimised. Mobile plant will be operated to ensure that waste drop height during waste handling operations is minimised.	Reduces the distance over which debris, dust and particulates could be blown and dispersed by winds.	Drop heights for conveyors will be considered during design stage. Mobile plant operators will be trained to recognised industry standards and will be required to apply good practice in respect of minimising drop heights at all times.
Good housekeeping	Site Inspection and Housekeeping Procedure.	Ensures the site will be regularly checked and issues remedied to prevent and remove dust/particulate build up.	Will be implemented across the site in line with a Site Inspection and Housekeeping Procedure.
Sheeting of vehicles	Applies to all incoming and outgoing delivery vehicles.	Prevents the escape of debris, dust and particulates from vehicles as they travel	Incoming delivery vehicles will be required to be sheeted/covered until the point of inspection at the weighbridge. All outgoing residue/product vehicles will be required to have the vehicle sheeted
Ceasing operation during high winds and/or prevailing wind direction	Applicable across the site in line with the Site Inspection and Housekeeping	Likely to reduce dust and particulate emissions.	Site Inspection and Housekeeping Procedures should be in place to identify when operations will cease. Site has a weather station to be installed.
Easy to clean concrete impermeable surfaces	In waste processing and reception storage areas.	Should reduce the amount of dust and particulate generated at ground level by vehicles and site activities.	Used in waste processing and reception areas – refer to the site plan (ref: Drawing ********)
Minimisation of waste storage heights and volumes on site	Reception storage bays will be demarcated to show the maximum stockpile height which will remain 0.5m below the top of the height of the bay wall.	Minimising the height at which waste is handled should reduce the distance over which debris, dust and particulates could be blown and dispersed by winds. Reducing storage volumes should reduce the surface area over which particulates can be mobilised.	Used for all waste/product storage stockpiles.
Long haul road	Road used to access and egress the site to the public highway.	Residual mud drops off vehicles before it reaches public highway.	Used during all operational periods.
Remedial Measures			
On-site sweeping	Used across the site yard and roadways in line with the Site Inspection and Housekeeping Procedure. Road sweepers will only be used by trained operators and will be subject to planned preventative maintenance in accordance with manufacturer recommendations.	Road sweeping vehicles damp down dust and particulates whilst brushing and collecting dust and particulates from the road surface, particularly at the kerbside.	Implemented in line with the Site Inspection and Housekeeping Procedure
Water suppression with mist sprays	Mobile cannon units will be employed which means the location can be adjusted in line with ambient wind conditions.	Assist in the damping down of dust and particulates, therefore, reducing emissions from site.	At locations identified in Drawing ******** in Appendix A. Use triggered when wind speed > 11 m/s.
Water suppression with bowser	Used on easy-to-clean, impermeable concrete surfaces (roads and yard areas) to aid maintenance of housekeeping standards.	Quick method of damping down large areas of the site and reducing dust and particulate emissions.	Use on site haul roads and yards in accordance with the Site Inspection and Housekeeping Procedure.

