Asphalt Recycling Facility - Coxhoe Quarry

Bespoke Environmental Permit Application

Appendix 9 – Dust and Emissions Management Plan

Document Control

Version	Date	Report Reference	Author
Version 1	May 2025	SPH-CM-0040-RP02-A9 DEMP	Swift Environmental Compliance Limited

Contents

1 INTRODUCTION

1.1 Report Scope

1.1.1 Swift Environmental Compliance Limited (Swift) have been instructed by Tarmac Trading Limited (Tarmac) to prepare an application for a bespoke environmental permit for an Asphalt Recycling Facility at Coxhoe Quarry, Coxhoe, County Durham DH6 4BB (the Site).

1.1.2 Environment Agency's Application Form B4, Section 3b requests that; *'if the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them'*.

1.1.3 The Environment Agency Technical Guidance Control and monitor emissions for your environmental permit[1] states; *'You must provide a dust management plan if you are applying for a bespoke permit for… keeping or treating (or both) aggregates, soils, ashes or similar materials… and you are… within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar.'*

1.1.4 The Site is treating waste aggregates within 500 metres of a residential home, as such, this Dust and Emissions Management Plan (DEMP) has been produced.

1.2 Report Content and Structure

1.2.1 This DEMP has been prepared using the Environment Agency's DEMP Template Version 10. A copy of this DEMP is a made readily available on Site for site operatives, contractors, the Technical Competent Manager and Regulators to refer to.

1.3 The Site

1.3.1 The Asphalt Recycling Facility is situated in the northwestern section of the wider Coxhoe Quarry complex and is centred at National Grid Reference NZ 33979 35521, as illustrated at Appendix 1, Site Plans. The Site is located approximately 9km southeast of Durham and approximately 500m south of the village of Kelloe in County Durham.

1.3.2 The area surrounding the Site comprises predominately of agricultural and open land with pockets of dwellings and industrial activities beyond. The nearest residential properties are located at approximately 350m northeast of the proposed permit boundary at its closest point.

1.3.3 The Site is not located in a designated Air Quality Management Area according to the Department for Environment Food and Rural Affairs website (available at AQMAs interactive map (defra.gov.uk)).

1.4 Source

1.4.1 The Asphalt Recycling Facility includes the transfer, storage, treatment and bulking up of asphalt.

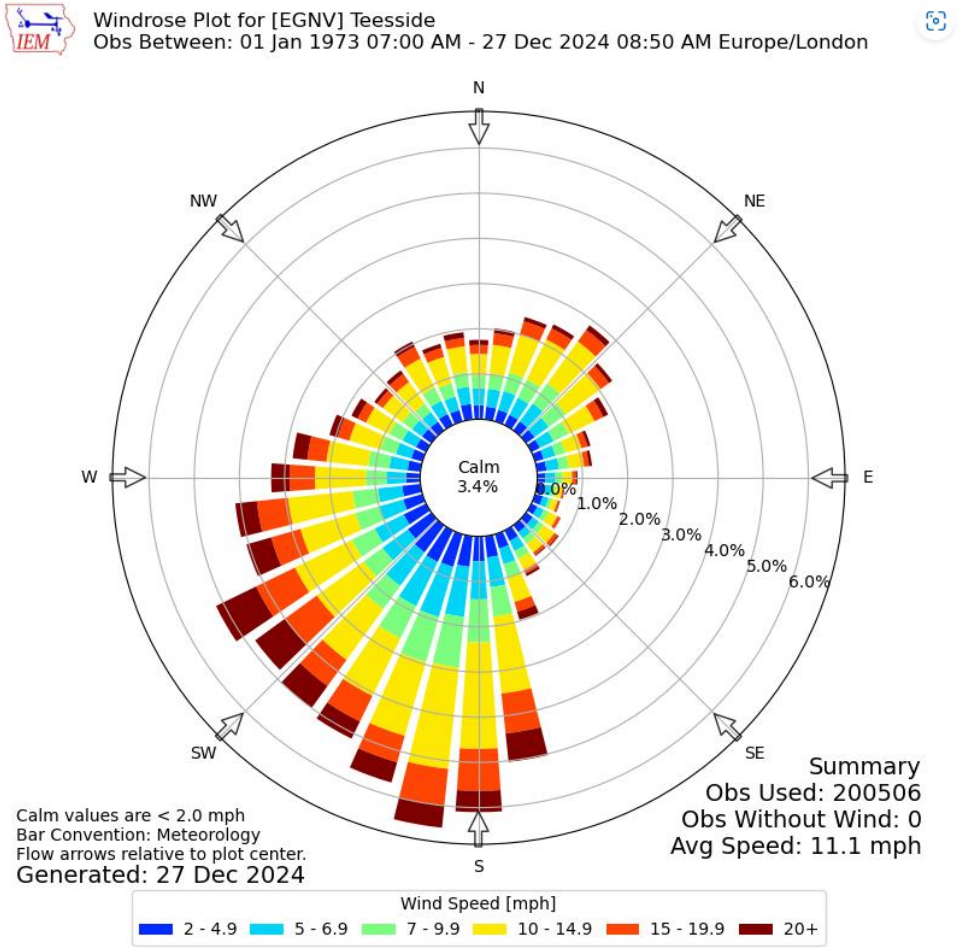
1.4.2 The treatment, handling and storage of asphalt are considered the most likely sources of dust and emissions from the waste management activities being undertaken at the Site.

[1] *Control and monitor emissions for your environmental permit - GOV.UK (www.gov.uk)*

1.5 Pathway

1.5.1 A Windrose dated December 2024 from the Site's nearest meteorological station at Teesside Airport[2] is presented at Diagram 1. The Windrose indicates that the predominant wind direction in the vicinity of the Site is towards the north and north-east.

Diagram 1 Teesside Windrose, Observations between July 1973 - December 2024[3]



1.6 Receptor

1.6.1 The Environment Agency DEMP Template states that, *'Sensitive receptors include, but are not limited to, environmental habitat site, hospitals, schools, protected species sites, childcare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to high levels of dust and particulates.'*

1.6.2 A full list of all potential receptors and defined 'sensitive receptors' within 1,000 metres of the Site have been identified in red within the Table 1 below. The locations of these receptors in relation to the Site and identification number are illustrated on the Sensitive Receptor Plan presented at Appendix 1.

1.6.3 Consideration for receptors that have the potential to be a source of dust and emissions within 1,000

[2] *Available at IEM :: Site Wind Roses (iastate.edu)*

metres radius from the Site boundary have been identified and are shaded grey in Table 1.

Table 1 Receptors

ID	Receptor	Description	Distance from site (rounded to the nearest 5m)	Direction from site
1	Raisby Hill Quarry	Industrial	0	E, SE, S
2	Raisby Hill Grassland - SSSI	Conservation site	60	W
3	Raisby Hill Quarry - SSSI	Conservation site	65	NE
4	Agricultural land	Agriculture	80	W, NW, N, NE, S
5	Hill Top View	Residential	149	NE
6	Coxhoe medieval settlement	Scheduled Monument	170	NW
7	Bradyll Street	Residential	240	NE
8	WWTW	Industrial	270	N
9	Coxhoe Beck	Water Body	300	N
10	Garmondsway	Scheduled Monument	400	S
11	Depot	Industrial	425	SW
12	Kelloe	Residential	495	N
13	Coxhoe East Farm	Residential and Industrial	535	NW
14	Kelloe Community Primary School	School	725	NNE
15	Garmondsway Village	Residential	755	SE
16	Playground	Recreational	800	NW
17	Low Raisby	Residential	870	NE

2 WASTE OPERATIONS

2.1 Waste Deliveries

2.1.1 Waste will be delivered to the Site through the main Coxhoe Quarry entrance and directed to the Site via signage. All heavy goods vehicles entering or exiting the Site carrying waste or treated aggregates will be instructed to sheet or otherwise contain their loads (for example a fully enclosed vehicle) to minimise the potential for the release of dust when transporting materials.

2.1.2 Waste Transfer Notes will be completed along with the waste acceptance and rejection procedures outlined in the Environmental Management System and in accordance with Waste Duty of Care requirements.

2.2 Overview of Waste Processing, Dust, and Other Emission Controls

2.2.1 Transfer and treatment will take place outside of a building and within the existing footprint of the Asphalt Recycling Facility.

2.2.2 The waste types to be accepted at the Site are as authorised by the Permit and in accordance with the waste acceptance and rejection procedures which are implemented at the Site. The acceptable waste types in the Permit are tabulated at Appendix 12 of this bespoke permit application and permitted wastes will be those listed in the permit once issued. Wastes comprising solely or mainly dusts, powders or loose fibres are prohibited at the Site.

2.2.3 The Site layout has been designed to distinguish between the different waste types, treatment processes and to limit double handling as much as possible to increase efficiency at the Site and minimise the disturbance of wastes and treated aggregates.

2.2.4 The Site layout considerations including vehicle access routes, treatment location and storage areas are designed to reduce the possibility of dust and emissions leaving the Site boundary.

2.3 Mobile Plant and Equipment

2.3.1 Nitrogen Dioxide gas is a by-product of internal combustion engines and the site uses several items of plant with internal combustion engines. The following table lists the type, mobile and emission ratings for the mobile plant and equipment used on site:

Table 2 Mobile Plant and Equipment

Description	Make	Model
Loading shovel	Volvo	L150 H
Telehandler	Caterpillar	TH360

2.3.2 All mobile plant and equipment on Site are maintained and operated in accordance with manufacturers recommendations and as outlined in the Environmental Management System.

3 DUST AND PARTICULATE MANAGEMENT

3.1 Responsibility

3.1.1 The Technically Competent Manager (TCM) is responsible for the management of particulate matter and site staff will be trained appropriately. When the TCM is not present at the Site a suitably trained deputy will be appointed and is responsible for the management of dust and particulate matter.

3.1.2 This DEMP will be periodically reviewed and updated which will form part of the overall Environmental Management System review and training process. Amendments to the DEMP will be communicated to site staff and appropriate training will be provided.

3.2 Sources and Control of Fugitive Dust/Particulate Emissions

Sources

3.2.1 The operations at Site that have the potential to produce dust and particulates include:

- Vehicles entering and/or leaving the site with mud on wheels and tracking dust on to or off the Site.
- Debris falling off lorries which arrive uncovered.
- Vehicles and plant moving around the Site kicking up dust
- Road vehicles tipping waste
- Excavators/360s sorting waste
- Asphalt Recycling Facility activity
- Waste stored in bays
- Site surfaces (not just the ground including around plant and equipment)
- Loading waste and recycled materials back on to vehicles.
- Particulate emissions from the exhaust of vehicles/plant/machinery on Site.
- Generators, plant and other non-road going mobile machinery.

3.2.2 Measures that will be used on Site to control emissions of dust and particulate matter are presented at Appendix 2.

3.3 Water usage and availability

3.3.1 Control measures include, dampening down of site surfacing and stockpiles during dry weather using an installed dust suppression system. Water availability will be from clean water harvested from the roof of the building and additional water can be obtained from mains water if required. In the unlikely event of insufficient water being available to provide effective dampening down, waste treatment activities will temporarily stop until sufficient water is available.

3.3.2 Dust suppression with installed sprays on the site perimeter will provide sufficient coverage of the

stockpiles. The underground storage tank has been installed with sufficient capacity to contain the dust suppressant water.

3.4 Visual Dust Monitoring

3.4.1 The Site is not located in an Air Quality Management Area and there are no Sensitive Receptors located within 300m of the prevailing wind direction. As such, it is considered that offsite visual dust monitoring is appropriate for this Site.

3.4.2 Site staff will be trained to visually check for dust becoming airborne whilst the asphalt recycling facility and vehicle movements are operational.

3.4.3 The results of the daily visual monitoring will be recorded in the site diary.

3.4.4 If dust from the permitted site is detected beyond the site boundary the following actions are to be completed:

- Contact the TCM and/or Site Manager;
- TCM / Site Manager to investigate root cause of the dust emission;
- Undertake prompt remedial action to prevent further emissions (Temporarily cease treatment operations if required whilst remedial action are underway);
- Complete an additional dust monitoring check; and
- Record the event and actions taken in the site diary.

3.4.5 The TCM and / or Site Manager will use weather forecasts to be prepared for weather conditions such as prolonged dry spells and high winds and in these occasions increased the control measures and dampening down on Site to prevent the aerial emissions of dust outside of the permit boundary.

4 REPORTING AND COMPLAINTS RESPONSE

4.1.1 A site identification board with relevant contact details will be situated at the Site entrance, this will enable anybody wishing to notify Tarmac of a complaint the opportunity to do so. Tarmac understand the importance of being a good neighbour to local businesses and residents.

4.1.2 If a complaint is received with regards to dust, this will be dealt with in accordance with the complaints procedure in the Environmental Management System. The complaint will be recorded, investigated and actions taken where appropriate. Records of all complaints will be kept as stated in the Environmental Management System.

5 SUMMARY

5.1.1 This site specific DEMP has been produced in accordance with the Environment Agency's DEMP Template in relation to the waste transfer station and treatment activities. This DEMP has assessed the risk of dust emitting from the site activities using a source, pathway and receptor model.

Conclusion

5.1.2 The Site undertakes appropriate mitigation measures to reduce the production of dust and emissions, including but not limited to adhering to strict housekeeping operations and waste management measures to reduce the possibility of dust being emitted from beyond the permit boundary.

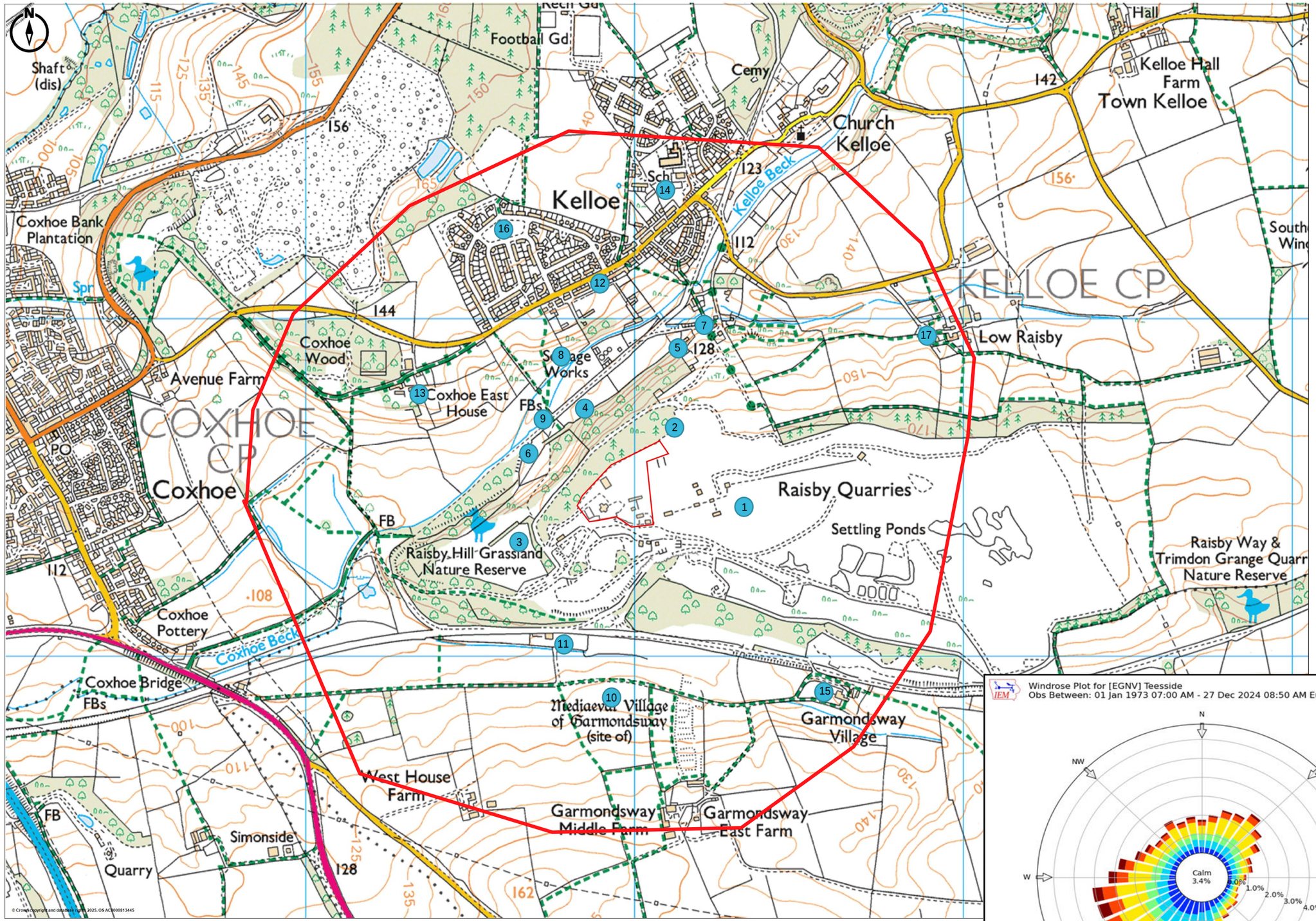
5.1.3 The Site setting and mitigation measures indicate that the Site has a 'low' potential to generate dust emissions.

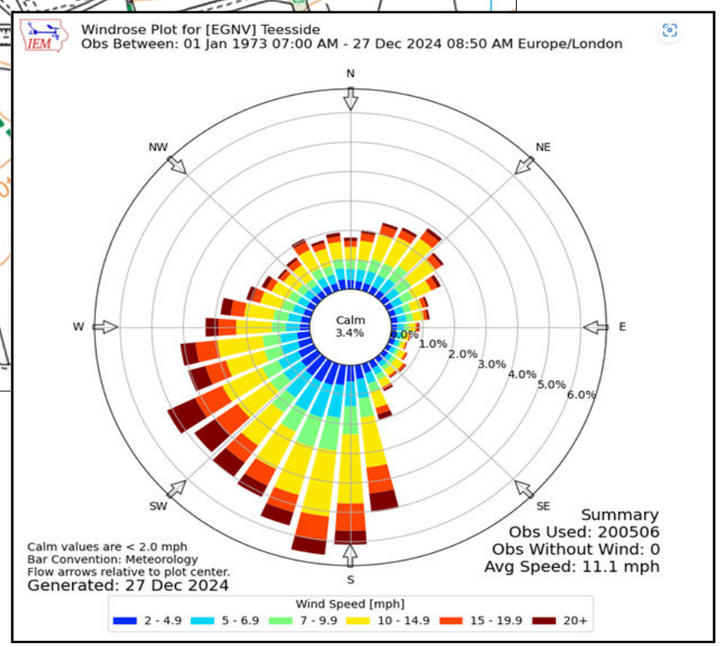
APPENDIX 1 – SENSITIVE RECEPTOR PLAN

Asphalt Recycling Facility, Coxhoe Quarry - Site Receptor Plan

Tarmac Trading Limited
May 2025
Drawing Ref. TAR-CH-0064-DW03

SWIFT





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LANDMARK INFORMATION

Plotted Scale - **1:12500**. Paper Size - **A3**

APPENDIX 2 - DUST MANAGEMENT

APPENDIX 2 TABLE 1 - SOURCE-PATHWAY-RECEPTOR ROUTES

APPENDIX 2 TABLE 2 MEASURES THAT WILL BE USED ON SITE TO CONTROL DUST, PARTICULATES AND OTHER EMISSIONS

DEMP Appendix 2 – Table 1 - Source-Pathway-Receptor Routes

Source	Pathway	Receptor	Type of impact	Where relationship can be interrupted
Mud	tracking dust on wheels and vehicles, then mud dropping off wheels/vehicles when dry	Local Highways	Visual soiling, also consequent resuspension as airborne particulates	Remove mud before vehicles leave site. Long road between site boundary and highway ensures residual mud drops off before vehicle reaches public highway. Tarmac to employ a road sweeper which is available to be deployed when required.
Debris	falling off lorries	Local Highways	Visual soiling, also consequent resuspension as airborne particulates	Long road between site boundary and highway ensures residual mud drops off before vehicle reaches public highway. Tarmac to employ a road sweeper which is available to be deployed when required.
Tipping, storage and sorting of wastes in the open	Atmospheric dispersion	Receptors identified in DEMP	Visual soiling and airborne particulates	Minimise source strength by means of low drop heights, profiling and shielding of piles from wind whipping, positioning sources away from receptors. Also wetting of aggregates.
Vehicle exhaust emissions	Atmospheric dispersion	Receptors identified in DEMP	Airborne particulates	Regulatory controls and best-practice measures to minimise source strength.
Non road going machinery exhaust emissions	Atmospheric dispersion	Receptors identified in DEMP	Airborne particulates	Regulatory controls and best-practice measures to minimise source strength.

DEMP Appendix 2 – Table 2 – Measures that will be used on site to control dust, particulates and other emissions

Template of Table 2 taken from Environment Agency DEMP template Version 2. Text in red is unchanged from the template and site mitigation measures detailed with justification based on risks identified in Table 1, source-pathway-receptor routes.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
Preventative Measures			
Enclosure within a building	Creating a solid barrier between the source of dust and particulates and receptors is likely to be the most effective method of control, provided that the building entrances and exits are well managed.	Very effective despite costs and the high potential for disruption to already operational sites. New sites are strongly recommended to fully enclose from the outset. This is a required 'standard design feature' by Office of the Deputy Prime Minister (ODPM) guidance. **If your site is in a London Borough you are likely to be required to fully enclose your activities in a building.** If your site is in a sensitive location then you are likely to be required to fully enclose your activities in a building. Ensure that procedures are in place to manage the building and its integrity.	The Site is located within an existing quarry footprint and is not located in an AQMA. The Site has been operational as an Asphalt Recycling Facility for several years. It is not considered necessary to install a building or enclosed the activities in this location.
Site / process layout in relation to receptors	Locating particulate emitting activities at a greater distance and downwind from receptors may reduce receptor exposure, provided that emissions from the source are not dispersed over significant distances.	May be worthwhile in combination with other measures to reduce dust and particulate generation. If at all possible discuss at pre-application and prior to site design if the activity is known to be cause lots of dust and particulates. For existing sites this will require the operator to think about moving the site	The treatment of aggregate has been strategically positioned at the location least likely to have an impact on nearby receptors and the furthest point from the nearest residential property.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
		around or proposing temporary areas in inclement weather.	
Site speed limit, 'no idling' policy and minimisation of vehicle movements on site	Reducing vehicle movements and idling should reduce emissions from vehicles. Procurement policy to only purchase clean burn road vehicles and non-road going mobile machinery. Enforcement of a speed limit may reduce re-suspension of particulates by vehicle wheels.	Easy to implement as part of good practice. Should be identified clearly in the site management system and implemented as appropriate measures.	Vehicle movements through Coxhoe Quarry and on Site are restricted to 10mph, a no idling policy is implemented on Site and the layout of the site has been designed to limit vehicle and waste movements.
Minimising drop heights for waste. Use of enclosed chutes for waste drops/end of conveyor transfers and covered skips / storage vessels.	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. Enclosing processes will further reduce dispersion.	Relatively easy to implement at many sites. These steps should be identified clearly in the site management system and implemented as appropriate measures.	Drop heights from vehicles offloading will be reduced to shorten the distance over which treated aggregates are dropped on to the site surface, thereby reducing the opportunity for dusts and particles to be emitted from the process.
Good house-keeping	Having a consistent, regular housekeeping regime that is supported by management, will ensure site is regularly checked and issues remedied to prevent and remove dust and particulate build up.	Easy to implement and requires minimal equipment. Encourages a sense of pride and satisfaction amongst the staff which promotes vigilance and a positive culture. Staff should target the areas not caught by the road sweeper and other cleaning apparatus. Details on the frequency, job roles and areas covered should be documented here.	Good housekeeping forms part of the Environmental Management System and site checklist. The TCM will be checking that the Environmental Management System is being adhered to and will actively be checking that any issues are rectified promptly and the accumulation of dust and particulates is prevented.
Sheeting of vehicles	Prevents the escape of debris, dust and particulates from vehicles as they travel.	Relatively easy to implement at many sites. Should be identified clearly in the site management system and implemented as appropriate measures.	All heavy goods vehicles entering or exiting the site carrying waste or treated aggregates will be instructed to sheet or otherwise contain their loads (for example a fully enclosed vehicle) to minimise the potential for the release of dust when transporting materials.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
Hosing of vehicles on exit	May remove some dirt, dust and particulates from the lower parts of vehicles although likely to be less effective than a more powerful wheel wash.	May be worthwhile where wheel wash installation is not feasible, or where the wheel wash does not achieve the desired outcome. This should be in the site procedures and training. If the action works as a control measure, then consideration must be given to installing a wheel wash as the appropriate measure.	The implementation of good housekeeping of the site surface will reduce the opportunity for vehicles to accumulate mud and debris from the Site. Where vehicles are observed to have a build up of dirt, dust or particulates manual spraying using a hosepipe of the vehicle will be undertaken prior to leaving the Site.
Ceasing operation during high winds and/or prevailing wind direction	Mobilisation of dust and particulates is likely to be greater during periods of strong winds and hence ceasing operation at these times may reduce peak pollution events.	Likely to reduce dust and particulate emissions, however, not a long-term solution. Procedures should be in place to identify when operations will cease. May require a weather station to be installed.	The TCM / Site Manager will use weather forecasts to be prepared for weather conditions such as prolonged dry spells and high winds and in these occasions increased the control measures and dampening down on site to prevent the aerial emissions of dust outside of the permit boundary.
Installed wheel wash	Provides a high pressure wash of vehicle wheels and lower parts (including under body) using a series of jet sprays. More effective if vehicles drive through the wheel wash slowly in order that there is sufficient time for dirt to be removed.	Proven results where wheel wash is well designed and vehicles drive through slowly on entry and exit. Should be identified clearly in the site management system and implemented as appropriate measures. The range of wheel wash technology is rather large and to avoid any knowledge gaps, this section should detail specifics about the wheel wash. Consider using photos to assist. You should consider the placement and positioning of the wheel wash in this document too along with contingency plans for downtime or breakdown.	A dust suppression system has been designed and installed at the site. In addition, Manual spraying using a hosepipe of the vehicle will be undertaken prior to leaving the site if vehicles are observed with a build up of dirt, dust or particulates.
Easy to clean concrete impermeable surfaces	Creating an easy to clean impermeable surface, using materials such as concrete as opposed to unmade (rocky or muddy) ground within the site and	Considered good overall based on dust and particulate reduction but potentially costly and disruptive to retrofit. For sites that have concrete surfaces ensure there are	Tarmac have operated the Site as an Asphalt Recycling Facility for several years and received no complaints with regards to deposits on local highways or from nearby residents. As such, the measures currently

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
	on site haul roads. This should reduce the amount of dust and particulate generated at ground level by vehicles and site activities.	maintenance and cleaning procedures in the management system and they are implemented.	implemented to manage the Site are considered appropriate to continue with a hardstanding surface.
Minimisation of waste storage heights and volumes on site	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.	Likely minimal return on potentially costly layout changes. The amount of waste that can be managed on site without causing dust and particulate pollution should be identified in the management system and may have to be reduced if it is considered an appropriate measure.	Waste storage will be within permitted limits and in accordance with the Environmental Management System and existing site layout. Drop heights from vehicles offloading will be reduced to shorten the distance over which treated aggregates are dropped on to the site surface, thereby reducing the opportunity for dusts and particles to be emitted from the process.
Reduction in operations (waste throughput, vehicle size, operational hours)	Reducing the amount of activity on site, including no tipping, shredding, chipping or screening of high risk loads during windy weather as well as associated traffic movements should result in reduced emissions and re-suspension of dust and particulates from a site.	Effective in terms of dust and particulate reduction but unlikely to be popular/implemented by operators. It may be the only option when other steps fail. Ensure the site has procedures to reduce activity on site if required through complaints or known issues, or adverse weather conditions. This may include installing a weather station to alert the site to windy weather and when they need to reduce agreed activities.	The TCM / Site Manager will use weather forecasts to be prepared for weather conditions such as prolonged dry spells and high winds and in these occasions increased the control measures and dampening down on site to prevent the aerial emissions of dust outside of the permit boundary.
Remedial Measures			
Netting / micro netting around equipment	Erecting netting around equipment that could give rise to large amounts of dust and particulates may be effective within the site boundary and prevent their dispersion off-site / their re-suspension within the site.	Reduces wind speed across the site which indirectly controls the potential for dust and particulate emissions. Maintenance should be covered in the management system and procedures. Effective for use as litter netting, but not for stopping dust from leaving the site boundary.	Given the site setting within a quarry and with the good housekeeping and dust mitigation techniques proposed it is not considered that netting will be required for equipment.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
On-site sweeping	Sweeping could be effective in managing larger debris, dust and particulates but may also cause the mobilisation of smaller particles. Road sweeping vehicles damp down dust and particulates whilst brushing and collecting dust and particulates from the road surface, particularly at the kerbside. This may generate dust and particulate movement that may become a Health and Safety issue if the filters and spray bars on the sweepers are not maintained.	Easy to apply but less effective than other measures. Should be covered in the management system and procedures and implemented thoroughly. Be specific and consider including photos of the apparatus. The range of roadsweeping equipment is very broad and you should detail what is being used. We would expect to see training procedures to ensure that staff are clear on what needs to happen and when. We would expect to see maintenance scehdules detailing when consumable items on road sweepers are replaced (Filters, brushes etc).	Tarmac have fully serviced and maintained road sweepers as part of their wider business activities. Tarmac are trained in the use of road sweepers and they are available to be used to dampen down the site surface, whilst also brushing down and collecting dust and particulates. The road sweepers will be deployed as covered in the Environmental Management System and as part of good housekeeping techniques.
Site perimeter netting / micro netting	Erecting netting around the site perimeter may capture released debris and dust and particulates prior to it being dispersed off-site.	Reduces wind speed across the site which indirectly controls the potential for dust and particulate emissions. Maintenance should be covered in the management system and procedures. Can look untidy and dirty creating negative impression of the facility. Not very effective at reducing dust and emissions from leaving the site boundary.	Given the site setting within a quarry and with the good housekeeping and dust mitigation techniques proposed it is not considered that netting will be required for equipment.
Water suppression with hoses & water jets	Damping down of site areas using hoses can reduce dust and particulate re-suspension and may assist in the	Quite water intensive. Can reduce the calorific value of the material which should be considered if sent for energy recovery/biomass type operations.	Control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
	cleaning of the site if combined with sweeping.	Maintenance should be covered in the management system and procedures.	
Water suppression with mist sprays	Installation of mist sprays around sites, at building entrances/exits and within buildings at point source emissions like conveyors, trommels etc. It can also assist in the damping down of dust and particulates, therefore, reducing emissions from site.	Very effective at controlling point source emissions of dust and particulates. Can be installed to conveyors and areas where waste is dropped. 'Halo' rings can be fitted to conveyor drops on concrete crushers and screeners to minimise dispersion. Not effective for use at site boundaries. Uses less water than water bowser Maintenance should be covered in the management system and procedures.	As above. Control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.
Water suppression with bowser	Using bowsers is a quick method of damping down large areas of the site with large water jets. This method could also be used on easy-to-clean, impermeable concrete surfaces.	Highly water intensive and more likely to minimise dust and particulates on the ground that is at risk of being re-suspended rather than already airborne dust and particulates. Very effective at dampening down haul roads and large surface areas. Can also come with hose attachments and other attachments to increase its versatility. Can reduce the calorific value of the material which should be considered if sent for energy recovery/biomass type operations. Maintenance should be covered in the management system and procedures.	As above. Control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.
Dust and particulate monitor with trigger alarm	Installation of a dust and particulate monitor with specified alarm trigger level can alert site staff when short-term particulate concentrations are elevated in order that site practices can	Worthwhile installing as a real-time tracker of dust and particulate concentrations. Helpful to monitor environmental performance and also to track the	Site staff will be trained to visually check for dust becoming airborne whilst the treatment of asphalt and vehicle movements are operational. In addition, to these visual checks, daily visual monitoring of dust will be undertaken at one location upwind of the site activities and two

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
	be reviewed or application of mitigation measures increased.	effectiveness of improvements made at the site. It is important that the equipment is backed up by a suitable maintenance contract and initial capital costs, with maintenance is sub £10k for a suitable system. At multi-operator sites this kind of system can be used to demonstrate a specific site is not a source of dust and particulate pollution. ***Note** - The alarm trigger isn't set in permit conditions as a "compliance limit" but by the operator in the Dust Management Plan as an "action level" to alert the operator that they may be generating dust. The operator should stop once the alarm sounds and if they believe they are the source then they should modify their operations and report to the EA. If the dust isn't coming from their operations then they should note it down and continue with their operations. Experience has shown us that a limit of less than 75 ug/m3 (over a 5 min average) for PM10 should be considered by operators initially and reviewed down after the system has been in place for some time. NOTE - Regulatory emphasis should NOT be placed on the exceedance but instead on the action the*	locations downwind of the site activities and whilst the site is operational.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
		operator takes, if they are the source, to prevent a re-occurrence.	
Shaker grids	Similar to cattle grids, these are installed at a site entrance and exit. The movement of vehicles over the grids shakes dust and particulates from the wheels, thus removing them before vehicles enter the site.	Unlikely to be as effective and as thorough wheel washing. Work better for sites without impermeable surfaces where large amounts of mud need to be shaken off tyres and undercarriages. Must then be used in accordance with a wheel wash before exiting site onto the public highway. Maintenance should be covered in the management system and procedures.	The site benefits from a hardstanding permeable surface and therefore thorough wheel washing will be sufficient.
Water Cannons	Water cannons provide a means for delivery of powerful water streams from a water truck. With variable nozzles, the spray pattern can be controlled and varied between jet and fog. Typical water flows are up to 5000 litres per minute. Water cannons are most often used for fire protection, mining operations, heavy machinery wash down, cleaning and dust and particulate abatement.	Highly water intensive and more likely to minimise dust and particulates on the ground that is at risk of being re-suspended rather than already airborne dust and particulates. Covers a large area in a short amount of time. Can reduce the calorific value of the material which should be considered if sent for energy recovery/biomass type operations. Should be identified clearly in the site management system and implemented as appropriate measures. Produces large amounts of run-off that need to be managed to prevent pollution.	Water cannons are not considered appropriate for the scale of operations proposed at the site. As above, control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.
Screening of buildings / reducing large	Installing plastic strips to cover entrances/exits to buildings may reduce emissions of dust and	This is a well-established approach and works well in association with other measures e.g. hosing of waste and	N/A

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
apertures using plastic strips	particulates dispersing through doorways.	downward facing misters at building entrance. Reduces the encroachment of wind into the building and traps emissions on the inside. Vehicles can damage them and they do wear out over time. Sites could consider holding small supplies of spares. Maintenance should be covered in the management system and procedures.	
Application of CMA / chemical suppressant	Diluted Calcium Magnesium Acetate (CMA) or other chemical based dust suppressant is regularly applied by spraying using a back-pack applicator for small areas or by road sweeper to cover larger areas. CMA acts as a suppressant with the aim of reducing dust and particulate re-suspension and hence ambient concentrations.	Trials indicate this can be an effective process. It shouldn't be applied during rain and once applied it needs to be re-applied regularly. Works best when applied to clean surfaces, and can also be applied to stockpiles to form a 'crust' and reduce wind-whipping. Price and efficacy vary depending on the brand selected. Maintenance should be covered in the management system and procedures.	There are no proposals to apply a chemical suppressant to the water used to dampen down the site. As above, control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.
Heavy Water	Heavy water is used to improve the compaction and stability and reduce dust and particulates on unsealed roads or areas of land. Ideally it is blended into the road construction material as the road is constructed, but where this is not possible it can be sprayed onto the top of the road. Heavy water combines fast acting wetting agents with polymer binders, to allow penetration deep into the	Potentially useful but only for sites with large areas of unmade ground. Should be identified clearly in the site management system and implemented as appropriate measures.	The Site is located within a larger quarry complex with large areas of unmade ground, as such heavy water is not considered a beneficial mitigation method.

Abatement Measure	Description / Effect	Overall consideration and implementation	Mitigation Measures
	material and to 'agglomerate' the dust and particles together.		
Foam Suppression	The aggregate and mining industries frequently use foam suppression for the control of dust and particulate emissions, mixing the foam with broken material to increase efficiency. Foaming agents can be added to increase the efficiency of dust and particulate reduction. Foam suppression has seen increased attention in recent years and has previously been applied to waste transfer facilities where crushing of waste occurs. If using foam suppression to control dust and particulates from waste drops, the foam must be entrained within the waste material and as such must be injected prior to dropping the waste rather than at the bottom of the drop.	Potential to be useful at waste transfer sites. There is some evidence that this method is highly effective for controlling dusts and particulates on conveyor drops. Should be identified clearly in the site management system and implemented as appropriate measures.	There are no proposals to apply any foam suppressant to dampen down the Site. As above, control measures include, dampening down of site surfacing and stockpiles during dry weather using fixed installed dust suppression system, or manual spraying.

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