ISOPLETH

DAY GROUP LTD

Health, Safety & Environment

Dust Management Plan (Avonmouth)

Document Control

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Version 1	October 2017		Document created
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Version 3	December 2018	MN	Update of format and Section 3.0 Routine Controls
Version 4	April 2023	MC	Updated to reflect permit variation for increased annual throughput.

CONTENTS

1 Introduction

This Dust Management Plan (DMP) relates to the Avonmouth Incinerator Bottom Ash (IBA) recycling facility, near Bristol, hereinafter referred to as "the depot". The site is operated by Day Group Ltd.

The Day Group handles over five million tonnes of construction material each year, as well as providing services to the construction, demolition and water treatment industries. The company is certified to ISO9001 for Quality Management and ISO 14001 for Environmental Management and operates two other IBA recycling facilities in the UK
The scope of this DMP is limited to matters relating to dust.

1.1 Requirement and Approach

Version 1 of this DMP was prepared as part of the application for an Environmental Permit to cover the Depot operations and responsibilities. It has since been updated to reflect subsequent permit variations for increases in annual throughput.

This DMP has been prepared in accordance with the requirements of current guidance for such (or similar) facilities, including:

- EA Guidance TGN M17 monitoring of particulate matter in ambient air around waste facilities (v2 July 2013);
- Environment Agency Technical Guidance Note (Monitoring) M15 July 2012 Version 2
- IAQM (2014) '*Guidance on the assessment of dust from demolition and construction'*;
- IAQM (2012) '*Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites'*;
- Environment Agency. *Technical Guidance Note (Monitoring) M8 Monitoring Ambient Air*. Version 2, May 2011;
- Environment Agency. *Technical Guidance Note (Monitoring) M15* July 2012. Version 2;
- IAQM (2016) *Guidance on the Assessment of Mineral Dust Impacts for Planning* (v1.1); and
- Greater London Authority. *The Control Of Dust And Emissions During Construction And Demolition.* Supplementary Planning Guidance, July 2014.

The DMP is consistent with the contents of the Environment Agency Dust & Particulate Emission Management Plan template, which requires a description of receptors, operations, dust management, dust monitoring, actions and reporting.

1.2 Status

The DMP is intended to be a live document which serves as a reference during daily operations, and as such will be updated on a more frequent basis should the following occur:

- significant changes are made to the plant or operational practices;
- the Regulator requests that the DMP is updated; or
- complaints are received, which on subsequent investigation result in the identification of further control measures or remedial action, in addition to those set out within this DMP.

2 Site Details

2.1 Site Location

The depot is located at the former CWS Flour Mills site at the Royal Edward Docks in Avonmouth, Bristol. The Royal Edward Dock (also known as Avonmouth Dock), is the northernmost and largest of three docks in the area.

The depot is located approximately 6 miles north-west of the City of Bristol. The facility occupies an area of land approximately 1.6 Ha in area. The site location and setting can be seen in Appendix A.

The nearest neighbouring receptors that could be adversely affected by dust emissions from the IBA facility are:

- Industrial development within 50m of the IBA recycling facility boundary;
- Residential development at King Street, approximately 50m south east of the proposed development boundary at its closest point and further from potential dust sources as seen in Appendix B.

The receptor sensitivity (which the IAQM states is consistent for both dust and odour) is shown below:

For the sensitivity of people to odour, the IAQM recommends that the Air Quality Practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the following general principles:

High sensitivity receptor	Surrounding land where: • users can reasonably expect enjoyment of a high level of amenity; and • people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium sensitivity receptor	Surrounding land where: • users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or • people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
Low sensitivity receptor	Surrounding land where: • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads.

[source: IAQM]

2.2 Operations

The details of the IBA plant, including a process flow diagram and a site layout plan are shown in Appendix C and D.
Photo 1: IBA Reception / Maturation Building

Day Group Ltd is permitted to carry out recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day involving the treatment of slags and ashes. The site has a permitted throughput of 160,000 tonnes per annum and a maximum storage capacity of 10,000 tonnes of raw IBA. Day Group have applied to vary the permit to allow an annual throughput of 200,000 tonnes per annum with a maximum of 14,000 tonnes of raw IBA stored on site at any one time.

The incoming ash is damp on arrival as a result of the quenching process at source, with a moisture content of ~18%. The IBA is delivered in covered lorries. Further to inspection of the load, and quarantine where appropriate, the delivered material is tipped in the covered IBA reception building and subsequently stacked in windrows. The IBA acceptance and quarantine procedure is included as Appendix E.

The formation of windrows of IBA material allows maximum air exposure to promote the “ageing” or maturation process that initially takes place over a 3-4 week period before processing. This process allows hydration and carbonation reactions to occur taking up the high moisture level and making the ash more stable, easier to process and suitable for use. During maturation a crust forms on the exposed surfaces of the windrows reducing the risk of dust in dry conditions.

During dry weather water is sprayed over the stockpiles to promote the ageing process. The ageing process is exothermic and results in stockpiles heating up to about 70 degrees C, giving rise to steam being produced during processing on cold days.

IBAA and metals processing involves a number of stages including:

- Removal of oversize materials through the trommel screen for reprocessing at alternative facilities. Larger pieces of metal are also removed at this stage through a picking station;
- Removal of ferrous metals which are sent for re-processing off site;
- Screening to separate the material into four sizes to optimise efficiency of ferrous and non ferrous metal recovery – 0-4mm, 4-12mm, 12-32mm and +32mm;

- Non Ferrous metal recovery over eddy current separators. The non-ferrous metal is then sent off site for off-site reprocessing;
- The resulting IBAA product is then in three grades: < 4mm, 4-12mm and 4 – 32mm. These are re-blended together to meet the required grading for the product specification as a sub-base material.

Photo 2: Enclosed waste treatment and covered conveyors

The process flow diagram and site layout are shown in Appendix C and D.

2.3 Hours of Operation

The facility is manned from between 07.00 to 19.00 hours Monday to Friday; and 07.00 to 13.00 on Saturdays during which time most operations will take place. There may be occasions that it is necessary to receive and stockpile IBA outside of these hours during which the facility will be adequately supervised.

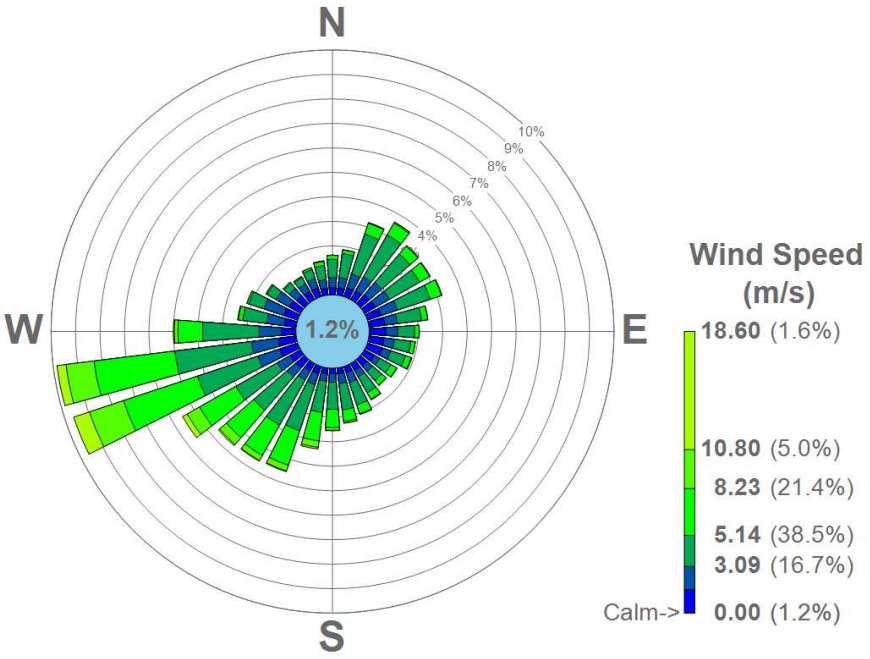
2.4 Topography

The surrounding area within the modelling grid is largely flat lying between approximately 0m AOD (i.e. the estuary) and 8.5m AOD.

2.5 Climate Data

A windrose for Filton for the period 2012 to 2016 (inclusive), providing the frequency of wind speed and direction, is presented below. The Met Office commentary states: "*At Avonmouth, the relatively high frequency of NE winds (and lack of SE and NW winds) reflects its situation on the Bristol Channel, aligned NE-SW. East or north east winds can also be strong if depressions pass along the English Channel*".

Figure 2.1
Windrose for Filton Observing Station (2012 – 2016)



2.6 Risk

A risk assessment was carried out in support of the planning application for the site:

> *Isopleth Ltd. Avonmouth IBA Recycling Facility. Dust Risk Assessment. April 2016 Report Ref: 01.0006.002/DRA v3*

The assessment (included as Appendix L) considered the proposal for 130,000 tonnes per annum and 10,000 tonnes stored in the IBA building. It considered the environment, location and site operations, including:

- the activities being undertaken (number of vehicles and plant etc.);
- the duration of these activities;
- the size of the site;
- the meteorological conditions (wind speed, direction and rainfall);
- the proximity of receptors to the activities;
- the adequacy of the mitigation measures applied to reduce or eliminate dust; and

- the sensitivity of the receptors to dust.

The permit was varied in 2018 to increase the annual throughput to 160,000 tonnes. The DRA was not re-assesssed as the uplift in tonnage did not change the storage arrangements, or the plant running speed or hours.

The assessment has been reviewed in April 2023 and remains relevant with the following notes on changing conditions:

- Section 2.4.3 states that for Grid reference 351500 / 178500 in 2016 the total annual mean concentration of PM10 was 17.56µg/m^3 and PM2.5 was 11.37µg/m^3. It states that using the IAQM guidance, where there is high receptor sensitivy, an annual mean PM10 concentration <24 µg/m3, with 10-100 receptors less than 100m of the site boundary, that the area should be considered a low sensitivity area. The corresponding 2022 data shows the annual mean concentration of PM10 has reduced to 13.64µg/m^3 and PM2.5 has reduced to 8.36 µg/m^3. This suggestes that the sensitivity of the area has reduced, whilst the IBA recycling plant has been operational, processing up to 167,000 tonnes per annum in 2022.
- Appendices B and C to the DRA, Site Layout and Elevations of the IBA storage building, both show measurements of windrows to accommodate 14,000 tonnes of IBA within the building, therefore no additional control measures are required for the storage of IBA.
- Section 5.3.1 states that vehicles leaving the depot onto Kings Road means properties on King Street shall not be affected by dust track out. This remains the case for the increased number of vehicle movements as the access and route out of the depot and the Docks remains the same. The additional 40,000 tonnes per annum divided by 5.5 working days for 50 weeks of the year leads to an additional 6 vehicle movements per working day. Control measures to prevent dust track out are detailed in section 3 of this DMP.
- The rubber curtain initially fitted to the open end of the IBA storage building was removed in 2018 due to Health and Safety concerns in strong winds. There has been no additional dust release as a result.
- Dust monitoring using deposition discs was regularly showing significant levels of dust entering the depot with no significant difference between the upwind and downwind results. Observation by Day Group staff and EA Officers has noted that at times visible clouds of dust blow across the depot from other locations within Avonmouth Docks. These instances can be seen on the TSP live monitoring records, therefore use of the deposition discs has been ended.

3 Routine Controls

A range of routine mitigation/control measures are used day-to-day under normal operating conditions in the absence of any unusual risk factors. Examples of routine control measures include receipt, inspection, acceptance/rejection of materials, storage, containment, handling, treatment and timing of activities.

The control measures for the depot can be defined as preventative (engineering) controls, where a process has been designed to minimise dust, management controls, where actions can be taken to control dust and direct control (i.e. mitigation of dust release).

3.1 Prevention

Controls designed into the depot infrastructure include:

- IBA tipping, storage/ maturation and loading feed hopper and storage of separated ferrous fractions in a 3-sided building;
- The open end of the IBA storage building faces North West to avoid prevailing winds;
- Processing of IBA within enclosed buildings;
- Transfer via covered conveyors;
- Collection of Non-Ferrous fractions via automatic weighed bagging system;
- Site surface fully concreted to allow ease of cleaning;
- IBAA fractions stored in three sided bays with partial cover;
- IBAA discharge conveyors fitted with rubber chutes and mist halos;
- Depot-wide water based dust suppression system installed;
- Wheel wash before exit weighbridge for all HGV traffic leaving the depot;
- Vehicle wash bay with pressure washer to maintain clean mobile plant and HGVs.
- Three water supplies provide security of supply; mains, rainwater harvesting, and a brackish water abstraction borehole.
- The depot had a vapour extraction system fitted above the primary feed hopper in the IBA storage building and the trommel building but this has deteriorated quickly and the dry scrubber has been prone to blockage due the high moisture content combined with fine dust. Therefore Day Group are commissioning a dust and vapour extraction system drawing potentially dusty air in from above the feed hopper in the IBA building and the buildings housing the trommel, 0-4mm process line and Overband Magnet Number 1 (OB1). The air will be drawn through a wet scrubber for dust and vapour removal and clean air vented above. Solid residues are collected and returned to the and IBA stockpile. The buildings are operated at atmospheric pressure and therefore the Waste Incineration BAT26 requirement to monitor emissions is not applicable.

3.2 Management controls

Routine management actions taken to prevent, or minimise the generation od ust include:

- Dust suppression system on all potentially dusty areas and materials;
- Dedicated team assigned to daily cleaning and maintenance of the plant and yard areas inaccessible to the road sweeper;
- Subcontract road sweeper engaged daily to clean all roads and accessible yard areas;
- Speed limit on internal haul routes; and
- Adequate water supply maintained.

The IBA is delivered damp after quenching at the EFW and forms a crust on the surface as it matures. Day Group regularly tests the physical parameters of the received IBA, including water content. This ensures that the imported material is suitable for treatement and informs whether additional water is required to facilitate the maturation process. The moisture content of the IBAA is also monitored and additional water added if necessary to prevent dust release.

The moisture content is checked visually by analysing the colour and the consistency in addition to being checked by hand to assess the physical nature of the IBA. Accurate Daily Moisture content records are established by comparing weights of oven dried samples against similar non-dried material.

A flexible, proactive approach is central to effective site management. This facilitates high standards without prescriptive controls. Consequently, the site manager is empowered to use available methods as seen fit to control potential dust emissions from IBA processing at the Avonmouth site.

An organisational chart of site management and also the management structure of the Day Group is included as Appendix F.

A daily briefing will take place, which will not only ensure that each member of staff is aware of their responsibilities on that day, but also include environmental risk, for example weather or site conditions leading to increased risk of dust, IBA and product stock and sales to inform management of stockpile heights. This is included as Appendix G.

3.3 Direct Control

The dust suppression will operate via the onsite pumping systems. There are three pumps in total each, service and stand by, designed to automatically activate should there be a mechanical failure. Furthermore, the system is linked to a diesel generator which will automatically start in the event of a mains power failure.

All of the equipment is subject to a detailed maintenance programme and spares for each of the components will also be held on site. As there are multiple sources of water and multiple pump units, the potential for total failure of the suppression system is low. The system will be used whenever there is no rain on site and there is a risk of dust arising.

In the event of failure of one part of the suppression system, activities will be limited in that area. In the unlikely event of total failure, activities will be ceased until at least one part of the suppression system is fixed.

Should there be any unacceptable fugitive emissions of dust the relevant part of the processing plant (or vehicle movements in the affected yard/ road) shall be shut down until normal operation can be resumed, either by repairs to plant or vehicles, damping down of dusty surfaces or cleaning. Emissions of dust leaving the depot boundary shall be notified to the Environment Agency in accordance with the permit conditions.

A drawing of the water suppression system is included as appendix H.

3.4 Control Outside Normal Operational Hours

The yard is swept at the end of each working day.

The dust suppression systems are automatically controlled via a HYDROVAR pump-mounted variable speed, microprocessor-based system controller giving control, 24 hours per day, 7 days per week.

4 Monitoring

4.1 Aims

The primary aim of the monitoring is to provide the operator / contractor with an ongoing qualitative and quantitative measure of the effectiveness of the mitigation measures employed at the site. Where monitoring indicates that mitigation is not as effective as desired, the responsible person must ensure that the measures described in the action plan (chapter 7 of this document) are taken.

Monitoring therefore takes three forms:

1. Monitoring of the conditions which may lead to dust release (i.e. 'source');
2. Monitoring of the weather conditions which may lead to dust impacts at receptors (i.e. 'pathway'); and
3. Monitoring of the dust itself along (and outside, if necessary) the site boundary ('receptor').

These are described in more detail below.

4.2 Weather Station

The site uses a Skyview weather station with 2 monitoring locations to record the following parameters:

- Wind Speed
- Wind Direction
- Temperature
- Due Point
- Humidity
- Barometric Pressure
- Precipitation

The data is logged at a frequency of 15 minute intervals and records are available for review as required. This data is particularly valuable when investigating allegations of dust annoyance.

A drawing of the weather monitoring locations has been included as appendix I. There are two weather monitoring locations.

- Main Weather Station: Mounted on pole from landing of meeting room access stairway, to measure wind speed & direction, temperature, humidity, wind chill, dew point, rainfall, barometric pressure and forecast.
- Additional Weather Station: Mounted on lighting pole, to measure wind speed & direction only.

This ensures that the influence of the IBA building on local wind patterns as they would affect dust dispersion is known.

4.3 Daily Checks: Visual Monitoring

The IAQM Dust monitoring guidance highlights the value of visual dust monitoring. It advises that an inspection for visible dust emissions in the vicinity of the site boundary (internal and external) should be conducted at least once on each working day:

> *Visual monitoring is likely to involve observation of dust deposition onto a surface and dispersion on and off-site. Whilst such observations are necessarily influenced by subjective opinion, the approach is simple to implement, and can be used effectively to minimise problems occurring. The monitoring involves observing both the conditions likely to lead to dust release (weather and nature of construction activity) in addition to the observation of any effects. Visual monitoring for dust will therefore also include perception of the potential for dust release and be associated with procedures likely to be described in a Dust Management Plan (DMP) or Construction Environmental Management Plan (CEMP) for the site. Observations should always be recorded in a site log.*

Twice daily dust checks are completed and logged on the Daily Environmental Log included in Appendix J. The checks relate to the conditions which may lead to dust release as well as monitoring of the dust itself along and outside, the site boundary. A windsock provides an additional visual guide as to the wind strength and direction.

The site staff responsible for this monitoring undertake this daily inspection and record the results. The inspection focuses on the following areas:

- Monitoring for weather and operational conditions likely to increase the risk of dust release;
- Visual assessment of any dust release; and
- Monitoring of any visible surface soiling.

The results of these inspections will be recorded in the Daily Environmental Log.

4.4 Quantitative Monitoring

Quantitative dust monitoring is undertaken at this site comprising real-time monitoring of Total Suspended Particulate (TSP).

A drawing of the TSP monitoring locations has been included as appendix I. These locations are consistent with EA Guidance TGN M8 and TGN M17 in that they address all of the following considerations:

- Sensitive receptors: The location of residences in particular;
- Multiple monitoring locations: To ensure that dust is monitored irrespective of direction;
- Prevailing wind: monitoring locations sited in locations which takes account of dominant winds;
- Distance from source: monitoring focussed on the closest residences;
- Upwind–downwind comparisons: to enable the background contribution to be calculated;
- Interfering sources: such as the other industries in the docks area;

- Obstructions: particularly the large maturation building;
- Accessibility: to allow access for servicing and collecting of data, where relevant; and
- Services: electricity supply.

4.4.1 TSP

There are a total of 2 No. TSI Environmental DustTrak DRX Aerosol Monitors installed at the site. A technical data sheet for these units is included as Appendix K and their locations are shown in Appendix I. These real-time monitors are logged and allow assessment of suspended dust concentration (including PM_{10} and $PM_{2.5}$). These are located at opposite sides of the site to ensure that any dust blowing in the direction of the closest receptors is detected and the relative site contribution may also be calculated.

A general PM_{10} site action concentration of **250 µg/m^3 averaged over a 15-minute period** is consistent with IAQM and GLA Guidance for construction sites and has been applied at the Avonmouth IBA Treatment facility.

A control level of 75 ug/m^3 is also appropraite as a 1-hour mean having subtracted background concentrations (to account for regional pollution episodes etc). A 1-hour mean of 50 ug/m^3 from local sources is equivalent to a 15 min mean of 200 ug/m^3 and would be a compromise, taking into account the longer averaging period.]

In addition to this site action concentration, summaries of 24-hour and annual averages are retained on site to allow comparison against UK air quality objectives as shown below.

PM fraction	Averaging period	Objectives/ Limit Value	Max allowable exceedences	Target Date
PM_{10}	24 hours	50 µg/m^3	35 times per calendar year	-
	Annual	40 µg/m^3		-
$PM_{2.5}$	Annual	Target of 15% reduction in concentrations at urban background locations		Between 2010 and 2020
		Variable target of up to 20% reduction in concentrations at urban background locations		Between 2010 and 2020
	Annual	25 µg/m^3		01.01.2020
		25 µg/m^3		01.01.2015

[source: GLA Construction Dust SPG]

The TSI Environmental DustTrak DRX Aerosol Monitors are serviced and calibrated in accordance with manufacturers guidelines and calibration certificates retained on site.

5 Abnormal Cconditions and Additional Controls

The operational control of the site is undertaken in anticipation of reasonably foreseeable dust-related incidents and accidents. These may include, abnormal situations, spillages, power failure, breakdown of doors and equipment.

Problem	Cause	Response	Timescale
Abnormally high wind (greater than Beaufort 6, strong breeze, 25mph)	Exceptional weather conditions	Restrict operations (if appropriate) and deploy dust suppression	Dynamic – Monitor weather conditions
Major change in dust emission rates or dust profiles	Significant alteration to feedstock or process	Evaluate dust potential and revise site operating procedures and control measures as appropriate	1 Hour
Accidental release due to accident or carelessness	Major spillage of IBA / IBAA	Make safe as necessary, clear up as quickly as possible and review operating procedures	Immediate
Inability to move stockpiles can't move imported material.	Break down of mobile plant	No impact on dust. Repair or hire in plant.	24 Hours
Inability to process IBA material	Break down of plant	No impact on dust - aim to repair plant as soon as practicable	48 Hours
Water supply for dust suppression restricted or system inactive	Pump or water supply failure	Restrict operations (if appropriate) and use alternative water supply.	4 Hours

The risk in the event of abnormal conditions depend on the weather conditions at that time. For example, a spillage of IBA or IBAA during a sustained period of wet weather will not give rise to a dust risk. In summer, the risk will be higher.

Specific issues are detailed in the sections below.

5.1 Loss of Power Supply

The dust suppression will operate via the onsite pumping systems. There are three pumps in total each, service and stand by, designed to automatically activate should there be a mechanical failure. Furthermore, the system is linked to a diesel generator which will automatically start in the event of a mains power failure.

5.2 Freezing Temperatures

The system incorporates automatic and manual drain down valves to protect against frost damage.

6 Roles and Responsibilities

A list of roles and responsibilities is set out in the Environmental Management Plan for the depot.

7 Action Plan

7.1 Complaints

The Company will maintain a register of all complaints recieved. In all cases the Site Manager will ensure that all complaints are effectively dealt with. The purpose of this procedure is to: ensure the effective management of complaints; to instigate the investigation of complaints; and implement corrective action and preventive measures to avoid reoccurrence.

Each complaint shall be entered on the Company's Environmental Power App, a bespoke application for recording environmental near miss, incidents and complaints. The following details shall be entered onto the app:

- Details of the originator of the complaint
- The date and time of the complaint (if the complaint is forwarded through a third party, details of the original complaint and the third party shall be entered, if available)
- The location of the complaint
- The nature of the complaint
- Details of the investigation into the complaint
- Corrective and preventative measures to be undertaken where necessary

All complaints and environmental incidents logged on the Environmental Power App are assigned to an individual (typically the Depot Manager) and automatically notified to the relevant Director and the Group Head of Health, Safety and Environment.

7.2 Investigation and Resolution of Complaints

The complaint shall be investigated and recorded within 4 hours during normal operating hours or 36 hours outside of normal hours, after the complaint has been received. Once the investigation has been carried out, the manager handling the complaint will contact the originator of the complaint and provide feedback on their findings and also the nature of any corrective action proposed.

The Depot Manager will endeavour to visit the area where the dust has been reported in order to ascertain the severity of the complaint, to identify the source and resolve any issues identified.

The site is regulated by the EA and all complaints should go through to the EA 24hr Hotline 0800 807060. Contact details are also on the information board located at the site entrance.

7.3 Site Action (Control) levels

Site action levels are described in Section 4 of this DMP.

8 Reporting

No routing reporting of monitoring is required, although all records are held in the site office. This situation will be reviewed as necessary.

A monthly summary of the daily walk around mentioned in section 4.3 Reporting shall be compiled and can be accessible to all interest parties.