Appendix C Dust Risk and Mitigation Matrix

	Dust Source	Most Sensitive Receptors	Likelihood			Control Measures	Mitigation Factor	Residual Risk	Action if dust causes problem	Responsibility
			Probability	Consequence	Risk					
Normal Operations	Waste Receipt	R2, R7, R9, R13 and R15	6	3	18	• Plant Operator (Weighbridge) to identify dusty waste. Load to be dampened down before and during tipping. • Plant operator to identify if delivered dusty waste at point of tipping. Dusty waste to be treated with water. • Vehicles delivering waste to be sheeted. Such sheeting to remain in place until point of discharge is reached. • Water suppression to be available at the point of discharge in the ATRF and OWC tipping areas.	5	3.6	• Dusty waste to be rejected at the weighbridge. • Dusty waste identified upon discharge will be immediately sprayed with water.	Plant Operator to ensure relevant checks are carried out during waste receipt. Site Supervisor to ensure waste acceptance procedures followed and relevant corrective action taken.
	Unloading, handling, storage and loading of incoming wastes	R2, R7, R9, R13 and R15	6	3	18	• Materials for processing will be offloaded into designated areas for the ATRF and OWC. • OWC and ATRF reception area is constructed from concrete block walls to provide bays enclosed on three side and positioned to avoid wind whipping. • Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste. • . • Mobile water suppression to be available at ATRF/OWC for site storage bays and site stockpiles. • Minimisation of drop heights during placement of materials into the stockpiles. • Profiling of stockpiles within the storage bay walls and keeping height 0.5m below the top of the storage bay height to prevent emissions by wind-whipping. • Use of appropriate dust suppression systems to maintain the condition of the stockpiles during dry, windy conditions.	5	3.6	• Dusty waste to be rejected at the weighbridge. • Dusty waste identified upon discharge will be immediately sprayed with water. • Review housekeeping procedures. • Review handling procedures. • Use of tarpaulins for bays in extreme weather conditions.	Plant Operator to ensure unloading, handling, storage and loading procedures are adhered to.
	Roads and Site Vehicles	R2, R7, R9, R13 and R15	6	4	24	• A hard surfaced access road will be provided from the installation entrance. • Subsidiary installation roads will be constructed from concrete, hardcore or other suitable material to provide sufficient run off for vehicles using the installation. Internal road surfaces will be maintained; and will be designed to avoid sharp corners and steep gradients that would encourage sharp breaking. • Speed restrictions of 10mph will be imposed for all vehicles driving on the site, to minimise emissions of dust from internal road surfaces. • All vehicles using the installation will be required to ensure that all loads (waste or aggregates) are adequately sheeted or otherwise contained prior to exiting the site onto the public highway. •	5	4.8	• When required, additional road sweeping will be employed to clean the tarmac surfaced access road and public highway around the entrance. Such equipment will be hired on the same day as any such problem is identified or as soon as possible thereafter subject to contractor availability.	Site Supervisor
	Storage of materials	R2, R7, R9, R13 and R15	6	3	18	• External stockpiles to be located to provide shelter from the wind. • Minimisation of drop heights during placement of materials into the stockpile. • Profiling of stockpile within the storage bay walls and ensuring height is kept 0.5 m below the height of the storage bay walls to prevent emissions by wind-whipping. • Use of appropriate dust suppression systems to maintain the condition of the stockpile during dry, windy conditions.	5	3.6	• Deploy water suppression if dust control becomes an issue. •	Site Manager and/or Site Supervisor
	Waste Processing Through the Wash Plant at the ATRF	R2, R7, R9, R13 and R15	5	3	15	• Height of free fall at transfer points will be minimised at all times. • Drop heights at the inlet hopper to ATRF wash plant will be minimised by matching the shovel and hopper such that the excavator is not too big for the hopper. • Matching of the shovel and the inlet hopper will minimise the potential for spillage in this area which could dry out and give rise to dust. Any spillage will be promptly removed. • Mechanism(s) to prevent overloading will be employed. • Belt scrappers will be employed on ATRF process around head drums to minimise the accumulation of material which may become dry and result in the release of dust. • Planned preventative maintenance will be employed to ensure effective plant operation. • ATRF conveyors will be used for the transport of wet material to the processing area. No emissions of dust are expected from the movement of this material and as such no specific abatement or suppression techniques are felt to be required.	5	3.0	• In the event that dust emissions occur from the hopper and/or conveyor systems then mobile spray units will be employed	Site Manager and/or Site Supervisor
	Crushing at the ATRF	R2, R7, R9, R13 and R15	5	3	15	• Height of free fall at transfer points will be minimised at all times. • Drop heights at the inlet hopper to the crusher will be minimised by matching the shovel and hopper such that the excavator is not too big for the hopper. • Matching of the shovel and the inlet hopper will minimise the potential for spillage in this area which could dry out and give rise to dust. Any spillage will be promptly removed. • Site will utilize an enclosed crusher equipped with dust suppression.	5	3.0	• If dust emissions occur from the crusher then mobile spray units will be employed	Site Manager and/or Site Supervisor

	Dust Source	Most Sensitive Receptors	Likelihood			Control Measures	Mitigation Factor	Residual Risk	Action if dust causes problem	Responsibility
			Probability	Consequence	Risk					
						• Mechanism(s) to prevent overloading will be employed. • Planned preventative maintenance will be employed to ensure effective plant operation.				
	Shredding of Waste at the OWC	R2, R7, R9, R13 and R15	5	3	15	• Height of free fall at transfer points will be minimised at all times. • Drop heights at the inlet hopper to the shredder will be minimised by matching the shovel and hopper such that the excavator is not too big for the hopper. • Matching of the shovel and the inlet hopper will minimise the potential for spillage in this area which could dry out and give rise to dust. Any spillage will be promptly removed. • Site will utilize a shredder equipped with dust suppression. • Mechanism(s) to prevent overloading will be employed. • Planned preventative maintenance will be employed to ensure effective plant operation.	5	3.0	• If dust emissions occur from the shredder then mobile spray units will be employed	Site Manager and/or Site Supervisor
	Screening and separation at the OWC	R2, R7, R9, R13 and R15	5	3	15	• The screening and separation plant is housed within a building. • Height of free fall at transfer points will be minimised at all times. • Drop heights at the inlet screening and separation plant will be minimised by matching the shovel and hopper such that the excavator is not too big for the hopper. • Matching of the shovel and the inlet hopper will minimise the potential for spillage in this area which could dry out and give rise to dust. Any spillage will be promptly removed. • Mechanism(s) to prevent overloading will be employed. • Belt scrappers will be employed on screening and separation plant conveyors around head drums to minimise the accumulation of material which may become dry and result in the release of dust. • Planned preventative maintenance will be employed to ensure effective plant operation.	5	3.0		Site Manager and/or Site Supervisor
	Stabilisation and maturation at OWC	R2, R7, R9, R13 and R15	5	3	15	• Windrows will be formed to a maximum 4m height and process monitoring will include ensuring moisture levels are maintained at the correct levels. • Windrows will be conditioned with water from the site drainage and storage lagoon system.	5	3.0	• Mobile water suppression to be available at if required.	Site Manager and/or Site Supervisor
Abnormal Conditions	Delivery of large volume of incoming waste over a short period of time	R2, R7, R9, R13 and R15	2	4	8	Biffa will exercise the following with regards to their waste suppliers: • Define maximum tonnages that can be accepted on a daily basis; • Agree delivery schedule with consideration of public holidays; • Stipulate the remit for the rejection of wastes if the facility is over supplied and daily recording of quantity of waste accepted into facilities; • Contingency plan for management of over-supply of waste, including possible diversion to other facilities to accept rejected loads and options to return to supplier.	5	1.6	• Rejection of wastes and implementation of contingency plan.	Management team to negotiate supplier policy and contingency plan Plant Operator (weighbridge) to record quantity of waste accepted daily. Site Supervisor to decide if waste should be rejected and whether it should be returned to supplier, sent to another licensed waste facility or disposed of direct to landfill.
	Delivery of dusty waste	R2, R7, R9, R13 and R15	3	4	12	• Plant Operator (Weighbridge) to identify dusty waste. Load to be dampened prior to and during tipping. • Plant operator to identify delivered dusty waste at point of tipping. Dusty waste to be treated with water, isolated or loaded for onward transport to offsite disposal facility.	5	2.4	• Dusty waste to be rejected at the weighbridge. • Dusty waste rejected upon discharge will be immediately sprayed with water. •	Plant Operator to ensure relevant checks are carried out during waste receipt. Site Supervisor to ensure waste acceptance procedures followed and relevant corrective action taken.
	Plant and equipment malfunction / breakdown	R2, R7, R9, R13 and R15	2	4	8	• Planned preventative maintenance and regular inspections. • Availability of maintenance operatives. Therefore, could be on site within a few hours. • Stand by parts / equipment may be available	5	1.6	• Repairs to be undertaken as quickly as possible. •	Site Manager to ensure plant / equipment is repaired as quickly as possible
	Unusual weather conditions e.g., extreme atmospheric temperature, extreme wind turbulence	R2, R7, R9, R13 and R15	3	4	12	• Meteorological information / forecasts received from the Met Office. • Job planning to mitigate the impact of unusual weather conditions.	5	2.4	• Monitor dust emissions using site procedures. • Review site procedures in relation to weather conditions to establish if modification will mitigate dust emissions. • Waste deliveries to cease in dry, high wind conditions if dust control cannot be achieved.	Site Supervisor to ensure meteorological information / forecast is reviewed daily. Site Supervisor to exercise monitoring procedures.

Appendix D Example Dust Monitoring Check Sheet

DUST MONITORING CHECK SHEET			
DATE		Time	
Name		Signature	
WEATHER CONDITIONS			
Wind Direction		Wind Speed	
Other conditions (sun, rain, etc			

BOUNDARY SITE CHECKS

Monitoring Pt	Time	Visible Dust (Y/N)	Operations Taking Place	Known Issues
1				
2				
3				
4				
5				
6				

COMPLAINTS – LOG ANY COMPLAINTS RECIEVED

Complainant	Time of Complaint	Distance and Direction from Site	Details

CORRECTIVE ACTION TAKEN

Issue	Immediate Action Taken	Action Effective (Y/N)	Further Action Required

Appendix E Trigger Values and Controls

Trigger	Frequency	Trigger Measure	Responsible	Control/Contingency Measure
Site Inspection	Daily – actions taken same day	Mud or litter on internal /access road	Site Manager	• Mobilise the road sweeper
		Material overflowing the ATRF / OWC reception areas		• Material to be moved back into storage area by site mobile plant; • If material can't be processed (e.g., breakdown) then temporarily suspend waste acceptance
		Spillage evident in yard		• Identify source and nature of spillage • Mobilise the road sweeper for mud/litter spillage • Utilise spills kit to contain and remove liquid spillage
		Water accumulation in yard		• Check drains and silt drop-out chambers for signs of build-up / blockage • Arrange for drain cleaning using gully washer or similar
		Residue/outputs overflowing the storage area		• Use mobile plant to move into correct storage area • Arrange for removal of material from site to end destination • If material can't be removed in timely manner consideration of temporarily ceasing waste acceptance for further treatment,
		Build-up evident in the ATRF or OWC process		• Processing to be stopped and if necessary, waste acceptance to be temporarily ceased to allow the process train to be drained and cleaned.
Meteorological Monitoring	Wind speed	> 25 mph (>11 m/s)	Site Manager	• If wind speed increases then consideration will be given to cessation of relevant site activities (e.g., loading and discharge). • In the event that temperature increases above defined level then additional checks will be undertaken on incoming waste stockpiles with portable PID analyser to check for fugitive releases of organics – materials to be placed under cover if results are indicative of unacceptable vapour release. • In the event of dry and windy conditions water suppression to be employed.
	Temperature	> 25OC		
	Rain	No		
Complaints Monitoring	As received	Response to complaint	Site Manager	• Immediate checks around the process to be undertaken to determine if source is located on site – using PID if necessary, dependent on the nature of the odour in response to individual complaints. • Offsite sniff checks at complainant location and other appropriate receptors. • Complaints to be reviewed monthly for adverse trends. • Introduction of odour diaries with community receptors in the event of prolonged odour nuisance in order to establish pattern/source
Quantitative Monitoring	TBC	Period of prolonged and justified complaints	Site Manager	• In the event of prolonged, justified dust complaints quantitative monitoring will be implemented in line with a programme agreed with the regulator. • Directional dust deposit monitoring will be implemented if the assessment level of 200 mg/m2/day is repeatedly exceeded