

SMITHS (GLOUCSTER) LTD FROMEBRIDGE

DUST & EMISSION MANAGEMENT PLAN (DEMP)

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DEMP Drawing AQ1: Site setting and receptor locations

1 Introduction

This Dust and Emissions Management Plan (DEMP) relates to the recontouring of land to the east of the A38 at Fromebridge, Whitminster, Gloucestershire, GL2 7PG using imported materials (i.e. 'the site').

The proposals at the site have been brought forward by Mr & Mrs A Smith and were granted planning approval by Stroud District Council on 21st July 2021 (planning ref: S.20/2109/FUL):

'Agricultural improvement of old mineral excavation area with recontouring of land using imported subsoils and soils.'

The principal contractor undertaking the works and holding the environmental permit will be Smiths (Gloucester) Limited.

1.1 Site Location

The site is located at approximate OS GR 376980, 206720, as shown on the drawing **DEMP1** 'Site Setting and Receptor Locations'. The total area within the red line application boundary is 5.9Ha.

The site lies within the administrative authority of Stroud District Council, which has declared no Air Quality Management Areas (AQMAs) for particulate matter, or any other pollutant.

1.2 Scope of DEMP

The scope of this DEMP is limited to matters relating to dust, including the larger fractions often referred to a nuisance ('disamenity') dust and those which are smaller, typically <15µm in diameter, and settle less readily. These smaller particles are known as Total Suspended Particulate ('TSP') and may include PM10s and PM2.5s, for example.

1.3 DEMP Status

This DEMP is complementary to details on plant and operations etc, which are not duplicated in the DEMP. The DEMP is intended to be a live document which serves as a reference during daily operations, and as such will be reviewed at least annually and updated where necessary or on a more frequent basis should the following occur:

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

[*Examples of significant changes are described in each section of this DEMP, as relevant to those plant or operational practices]

1.4 DEMP Structure

The DEMP has been structured in accordance with the requirements of the Environment Agency and is consistent with their DEMP template in that it describes:

- Site Setting and Meteorology;
- Operations at the Fromebridge site;
- A Dust Risk Assessment;
- Dust and Particulate (PM₁₀) Management measures;
- Monitoring in place at the site;
- Reporting and Complaints Response; and
- Measures for Continuous Improvement.

This DEMP document also references a number of appendices which also form part of the wider site management measures.

1.5 DEMP Availability

This DEMP is electronically stored by the operator. An uncontrolled printed version is available from the site notice board.

1.6 Staff training and Competency

The content of this DEMP is trained out to the site manager and assistant manager. Training is recorded by the operator.

1.7 Responsibility for Implementation of the DEMP

The DEMP is implemented by the site manager, full details of responsibilities, staff training etc are set out in Section 6.3.

Note: This document contains date and time information which will update whenever the MS word version of the document is updated. This ensures that where the DEMP is printed it will be clear whether the associated appendices are the most recent at that point and seeks to prevent multiple versions of the same DEMP being in circulation with outdated information / appendices where

2 Site Setting and Meteorology

2.1 Sensitive Receptors and Relative Distances

The site comprises low grade agricultural land to the East of the A38. It is located adjacent to the petrol station to the north of the Fromebridge junction with the B4071 (Perry Way) that heads towards Frampton on Severn. The site was a former mineral extraction site that was quarried but not properly restored and is now used as grazing land due to the uneven nature of the site making it unable to allow traditional crop cultivation.

To the north / west of the A38 is an industrial park containing, amongst others:

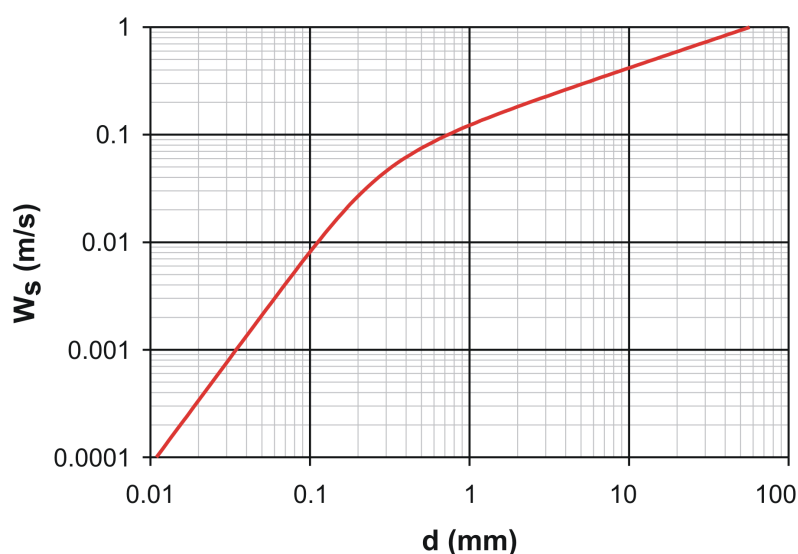
- Moreton C Cullimore / Cullimore Group: aggregates supplier; and
- Problast Concrete pumping: Ready-Mix Concrete Supplier.

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

- The Fromebridge Service Station;
- Fromebridge Cottages / Horseshoe Cottage; and
- Netherhills Cottage.

A plan of the site showing the distance to receptors is included as **DEMP1** 'Site Setting and Receptor Locations'. The total area within the red line application boundary is 5.9Ha.

Terminal Settling Velocity for a non-bouyant particle is defined in Stokes' Law, which combines the gravitational force acting downward on a free falling sphere (i.e. particle of less than 250 μm) with the drag forces acting in resistance to the fall. The larger the particle size, the higher the settling velocity and this will result in the largest particles dropping back to the ground very quickly, with the smallest particles. This is shown in the graph overleaf.



The human eye can detect particles as small as 50µm in diameter, meaning that any 'visible dust' will fall to earth very quickly, well within 100m of the source, unless the particle is dry and the wind speed is very high (e.g. a 'high wind' above 15m/s). In order for the particle to be resuspended the friction on that particle must be overcome once more. The distance relevant for processes that have the potential to release particulates has been well researched over many decades and these have formed the basis of relevant 'buffer' and 'setback' distances around the world.

In the UK, the IAQM has considered evidence from mineral operations and also other dust sources such as construction sites and inert waste landfill sites, in order to categorise the relative risk as related to receptor distance. Table 3 from the IAQM Construction Guidance is shown below¹ for a source with the potential to emit dusts:

- Proximity Band 1: <20m;
- Proximity Band 2: 20m - 50m;
- Proximity Band 3: 50m - 100m;
- Proximity Band 4: 100m - 200m; and
- Proximity Band 5: 200m - 350m.

Although there is a theoretical possibility that the smallest dust particles could be carried greater than 350m on the driest, windiest days, the risk of resulting in a nuisance dust event is considered to be negligible from all but the largest sources.

Relative receptor sensitivity (which the IAQM states is consistent for both dust and odour) is shown below and will determine the risk of dust complaint². The Fromebridge Site lies in a rural area with existing dust generating activities to the north west. Notwithstanding this, the 3 receptor locations (4 properties) would be regarded as 'high sensitivity'³:

High sensitivity receptor – surrounding land where:

- *users can reasonably expect enjoyment of a high level of amenity; or*
- *the appearance, aesthetics or value of their property would be diminished by soiling; and*
- *the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.*

indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.

¹ Institute of Air Quality Management, May 2016 (v1.1) *Guidance on the Assessment of Mineral Dust Impacts for Planning*. www.iaqm.co.uk

² Institute of Air Quality Management, October 2018 (version 1.1) *Guidance on Monitoring in the Vicinity of Demolition and Construction Sites*. www.iaqm.co.uk

³ IAQM construction dust p16.

In relation to the smallest particulates (PM_{2.5} and below) the most significant sources in 2022 according to DEFRA for OS Grid Ref 377000, 206500 are as shown in Table 2.1, below:

Table 2.1 PM_{2.5} sources (DEFRA)

Month	Concentration (µg/m ³)	% of total
Total PM _{2.5}	8.433	100.0%
Motorway in	0.017	0.2%
Motorway out	0.009	0.1%
Trunk A Rd in	0.000	0.0%
Trunk A Rd out	0.000	0.0%
Primary A Rd in	0.004	0.0%
Primary A Rd out	0.003	0.0%
Minor Rd+Cold Start in	0.000	0.0%
Minor Rd+Cold Start out	0.002	0.0%
Brake tyre in	0.037	0.4%
Brake tyre out	0.030	0.4%
Road Abrasion in	0.036	0.4%
Road Abrasion out	0.024	0.3%
Industry in	0.003	0.0%
Industry out	0.222	2.6%
Domestic in	0.006	0.1%
Domestic out	0.229	2.7%
Rail in	0.000	0.0%
Rail out	0.014	0.2%
Other in	0.002	0.0%
Other out	0.052	0.6%
PM secondary	4.929	58.4%
Residual+Salt	2.774	32.9%
Point Sources	0.039	0.5%

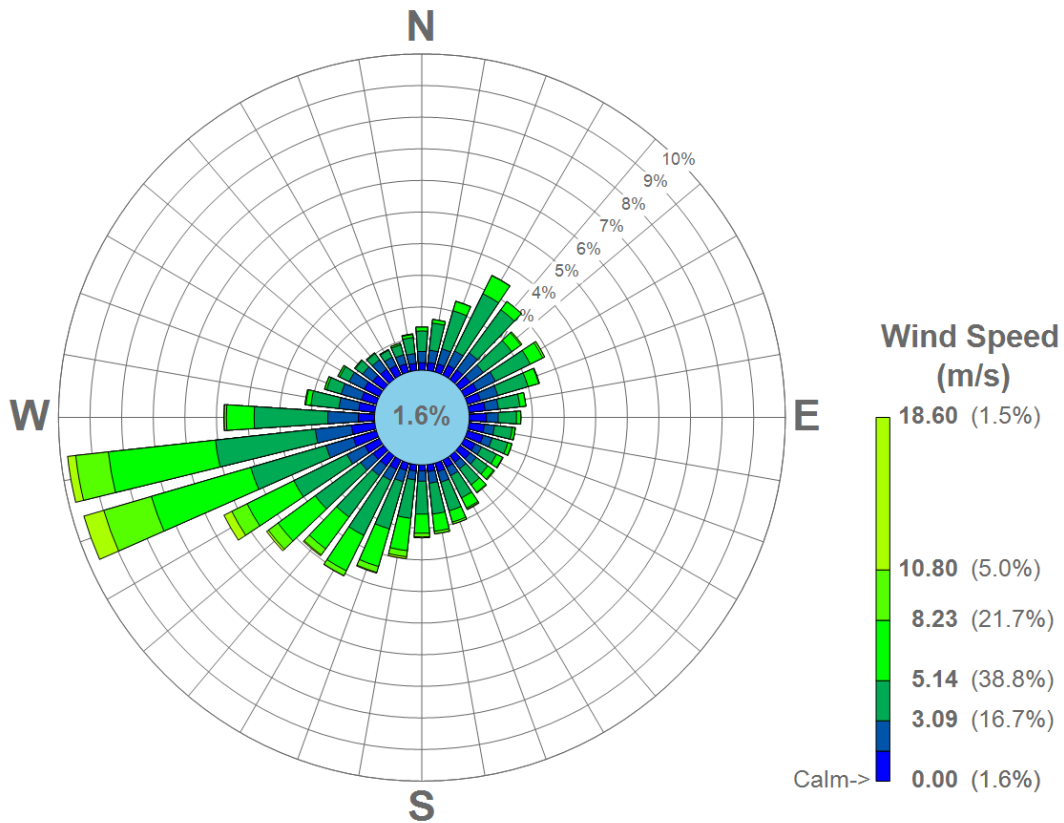
All industry accounts for less than 3% of the PM_{2.5} in the area, which is dominated by:

- *secondary PM₁₀*: Secondary PM (inorganic and organic); and
- *residual + salt*: Sea salt, calcium and iron rich dusts and regional primary PM and residual non-characterised sources.

2.2 Meteorology

A 5-year windrose for the closest meteorological data station (Filton) is shown in Figure 2.2. As with Filton, the wind speed and direction is expected to be heavily influenced by winds from the Bristol Channel / Severn Estuary.

Figure 2.2: Wind rose showing the average wind direction and strength at Filton



The 30-year rainfall pattern for the closest met office recording station (Cheltenham) is as follows:

Table 2.1 Rainfall (Cheltenham 1991-2020)

Month	Rainfall (mm)	Days of rainfall ≥ 1 mm (days)	Days of rainfall ≥ 1 mm (%)
Jan	78.0	12.8	3.5%
Feb	65.8	11.0	3.0%
Mar	51.3	10.7	2.9%
Apr	69.2	11.4	3.1%
May	65.5	11.0	3.0%
Jun	71.3	10.5	2.9%
Jul	70.7	10.7	2.9%
Aug	72.3	11.2	3.1%
Sep	69.2	10.2	2.8%
Oct	80.5	12.6	3.4%
Nov	88.8	13.7	3.8%
Dec	84.8	13.4	3.7%
Annual	867.2	139.0	38.1%

3 Site Operations

A plan showing the total area to be recontoured is shown in **DEMP1** 'Site Setting and Receptor Locations'.

3.1 General Operations

The use of waste for the proposed agricultural land improvement works constitutes a recovery operation with 'waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function' (EC Guidance on Directive 2008/98/ED on Waste). The recovery operation is the proposed use of inert waste to improve an area of formerly quarried land which was not properly restored and is not as productive as the surrounding land which was not quarried.

The groundworks would take place over a period of approximately 18 to 24 months at a rate of importation of 45,000tpa over the total area of 5.9Ha. The traffic generation for this would be an average of 20 lorry movements per day. All existing surface materials will be retained for use in the site works. The average depth of fill across the site is approximately 1m.

The materials that are required are those which can be 'modelled' to a suitable landform. Any materials received which are suitable for use as topsoil will be separately retained and used in the final surface layers.

The proposed waste types are shown below:

- **EWC Code 01 01 02:** Wastes from mineral non-metalliferous excavation (overburden & interburden waste only)
- **EWC Code 01 04 08:** Waste gravel and crushed rocks
- **EWC Code 01 04 09:** Waste sand and clays
- **EWC Code 02 04 01:** Soil from cleaning and washing beet
- **EWC Code 17 05 04:** Soil and stones (restricted to topsoil, peat, subsoil and stone only)
- **EWC Code 19 12 12:** Soil substitutes other than those containing dangerous substances only
- **EWC Code 20 02 02:** Soils and stones (restricted to topsoil, peat, subsoil and stone only)

3.2 Operational 'Zones'

There are no operational 'zones' proposed at the site, however IAQM dust risk assessment guidance suggests that for a site which has receptors at one end of a 'rectangular' boundary, it is appropriate to consider the site as different areas with different risk factors. As such, for purposes of this DEMF two areas may be identified with different risk factors:

- 'DEMP Zone 1' the area within 100m of receptors.
- 'DEMP Zone 2' the area further than 100m of receptors.

The location of these 'DEMP Zones' can be seen in **DEMP1** 'Site Setting and Receptor Locations'.

- **DEMP Zone 1** covers approximately 1.8Ha (30.7% of the total area within the red line application boundary) and is within 100m of the 3 assessment receptors; and
- **DEMP Zone 2** covers approximately 4.1Ha (69.3% of the total area within the red line application boundary) and is greater than 100m of the 3 assessment receptors.

3.3 Hours of Operation

The approved working hours are:

- 08:00 to 18:00 hours Monday to Friday;
- 08.00 to 13.00 on Saturdays; and
- No working on Sundays.

3.4 Material Deliveries

All materials are delivered in HGVs, with up to 20 per day expected construction projects in the locality. The material will arrive on the A38, from either direction.

3.5 Overview of Dust Controls

A range of routine mitigation / control measures are used day-to-day under normal operating conditions in the absence of any unusual risk factors.

Key measures include:

- Speed limit of 10mph on internal haul routes; and
- Adequate water supply maintained for use of bowser, where required; and
- Road sweeper for paved routes including A38.

3.6 Dust Suppression

A water bowser is available should visual observation of the site result in the requirement for dust suppression (i.e. hot and windy days).

The control of dust and particulate emissions from the facility is the overall responsibility of the site manager and plant operator. Any activities causing excessive emissions from the facility are immediately suspended until the bowser is used.

Should significant volumes of fugitive dust and particulates escape into the surrounding environment as a result of a particular activity, control measures detailed above would then be applied until the dust levels return to normal and the activity will be reviewed in order to prevent re-occurrence.

3.7 Containment

Due to the nature of the recontouring proposals, it is not possible to contain emissions of dust.

3.8 List of Plant

The Non-Road Mobile Machinery (NRMM) is limited to a single shovel / bulldozer operating at any one time.

4 Dust Risk Assessment

4.1 Guidance

There are no statutory limit values for dust deposition above which ‘nuisance’ is deemed to exist – ‘nuisance’ is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred. Guidance for the control and monitoring of dust from construction sites has been produced by the IAQM and others:

- IAQM (2016) *Guidance on the Assessment of Mineral Dust Impacts for Planning*;
- IAQM (2014) *Assessment of dust from demolition and construction*;
- IAQM (2018) *Air Quality Monitoring in the Vicinity of Demolition and Construction Sites 2018*;

This guidance document provides site evaluation guidelines based upon the size in square metres (or number of properties) of a development to rate the application site between a low risk to high risk once local sensitivity has been taken into account.

The Environment Agency Guidance M17 monitoring of particulate matter in ambient air around waste facilities is of relevance, although it does not include a risk ranking methodology such as that in the IAQM construction guidance, its focus instead being on the available monitoring methods for waste facilities.

These are overarching guidance documents which pull together the available techniques for assessment and monitoring. The IAQM documents underpin the approach taken in this dust risk assessment.

4.2 Professional Judgement: Qualifications

The Institute of Air Quality Management requires that the assessment of dust risk should be undertaken but a suitably qualified and experienced air quality specialist. This risk assessment has been completed by Matt Stoaling, Director of Isopleth Ltd which is an independent air quality consultancy. Matt Stoaling is a Fellow of the Institute of Air Quality Management (IAQM), a Member of the Institute of Environmental Science (IES) and a Chartered Environmentalist. He has been a practising air quality and odour specialist for over 23 years. During this time he has provided air quality, dust and odour advice and services to a range of industry sectors and clients, including the solid waste, waste water, minerals and agriculture industries. He has also worked on behalf of local authority and government agencies advising on dust and odour issues, including documents relating to dust and odour assessment published by the Environment Agency, Sniffer and the Institute of Air Quality Management^{4, 5, 6}.

⁴ IAQM (2016) *Guidance on the Assessment of Mineral Dust Impacts for Planning*.

⁵ IAQM (2014) *Assessment of dust from demolition and construction*.

⁶ IAQM (2018) *Air Quality Monitoring in the Vicinity of Demolition and Construction Sites 2018*

4.3 Approach

As with any potentially dust generating activity, the risk of dust emissions from the site causing loss of amenity and/or health or ecological impacts is related to the 'residual source emission', a function of:

- the activities being undertaken (demolition, number of vehicles and plant etc.);
- the duration of these activities;
- the size of the site; and
- the meteorological conditions (wind speed, direction and rainfall).

Consideration of these issues allows the assessor to determine the Source-Pathway-Receptor risks, and this is a standard approach used in the IAQM construction dust and IAQM minerals dust guidance documents, for example.

The assessment methodology considers three separate dust effects:

- annoyance due to dust soiling;
- harm to ecological receptors; and
- the risk of health effects due to a significant increase in exposure to PM₁₀ (including the smallest fractions)

Risks may be described in terms of there being a low, medium or high risk of dust, based largely on professional judgement. Mitigation measures are identified where necessary and significance of dust effects determined following such mitigation. It is recognised that the site as a whole includes sources with the potential to emit dust. However, the aim of the risk assessment section of this management plan is to enable consideration of individual sources / activities (referred to as 'zones'), understand their potential for impacts and significant effects before mitigation is applied, which can then inform the mitigation and monitoring strategy described in this document.

4.3.1 Pathway

For a site (or zone) with the given residual source emission the potential for release of dust from the site and transport to a potentially sensitive receptor location will be governed by the frequency of potentially dusty winds as well as the pathway effectiveness (i.e. distance to receptor).

The IAQM table below provides examples of the wind speed categories.

Table A3-2. Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

The ‘pathway effectiveness’ is then determined from the wind speed categories above and the distance to receptors.

For purposes of this assessment and based on the nature and characteristics of the recontouring material, the categories used are:

- Close: <50m;
- Intermediate: 50m - 100m;
- Distant: >100m

The pathway effectiveness is then determined using the matrix below.

Table A3-4. Pathway Effectiveness

		Frequency of potentially dusty winds			
		Infrequent	Moderately frequent	Frequent	Very frequent
Receptor Distance Category	Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

4.3.2 Dust Impact Risk

The pathway effectiveness may be combined with the residual source emissions from a particular ