

Ravenhead Quarry Landfill

Environmental Risk Assessment (H1) – Appendix B Dust and Emission Management Plan

Booth Ventures Waste (North West) Limited

Report No. K0158-BLP-R-ENV-04-01 APP B

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1 Introduction

1.1 Background

This Dust and Emissions Management Plan (DEMP), prepared by ByrneLooby, supports a permit application at Ravenhead Quarry Landfill (the Site). The Site is currently an active quarry, operated by Booth Ventures Waste (North West) Limited (the Operator), excavating aggregate for the construction industry.

A copy of the DEMP will be included in the Site's Environmental Management System (EMS) held at the Site Office and all members of staff will have access to this document.

1.2 Site Summary

Ravenhead Quarry is located approximately 500m to the north of the M58 motorway, on the southwest boundary of Upholland, and is approximately 2.5 kilometres to the east of Skelmersdale at National Grid Reference (NGR) SD 5126 0479. Access is from the west off Chequer Lane.

The site is located within a semi-rural location with residential land to the southwest, northwest, north and northeast, and agricultural land use to the east and southeast. Ibstock Brick Works is located to the northwest and East Pimbo Industrial Estate to the southwest.

The site is currently an active quarry, operated by Booth Ventures Waste (North West) Limited, excavating aggregate for the construction industry. The quarrying operations currently occupy the southern end of the quarry, and the mineral processing operations occupy the northern end of the quarry. The whole site is part of the larger Ibstock Brick Works site, which is owned by Ibstock Brick Ltd.

1.3 Proposed Operations and Associated Assessment

The planning submission and this permit application propose to use of Qualifying Materials fill, as specified in The Landfill Tax (Qualifying Material) Order 2011 (as amended), to landfill the resultant void at Ravenhead Quarry. The infilling of the void will provide final restoration contours for the site to be commensurate with the surrounding land surface (as far as is reasonably practical).

In support of the restoration operations and to support sustainability, imported wastes with a recoverable composition will be processed to recover aggregates in accordance with the quality protocol approved by the Agency. It is anticipated that approximately 5% of the wastes imported will be suitable for processing (crushing and/or screening).

Suitable wastes will be stockpiled on a hardstanding pad (aggregate over lower permeability soil) located on the southwestern site boundary prior to treatment. When sufficient recoverable wastes have been stockpiled treatment will be undertaken periodically for short periods by mobile plant. Recovered aggregate will either be used onsite (e.g. for creation of roads and hardstanding areas) or exported and used in accordance with quality protocol (e.g. pipe bedding and highway sub base). The recovery of aggregates from imported wastes will cease when the final restoration of the quarry void is completed.

This DEMP forms a further review of the potential impact of fugitive dust, mud and debris that may arise as a result from operations at the Site while providing management controls for fugitive dust, mud and debris.

2 Potential Dust Emission Sources

2.1 On-Site Dust Emission Sources

The wastes to be received will include soils, construction and demolition wastes. Under certain environmental conditions, i.e. dry and windy, such wastes can present a risk of fugitive dust emissions during transit and deposition and following placement. Fugitive dust emissions can potentially arise from the following site activities:

- Vehicle movement to and from the site;
- Vehicles and plant movements within the site;
- The deposit of waste;
- Use of plant;
- Crushing and screening operations; and
- Deposited waste prior to capping / restoration.

Fugitive dust may present a dust nuisance to surrounding human receptors or cause an adverse impact if excessive deposits settle on sensitive habitats and smother sensitive plant life or surface water receptors as accumulated sediment.

2.2 Off-Site Sources

The Ravenhead Quarry forms part of the wider Ibstock brick works. The brick works, East Pimbo industrial estate located to the southwest and agricultural land to the south and east have the potential to generate dust.

Other sources of off-site dust emissions include the surrounding roads (M58, A577, Chequer Lane and Town Hill Road).

2.3 Control Measures for On-Site Dust Emissions

Dust emissions may result from vehicular movement and the placement of waste. The following procedures will be employed to restrict dust emissions from vehicle movements.

- Access and egress to the site will be via existing concreted roads. A combination of the distance travelled on the internal haul roads and the use of the existing wheel wash will ensure any accumulated mud will be removed prior to the vehicle leaving site. All trucks leaving the site will be directed through the wheel wash.
- Vehicle speed restrictions of 10 mph are enforced and traffic routed in order to minimise suspension of dust.
- No-idling of mobile plant (bulldozer and excavator) will be permitted, and plant will be switched off when not in use.
- All vehicles delivering waste will be securely sheeted. Instruction will be passed to waste suppliers to ensure vehicles are sheeted before they enter the site to prevent waste becoming a dust nuisance.
- A daily visual inspection will be made of the public highway and any mud on the road recorded.

- All site roads will be maintained and cleaned as necessary where visible dust or mud are present to minimise the accumulation of mud or dust. A road sweeper is available to continually clean the access roads and neighbouring public highways.
- Repairs will be made to surfaced roads or where potholes / low points are causing water or mud to accumulate.
- A tractor and bowser will be employed during dry periods for dust suppression. The tractor and bowser can be manoeuvred around the site and used where it is required i.e. area of deposition, stockpiles, dampening down the site access or general site.

The following procedures will be employed at the site to restrict dust emissions during deposit and placement of waste.

- Dusty wastes will be excluded.
- Site staff will enforce strict waste acceptance protocols to ensure non-conforming wastes are not accepted. Waste Acceptance Procedures are detailed in Report Reference: K0158-BLP-R-ENV-05-02.
- Drop heights will be limited when waste is being deposited.
- Consideration will also be given to meteorological conditions during waste placement.
- During dry conditions wastes and haul roads will be damped down utilising a tractor and bowser.
- Visual monitoring for dust emissions will be undertaken daily by the site staff and during the placement of waste. This will take account of the prevailing wind direction on the day. The results of the monitoring will be recorded in accordance with the Site's EMS, remedial measures employed to prevent dust emissions will also be recorded.
- Should a dust complaint be received, the Operators complaints procedure will be followed.

The following procedures will be employed at the Site to reduce and control mud or windblown dust on roads:

- The existing wheel wash will be utilised to ensure any accumulated mud will be removed prior to the vehicle leaving site.
- A road sweeper is available to continually clean the access road and neighbouring public highways.
- Site staff will be instructed to increase inspections if necessary (e.g. in wet conditions) to ensure that any mud being tracked onto the public highway can be rapidly identified and remedial action is taken as soon as is practicable.
- If mud on the road is observed to be an issue, use of vehicles will be temporarily halted until appropriate additional measures are implemented e.g. redirecting drivers through the wheel wash, employ road sweeper.

The following procedures will be employed at the Site to reduce and control windblown dust from the screener and crusher:

- Operating and maintaining crushing and screening plant and machinery to manufactures specifications.

- Ensure conveyors move at sufficient velocity to prevent material from being exposed to cross winds for sustained periods of time, but not so fast that material is ejected from the conveyor.
- Drop heights will be limited when waste is being deposited.
- Stockpile materials away from sensitive boundaries where possible. Stockpile heights restricted to minimise dust emissions. During dry periods, dampening of site stockpiles as necessary.
- Use of tractor and bowser when processing dry and friable materials or during dry conditions.
- Crusher and screener will only be operated periodically during operational hours dependent on available material.
- Visual monitoring for dust emissions will be undertaken daily by the site staff and during treatment. This will take account of the prevailing wind direction on the day. The results of the monitoring will be recorded in accordance with the Site's EMS, remedial measures employed to prevent dust emissions will also be recorded.
- Should a dust complaint be received, the Operators complaints procedure will be followed.

Dust monitoring will be undertaken in accordance with Section 6.

Implementation of the DEMP will be the responsibility of the Site Manager (or nominated deputy). It will form part of the Site's EMS and will therefore be part of the staff induction process ensuring staff competency. Training will be delivered by the Site Manager subject to internal audits of the current EMS. The DEMP will be subject to periodic review.

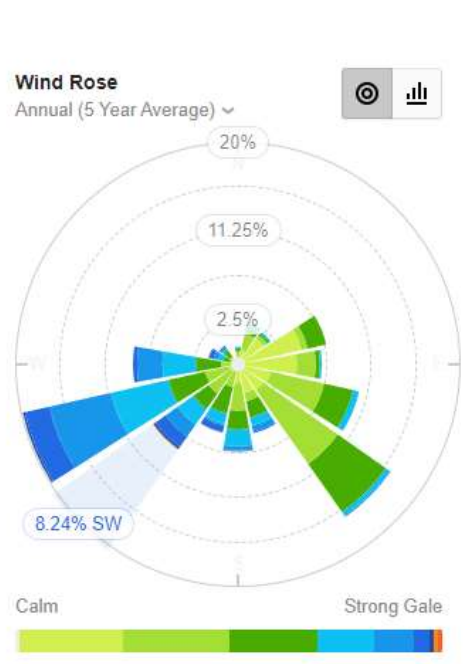
3 Potential Pathways

3.1.1 Airborne Pathways

The potential pathways for dust and particulates to reach sensitive receptors are via the air or over land, namely via the wind. Transit of airborne emissions will be determined by the prevailing wind direction and physical obstructions.

Weather and wind statistics are taken from Skelmersdale Weather Station¹ located 2.8 km northwest of the Site boundary. The windrose shows that the dominant wind direction is from the west southwest and southeast blowing towards the east northeast and northwest (Figure 1).

Figure 1 – Windrose, Skelmersdale



3.2 Overland Pathways

Overland pathways are limited to the suspended solids in water from the site and mud and debris on vehicles leaving the site. The uncontrolled flow of site surface water will be prevented by the use of ditches, swales, attenuation ponds and infiltration basins. All discharge water will be in accordance with the extant discharge consent to sewer. Following restoration clean surface water from restored vegetated areas will flow to infiltration basis or surface water sewer. Mud and debris on vehicles will be controlled in accordance with the procedures identifies in Section 2 above.

¹ [Skelmersdale Wind Forecast, Lancashire WN8 6 - WillyWeather](#)

4 Potential Sensitive Receptors

4.1 Receptor Locations

When identifying the receptors, the closest and the most sensitive (if different from the closest) have been considered in each direction from the hazard. Account has been taken of the mechanism of transport to the sensitive receptor e.g. proximity to highway access / egress points for mud and wind direction for airborne dust. Weather and wind statistics taken from Skelmersdale Weather have been used to establish hazard pathways to adjacent receptors.

Probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching the receptor i.e. frequency of prevailing wind in that direction. The probability of exposure is irrespective of the type of hazard presented.

Sensitive receptors within 1.5 km are listed in Table 1 below. The location of each sensitive receptor is indicated in drawing referenced ESID2 and ESID3.

The Environment Agency (Agency) guidance template² for dust management requires consideration to be given to the impact of dust emissions on receptors within a 1km of the site boundary. Although Table 1 identifies potential receptors within a greater distance beyond 1km from the site boundary.

A review of other local sources of dust and particulates has been completed and an assessment of each receptor type (in regard to sensitivity to dust) has been summarised in Table 2.

Table 1 Sensitive Receptor Review

Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
1	Residential properties on Miners View	Residential	120	W	6.7
2	Residential properties on Broadacre	Residential	10	ENE	17.5
3	Residential properties on Vale Croft	Residential	10	NE	8.2
4	Residential properties on Fieldview	Residential	25	NNE	5.5
5	Residential properties on Ravenhead Drive	Residential	35	N	6.9
6	Residential properties on Daybrook	Residential	200	NNW	5.6
7	Residential properties on Darfield	Residential	260	NW	14.8
8	Residential properties on Danbers	Residential	340	WNW	9.8
9	Residential properties on Tower Hill Road	Residential	150	S	1.4
10	Residential properties on Galloway Drive	Residential	270	E	8.3
11	Well Cross Farm (and kennels)	Residential / Farm	200	SE	1.8
12	Highview Pre-school	School	170	E	8.3
13	Playing Field	Recreation	45	S	1.4
14	Playing Field	Recreation	300	W	6.7
15	Chequer Lane Playing Fields	Recreation	460	WNW	9.8
16	Beacon Country Park	Recreation	740	NNW	5.6
17	Hope High School	School	700	WSW	7.2
18	Moorside Primary School	School	850	WNW	9.8
19	Holland Moor Primary School	School	840	NW	14.8
20	St Thomas the Martyr CoE Primary School	School	530	NE	8.2
21	Up Holland High School	School	1240	SE	1.8
22	Ibstock Brick Works	Industry	<10	NW	14.8

² [Control and monitor emissions for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit)

Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
23	East Pimbo Industrial Estate	Industry	570	SW	3.2
24	Best Western Lancashire Manor Hotel	Hotel	500	SW	3.2
25	Up Holland Benedictine Priory	Scheduled Monument	920	ENE	17.5
26	Upholland station	Station	870	SSW	3.3
27	Train line	Train line	800	S	1.4
28	Tower Hill Road	Road	135	SSE	0
29	Miners View	Road	150	W	6.7
30	Broadacre	Road	40	ENE	17.5
31	Vale Croft	Road	35	NE	8.2
32	Fieldview	Road	55	NNE	5.5
33	Ravenhead Drive	Road	55	N	6.9
34	Daybrook	Road	240	NW	14.6
35	Darfield	Road	300	NW	14.6
36	Danbers	Road	360	WNW	9.8
37	Chequer Lane	Road	270	W	6.7
38	M58 Motorway	Road	480	S	1.4
39	Public Footpath	Footpath	180	E	8.3
40	Public Footpath	Footpath	140	SW	3.2
41	Issues	Spring	590	ESE	2.8
42	Issues	Spring	960	E	8.3
43	Issues	Spring	1050	NE	8.2
44	Issues	Spring	830	NNW	5.6
45	Unnamed Pond	Pond	700	ESE	2.4
46	Unnamed Pond	Pond	510	WNW	9.8
47	Abbey Lakes	Lakes	1200	E	8.3
48	Dean Brook	Stream	1250	ENE	17.6
49	Unnamed drain	Drain	100	W	6.7
50	Unnamed drain	Drain	115	SSW	3.3
51	Unnamed drain	Drain	170	ESE	2.4
52	Unnamed drain	Drain	370	E	8.3
53	Unnamed drain	Drain	670	N	6.9
54	Ravenhead Quarry geological SSSI	SSSI	0	Surrounding Site	0 - 17.5
55	Pimbo Lane Pit	LWS	60	SE	1.8
56	A577	Road	570	W	6.7
57	Greenslate Water Meadows	LNR	1800	SE	1.8

Table 2 Types of Receptors

Receptor Type	Sensitivity to Dust
Habitats / Watercourses	High
Residential	High
Recreational	High
Commercial	High
Public Amenity	High
Public Highways / Railways / Footpaths	Moderate
Industrial / Agricultural	Low to Moderate

4.2 Receptor Types

4.2.1 Habitats and watercourse

Basic preapplication advice including a ‘Conservation & Heritage Screen’ (referenced: EPR/LB3107GH/A001) were provided by the Agency. It identified Ravenhead Quarry Site of Special Scientific Interest (SSSI) which is a geological SSSI within the quarry. Mitigation measures have been agreed with Natural England and incorporated within the restoration design to ensure the preservation of the geology of the SSSI. The screen also identified a Local Wildlife Site (LWS) Pimbo Lane Pit within 200m of the site.

No Ramsar, National / Local Nature Reserves, Special Areas of Conservation (SAC), Special Protection Areas (SPA), priority habitats, ancient woodland, priority species or Scheduled Monuments were identified in the Screen.

A number of watercourses and waterbodies have been identified around the Site including unnamed ponds at Chequer Lane Playing Fields and agricultural land to the west northwest, Abbey Lake to the east and Dean Brook to the east northeast.

Infilling and treatment activities are predominantly “below ground level” and are not expected to be significantly different from the current quarry extraction operations that have been undertaken at site for a number of years.

Fugitive dust is the emission most likely to affect adjacent habitats. The operator will ensure appropriate controls are in place during windy conditions to prevent dust spreading beyond the Site boundary. The operator may also restrict or suspend activities most likely to generate dust or refuse inputs that may contain excessive quantities of dusty material.

Uncontrolled fugitive dust is unlikely to affect adjacent habitats. In the unlikely event dust emissions were to occur, only the accumulation of very significant quantities of dust in the vegetation could inhibit normal plant growth or animal behaviour. Similarly, only significant quantities of dust in the watercourses / waterbodies could cause sedimentation.

4.2.2 Residential, recreational, commercial, industrial, and agricultural premises

The potential emissions from the site are likely to have an impact on persons occupying residential, recreational, commercial, industrial, or agricultural premises. Exposure to persons at commercial or industrial / agricultural premises may be lower than recreational and residential premises as they are more likely to be inside during the working day or they may be transient visitors to the premises. Certain industrial / agricultural premises may generate similar emissions to the site and the employees may be desensitised as a result.

Fine dust particulates will be able to travel further than larger particles that are more likely to settle on surfaces nearby. Finer particulates may elicit an unpleasant or harmful respiratory effect from sensitive individuals, whilst settlement of dust may be unsightly or damaging by smothering to sensitive flora. Dust is less likely to affect internal spaces however, a sustained source of fine suspended particulates may eventually permeate inside buildings.

The proposed permitted activities are unlikely to generate dust in sufficient quantities that a plume would be visible beyond the site boundary.

The closest residential properties are off Miners View, Broadacre, Vale Croft, Fieldview, Ravenhead Drive, Daybrook, Darfield and Danbers Road located to the southwest, northwest, north and northeast of the Site. In all instances the Site is separated from the receptors by vegetation including trees which may act as a barrier to dust.

For conservatism this DEMP assumes the residences are occupied during the operational hours of the site by members of the public most sensitive to emissions from the site. It is likely that the combination of waste type and operational controls, distance to the receptors and the prevailing wind direction prevent potential nuisance emissions from reaching receptors.

4.2.3 Highways, railways and footpaths

The transitory nature of highways, railways or footpaths means receptors using those locations will be exposed to potential emissions from the site for shorter (albeit variable) periods of time than residences or businesses. Pedestrians will have longer and more direct exposure to emissions compared to vehicle / train users who are less likely to be exposed to emissions and for significantly shorter periods of time.

Public footpaths are located to the east and southwest of site and a railway is located to the south. A number of roads surround the Site including the site access road (Chequer Lane) to the west, M58 to the South, A577 to the west and north, and Tower Hill Road to the east and south.

The primary concern for occupants of vehicles is accumulation of mud on the road which may represent a driving hazard with loss of traction in wet or very dry conditions. If mud or other material were to be tracked from the Site, it would most likely accumulate on Chequer Lane near the Site entrance access road. The Operator will put operational controls in place to minimise the risk of mud on roads from the Site, i.e. employment of road sweeper.

5 Dust Risk Assessment and Management Plan

Specific risk assessments have been completed for fugitive dust, and mud & debris, and are contained in Tables 3 and 4. The pathway for dust is determined by the location of the receptor relative to the Site, distance from the Site boundary (m) and the frequency (likelihood) the prevailing wind will blow in the direction of the receptor (%), as determined by weather data. The pathway for mud and debris is determined by the location of the receptor relative to the Site (m), the frequency of use of the local road network to and from the Site by vehicles and meteorological conditions which affect the mobility of mud and debris.

The risk assessment tables represent the risk of exposure to the hazard before mitigating controls are put in place. The probability of exposure is therefore not necessarily a reflection of the severity of the impact on the receptor, which may not be sensitive to the hazard. The severity of the unmitigated consequence presumes the receptor has been exposed to the hazard. However, if the receptor is unlikely to be exposed, then the overall unmitigated risk is low and vice versa. The mitigated risk is the residual risk presented by the hazard after control measures have been instigated. This is the most realistic representation of the risk as it is extremely likely that controls will be maintained.

Table 3 Dust Fugitive Emission Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Residual Risk
	No.	Dist.	Direc.	Freq					
Dust through air from: vehicle movements or deposit of wastes	1	120	W	6.7	High – close proximity to Site, occasionally downwind	High – residential receptor	High	<p>No excessively dusty wastes to be accepted at the site.</p> <p>Infilling and treatment is predominantly below ground surface, which further mitigates against emissions</p> <p>On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust.</p> <p>Dampening of site roads / surfaces / stockpiles / material prior to processing as necessary using a tanker during dry periods.</p> <p>Weighbridge will conduct assessment of waste inputs and impose controls and restriction on potentially dusty waste (e.g. rapid cover following placement, refusal to tip).</p> <p>Daily visual inspection by appropriate site staff at suitable locations taking account of the prevailing wind direction.</p> <p>All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance.</p>	Low
	2	10	ENE	17.5	High – close proximity to Site, frequently downwind	High – residential receptor	High		
	3	10	NE	8.2	High – close proximity to Site, occasionally downwind	High – residential receptor	High		
	4	25	NNE	5.5	High – close proximity to Site, infrequently downwind	High – residential receptor	High		
	5	35	N	6.9	High – close proximity to Site, occasionally downwind	High – residential receptor	High		
	6	200	NNW	5.6	High – close proximity to Site, infrequently downwind	High – residential receptor	High		
	7	260	NW	14.8	High – close proximity to Site, frequently downwind	High – residential receptor	High		
	8	340	WNW	9.8	High – close proximity to Site, occasionally downwind	High – residential receptor	High		
	9	150	S	1.4	High – close proximity to Site, infrequently downwind	High – residential receptor	High		
	10	270	E	8.3	High – close proximity to Site, , occasionally downwind	High – residential receptor	High		
	11	200	SE	1.8	High – close proximity to Site, infrequently downwind	High – residential receptor	High		
	12	170	E	8.3	High – close proximity to Site, occasionally downwind	High – school receptor	High		
	13	45	S	1.4	High – close proximity to Site, infrequently downwind	Medium – open space, dust nuisance	Medium		
	14	300	W	6.7	High – close proximity to Site, occasionally downwind	Medium – open space, dust nuisance	Medium		
	15	460	WNW	9.8	High – close proximity to Site, occasionally downwind	Medium – open space, dust nuisance	Medium		
	16	740	NNW	5.6	Medium – proximity to Site, infrequently downwind	Medium – open space, dust nuisance	Medium		
	17	700	WSW	7.2	Medium – proximity to Site, occasionally downwind	High – school receptor	Medium		
	18	850	WNW	9.8	Medium – proximity to Site, occasionally downwind	High – school receptor	Medium		
	19	840	NW	14.8	Medium – proximity to Site, frequently downwind	High – school receptor	Medium		
	20	530	NE	8.2	Medium – proximity to Site, , occasionally downwind	High – school receptor	Medium		

Hazard / Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Residual Risk
	No.	Dist.	Direc.	Freq					
	21	1240	SE	1.8	Low - distance from site, infrequently downwind	High - school receptor	Medium	A road sweeper will regularly clean site roads of any mud trailed on from site vehicles, this will limit further dust generation.	
	22	<10	NW	14.8	High - close proximity to sit, frequently downwind	Medium - industrial receptor	Medium		
	23	570	SW	3.2	Medium - proximity to Site, infrequently downwind	Medium - industrial receptor	Medium		
	24	500	SW	3.2	Medium - proximity to Site, infrequently downwind	High - hospitality receptor	Medium		
	25	920	ENE	17.5	Medium - proximity to Site, frequently downwind	Medium - dust nuisance to users	Medium		
	26	870	SSW	3.3	Medium - proximity to Site, infrequently downwind	High - station, transient dust nuisance	Medium		
	27	800	S	1.4	Medium - proximity to Site, infrequently downwind	Low - railway, transient dust nuisance	Medium		
	28	135	SSE	0	Medium - distance from site, infrequently downwind	Low - road, transient dust nuisance	Medium		
	29	150	W	6.7	High - close proximity to site, occasionally downwind	Low - road, transient dust nuisance	Medium		
	30	40	ENE	17.5	High - close proximity to site, frequently downwind	Low - road, transient dust nuisance	Medium		
	31	35	NE	8.2	High - close proximity to site, occasionally downwind	Low - road, transient dust nuisance	Medium		
	32	55	NNE	5.5	High - close proximity to site, infrequently downwind	Low - road, transient dust nuisance	Medium		
	33	55	N	6.9	High - close proximity to site, occasionally downwind	Low - road, transient dust nuisance	Medium		
	34	240	NW	14.6	High - close proximity to site, frequently downwind	Low - road, transient dust nuisance	Medium		
	35	300	NW	14.6	High - close proximity to site, frequently downwind	Low - road, transient dust nuisance	Medium		
	36	360	WNW	9.8	High - close proximity to site, occasionally downwind	Low - road, transient dust nuisance	Medium		
	37	270	W	6.7	High - close proximity to site, occasionally downwind	Low - road, transient dust nuisance	Medium		
	38	480	S	1.4	High - close proximity to site, infrequently downwind	Low - road, transient dust nuisance	Medium		
	39	180	E	8.3	High - close proximity to site, occasionally downwind	Medium - footpath, transient nuisance	Medium		
	40	140	SW	3.2	High - close proximity to site	Medium - footpath, transient nuisance	Medium		
	41	590	ESE	2.8	Medium - proximity to Site	Medium - potential sediment accumulation	Medium		

Hazard / Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Residual Risk
	No.	Dist.	Direc.	Freq					
	42	960	E	8.3	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	43	1050	NE	8.2	Low - distance from site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	44	830	NNW	5.6	Medium – proximity to Site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	45	700	ESE	2.4	Medium – proximity to Site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	46	510	WNW	9.8	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	47	1200	E	8.3	Low - distance from site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	48	1250	ENE	17.6	Low - distance from site, frequently downwind	Medium – potential sediment accumulation	Medium		
	49	100	W	6.7	High – close proximity to site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	50	115	SSW	3.3	High – close proximity to site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	51	170	ESE	2.4	High – close proximity to site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	52	370	E	8.3	High – close proximity to site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	53	670	N	6.9	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	54	0	Surrounding Site	0 – 17.5	High – close proximity to site, frequently downwind	Medium – dust nuisance to users	Medium		
	55	60	SE	1.8	High – close proximity to site, infrequently downwind	Medium – potential deposition on sensitive vegetation	Medium		
	56	570	W	6.7	Medium – proximity to Site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	57	1800	SE	1.8	Low – distance from Site, infrequently downwind	Medium – potential deposition on sensitive vegetation	Medium		

Table 4 Mud Fugitive Emission Risk Assessment and Management Plan

Hazard and Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Overall Risk
	No.	Dist.	Direc.	Freq					
Mud tracked from site onto public roads by associated site vehicles	1	120	W	6.7	High – connects to Chequer Lane	High - potential hazardous road conditions	High	<p>All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance.</p> <p>Site staff at the weighbridge and at the tipping face will be vigilant to excessive mud tracked from the site by visiting vehicles and site plant. Any vehicles observed to be carrying mud in their tyres will be directed back through the wheelwash until the wheels are clean before leaving site.</p> <p>A road sweeper will regularly clean the site haul roads and the adjacent shared access and public highway as necessary.</p> <p>Drivers will be reminded of their responsibility to maintain clean vehicles and not to track mud onto the public highway.</p>	Low
	2	10	ENE	17.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	3	10	NE	8.2	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	4	25	NNE	5.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	5	35	N	6.9	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	6	200	NNW	5.6	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	7	260	NW	14.8	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	8	340	WNW	9.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	9	150	S	1.4	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	10	270	E	8.3	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	11	200	SE	1.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	12	170	E	8.3	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	13	45	S	1.4	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	14	300	W	6.7	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	15	460	WNW	9.8	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	16	740	NNW	5.6	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	17	700	WSW	7.2	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	18	850	WNW	9.8	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	19	840	NW	14.8	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium		

Hazard and Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Overall Risk
	No.	Dist.	Direc.	Freq					
	20	530	NE	8.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium	Monitoring of shared access and appropriate maintenance will form part of the EMS for the site.	
	21	1240	SE	1.8	Low - no physical connection	High - potential hazardous road conditions	Low		
	22	<10	NW	14.8	High - connects to Chequer Lane	High - potential hazardous road conditions	High		
	23	570	SW	3.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	24	500	SW	3.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	25	920	ENE	17.5	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	26	870	SSW	3.3	Low - no physical connection	Station not at risk from mud entrainment on road	Low		
	27	800	S	1.4	Low - no physical connection	Railway not at risk from mud entrainment on road	Low		
	28	135	SSE	0	High - connects to Chequer Lane	High - potential hazardous road conditions	High		
	29	150	W	6.7	High - connects to Chequer Lane	High - potential hazardous road conditions	High		
	30	40	ENE	17.5	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	31	35	NE	8.2	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	32	55	NNE	5.5	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	33	55	N	6.9	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	34	240	NW	14.6	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	35	300	NW	14.6	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	36	360	WNW	9.8	High - connects to Chequer Lane	High - potential hazardous road conditions	High		
	37	270	W	6.7	High - Chequer Lane	High - potential hazardous road conditions	High		
	38	480	S	1.4	Medium - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	39	180	E	8.3	Low - no physical connection	Footpath not at risk from mud entrainment on road	Low		

Hazard and Pathway	Receptor				Probability	Consequence	Overall Risk	Risk Management	Overall Risk
	No.	Dist.	Direc.	Freq					
	40	140	SW	3.2	Low - no physical connection	Footpath not at risk from mud entrainment on road	Low		
	41	590	ESE	2.8	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	42	960	E	8.3	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	43	1050	NE	8.2	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	44	830	NNW	5.6	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	45	700	ESE	2.4	Low - no physical connection	Pond not at risk from mud entrainment on road	Low		
	46	510	WNW	9.8	Low - no physical connection	Pond not at risk from mud entrainment on road	Low		
	47	1200	E	8.3	Low - no physical connection	Lake not at risk from mud entrainment on road	Low		
	48	1250	ENE	17.6	Low - no physical connection	Stream not at risk from mud entrainment on road	Low		
	49	100	W	6.7	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	50	115	SSW	3.3	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	51	170	ESE	2.4	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	52	370	E	8.3	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	53	670	N	6.9	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	54	0	Surrounding Site	0 - 17.5	Low - no physical connection	SSSI not at risk from mud entrainment on road	Low		
	55	60	SE	1.8	Low - no physical connection	LWS not at risk from mud entrainment on road	Low		
	56	570	W	6.7	High - connects to Chequer Lane	High - potential hazardous road conditions	High		
	57	1800	SE	1.8	Low - no physical connection	Low - not at risk from mud entrainment on road	Low		

6 Community Engagement, Reporting and Contingencies

6.1 Overview

Prevention will be viewed as the most effective means of controlling dust before an adverse impact occurs from uncontrolled emissions. The Source → Pathway → Receptor model determined above allows for the identification of the critical control points where dust can arise, how it can travel to a receptor and the likely impact.

The performance of a DEMP will ultimately be judged by the impact of the landfill and treatment activities on the receptors. Should complaints be received, a procedure will be in place to effectively deal with the issue in a sensitive, efficient and auditable manner.

The controls for each potential dust source are detailed in previous sections of this report. The management of those controls will be based on the on-going monitoring regime on site. The monitoring regime can work as an early warning system against potential problems (e.g. meteorological monitoring) or a diagnostic tool to establish the cause of a dust event (e.g. perimeter monitoring).

6.2 Qualitative Monitoring

The Site Manager will be responsible for ensuring that regular visual inspections are made of the site and its perimeter in order to identify any sources of dust and to establish whether any dust has left the site. This will include dust arising from vehicles arriving at site and from the Site itself.

A dust assessment form will be completed for each inspection and all site personnel will be responsible for reporting dust problems as soon as practicable to the Site Manager or the next level of management if the Site Manager is not available.

The following locations will be targeted for dust monitoring by the site staff:

- Weighbridge or waste reception area (continuous monitoring of vehicles);
- Point of waste deposition; and
- Subject to prevailing wind direction (i.e. up and down wind), appropriate areas of the site perimeter.

The following information will be recorded during each round of monitoring:

- Date and time of assessment;
- Direction of prevailing wind;
- Wind speed (qualitative);
- Other meteorological conditions affecting likelihood of dust (e.g. rainfall, recent rainfall events and whether site surfaces are dry and dusty or wet);
- Location and type of active site activities not associated with the landfill installation (e.g. quarry blasting, quarry rock handling);
- Frequency of vehicle movements, and vehicle speeds (qualitative);
- Condition of haul roads; and

- Other off-site sources of dust.

The Site Manager will be informed immediately of any findings of dust attributed to the site and will authorise remedial measures to be taken.

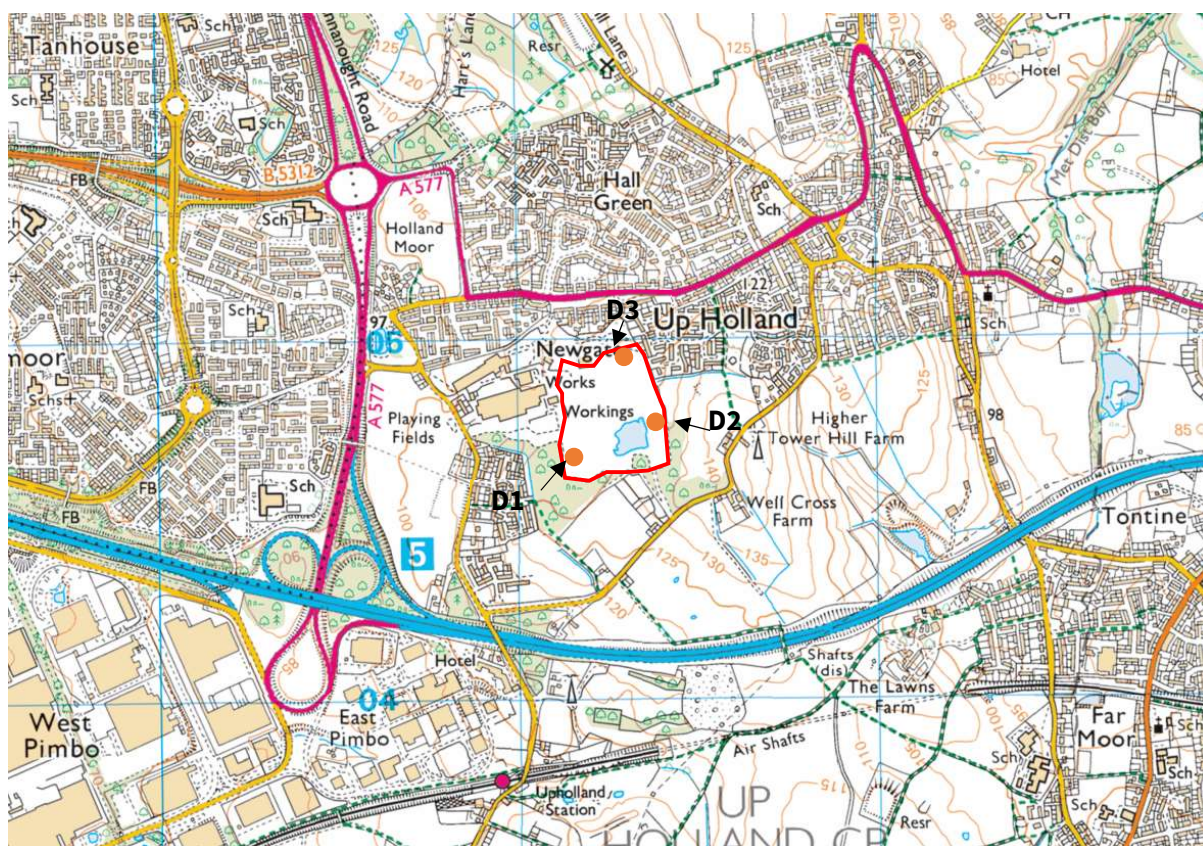
6.2.1 Quantitative Monitoring

In addition to the qualitative monitoring, quantitative monitoring through the use of deposited dust ‘frisbee’ gauges will also be undertaken at the Site on a quarterly basis for the first 12 months following issue of the Site’s permit. Monitoring will be undertaken at three points (D1 to D3) as shown on Figure 2. They will be positioned upwind and downwind of the landfill and soil treatment facility. D1 and D3 are also located nearest the closest residential receptors.

Deposited and directional dust is monitored using ‘frisbee’ deposition gauges in accordance with the method specified in the Environment Agency guidance document M17. Each gauge is analysed for total dust mass (mg), deposition rate (mg/m²/day), directional dust (8 compass points), and particulate characterisation (e.g. carbonaceous matter, silicon rich, general dirt, calcium rich etc.).

The Site Manager will be informed immediately of any findings of dust attributed to the site and will authorise remedial measures to be taken.

Figure 2 – Dust Location Points



Historic monitoring for total dust mass, deposition rate and directional dust has been undertaken at Ravenhead in 2016 and 2019. The most recent data is attached as Appendix B.

There is at present no national UK set limit for dust, Environment Agency guidance³ states gravimetric dustfall monitoring results generated by ‘frisbee’ gauges at sensitive receptors are usually compared with a “complaints likely” dust guideline of 200 mg/m²/day.

Directional dust deposition uses vertically orientated adhesive (sticky) strips. The degree of soiling of the exposed sticky strip is measured using a reflectance meter and expressed as the percentage Effective Area Coverage (%EAC) per day. At present there is no national UK set limit, Environment Agency guidance³ states it is common for monitoring programmes to use the 2.0% EAC per day “probable complaints” threshold as a guideline limit.

The latest results did not exceed the dust guideline of 200 mg/m²/day or the 2.0% EAC per day guideline. This demonstrates that dust is adequately controlled onsite.

Consideration has been given to PM₁₀ monitoring at the site, however as the site is adequately controlling dust it is proposed that quantitative dust monitoring will be used as a measure of good dust control and consequently reflective of PM₁₀ levels. The site is not located within a PM₁₀ Air Quality Management Area (AQMA), as shown on the Defra website⁴. The nearest sensitive receptor downwind of the proposed soil treatment area is greater than 250m. There is also potential for interference from background sources, such as the Ibstock Brick Works and agricultural land not operated by Booths. Consequently, monitoring for PM₁₀ is not proposed.

6.3 Complaints Process

Any complaints received at the Site or via the Regulatory Bodies including the Agency and Local Authority, will be recorded using the form in Appendix A.

This will instigate further visual dust monitoring at the location of the complaint and on-site to determine the extent and location of the dust generating materials and/or process will be identified. Where possible, as much information and detail about the complaint will be recorded, whether this is from the relevant authority or a complaint direct to the site. This information will assist in the investigation and determining the source of the dust e.g. differentiating between potential dust from the site or other off-site activities.

All complaints and queries will be logged in accordance with the Site’s EMS as soon as is practicably possible. All complaints logged will be subject to investigation, and complainants responded to within 48 hours of receipt, where possible. All responses will be through trained and experienced staff.

In the event that a substantiated dust complaint is received arising from the Site, additional monitoring will be undertaken at the nearest sensitive receptors. The person conducting the survey shall make note of any dust at each monitoring point including those not of obvious site origin.

Complaints regarding dust from the Site will be investigated in accordance with the protocol, and appropriate records maintained which may include:

- Complaints received including name and contact details of complainant (if known), and complainants description of the dust;

³ [NEW M17 TEXT \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)

⁴ [AQMA's interactive map \(defra.gov.uk\)](https://www.defra.gov.uk)

- Nature of problem including date, time, duration, prevailing weather conditions and cause of the problem;
- On-site activities and operational conditions at the time of the complaint;
- Records of the likely source of the dust, even if it is clearly not from the Site;
- Details on the corrective action taken and any subsequent changes to monitoring and operational procedures; and,
- The Agency will be proactively informed by the Operator of the complaint and the Operator will confirm to the best of its knowledge the information described above.

The Operator will ensure that the complainant has all the relevant contact details of the site (i.e. the Site Manager) and the officer responsible at the Agency. The operator will be in regular contact with the complainant and the Agency whilst the cause of the dust is being investigated and remediated.

An evaluation of the effectiveness of the techniques used will be carried out on completion of any remedial measures, or if the complaints persist. Records of the above will be retained by site for future reference.

6.4 Means of Contact

The Site will be readily contactable to outside organisations and to members of the public. The site signage board (placed in a readily visible location) will contain the necessary contact details for both the site operations and Agency. The company website also contains the necessary contact details for the site.

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Any complaints received directly to site will be notified to the Agency. Should an off-site issue arise, therefore, the complainant has a readily available means of getting in touch with the Operator.

6.5 Complaint Screening

As part of each dust complaint received, they will be objectively assessed against the wider environment to ensure that the source of the emission is traced back to the correct source. It is essential that the source is correctly identified in order that mitigating measures can be applied effectively and correctly. The complaint will also be assessed against previous records to place the nature of the complaint into context.

If patterns in complaints emerge, community groups or individuals (subject to their agreement) will be called upon to act as an additional dust monitoring resource.

6.6 Complaint Investigation

In the event that dust is found to be causing a problem from the Site, as determined and confirmed by investigation into off-site complaints, or during routine monitoring, measures will be taken to determine the source of this dust and the following courses of action as detailed below shall be taken to ascertain if the dust is coming from the Site;

- Additional dust monitoring as detailed above to identify the extent of the dust emission and potential cause for the dust i.e. waste material and/or activity;
- Examination of the operational activities at the time of the dust complaint;

- Examination of the meteorological conditions at the time of the complaint;
- Carry out a review of the operational procedure and controls and instigate any control measures immediately following identification of the problem; and,
- Further monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

It is recognised that whilst complainants are encouraged to report valid complaints to the regulatory bodies, complaints that are received/submitted directly to the site are able to be investigated more rapidly. As a result, complaints reported directly can be substantiated, reviewed and actioned quicker. With the complainant still able to report the complaint to the regulatory bodies after, should it be necessary.

Nevertheless, all complaints will be investigated.

6.7 Contingency and Emergency Plans

In the event that dust is proven to be from the site and found to be causing a problem, as determined by the investigation of off-site complaints or during routine on-site monitoring, action will be taken to determine the source and the following courses of action. Control and mitigation measures for each stage of the waste management process are as described in Section 3 and summarised in Table 3.

6.8 Abnormal Events

This DEMP assumes that the Site will be running under expected operational conditions. There are however circumstances that could result in a dust emission from the site if not appropriately considered in advance, discussed below.

6.8.1 Strong Winds

Wind direction will be noted and downwind locations visually inspected at the start of the working day and immediately following the commencement of site operations. If the normal control measures for the prevention of dust emissions some of or all the following additional actions will be instigated.

- Vehicle speed limits will be reduced.
- Vehicle movements will be limited.
- Additional road sweeping and water damping will be instigated on all haul roads.
- The site will be closed for the receipt of waste.
- Exposed water surfaces will be sprayed with water.

6.8.2 Hot / Dry Conditions

The warmer the weather the greater the potential for wastes to become dry and dusty. Inspection frequency for dust will increase as detailed above in section 6.8.1 and the same additional measures actioned. During prolonged periods of hot weather inspection frequency will be increased and the surface area of stored waste will be kept to a minimum.

6.8.3 Implementation of the Contingency plan and / or Emergency Plan

If closure to receipt of waste is considered an appropriate action the site manager who will inform the Senior Technical Manager and the Agency and site staff will implement measures to divert wastes as required.

6.8.4 Operator's Experience with Contingency / Emergency Situations

The operator has a policy of continuous review of emergency and contingency procedures which helps improve procedures across the operator's operations.

6.8.5 Review and Update of Contingency and Emergency Plans

The Contingency Plan and Emergency Plan will be reviewed following any incident where they have had to be followed. They will be updated as necessary with any lessons learned.

6.9 Records and Reviews

Records relating to the management and monitoring of dust will be maintained as necessary and will include the following details:

- The results of inspections and visual monitoring carried out by installation personnel;
- Weather conditions including atmospheric pressure, wind speed and wind direction;
- Problems including date, time, duration, prevailing weather conditions and cause of the problem;
- Complaints received including name and address of the complainant; and
- Details of the corrective action taken, and any subsequent changes to operational procedures.

The DEMP will be reviewed on a periodic basis with the scheduled review of the Site's EMS or with every major decrease, or alteration to the dust generated at site (i.e. a change to dust source term, pathway or receptor).

6.10 Communication Tools

Stakeholders will typically include the Local Authority, the Agency, Parish Councils and members of the local community. Other stakeholders may include local businesses and/or householders should the Site be deemed to impact upon them.

In addition, and as covered within the complaints section, contact details will be made available so that any complaints can be directed to site and an investigation undertaken immediately.

Appendix A – Dust Complaint Form

Dust Complaint Report Form	Date:	Ref:
Name and address of complainant		
Time and date of complaint		
Date, time and duration of dust emission		
Weather conditions (e.g., dry, rain, fog, snow)		
Wind strength and direction (e.g., light, steady, strong, gusting)		
Has complainant any other comments about the dust emission		
Any other previous known complaints relating to installation (all aspects, not just dust)		
Any other relevant information		
Potential dust sources that could give rise to the complaint		
Operating conditions at the time dust emission occurred (for quarry and recovery activity)		
Action taken:		
Final Outcome		
Form Completed By:		
Signed		

Appendix B – Historic Dust Data

Monitoring Point ID	Direction of sticky pad	Month of Exposure / Percentage Light Reflectance	Percentage Effective Area Coverage per day
		19/09/2019 to 04/10/2019	
1	N	91	0.6
	NE	93	0.5
	E	97	0.2
	SE	99	0.1
	S	99	0.1
	SW	98	0.1
	W	95	0.3
	NW	95	0.3
2	N	96	0.1
	NE	96	0.1
	E	95	0.2
	SE	94	0.2
	S	87	0.4
	SW	77	0.7
	W	90	0.3
	NW	98	0.1
3	N	99	0
	NE	99	0
	E	98	0.1
	SE	94	0.2
	S	94	0.2
	SW	97	0.1
	W	99	0
	NW	99	0

Sample Point	Period of Exposure	Total Dust Mass (mg)	Deposition Rate (mg/m ² /day)
1	Sep 19 to Oct 19	50	84
2	Sep 19 to Oct 19	199	161
3	Sep 19 to Oct 19	67	54



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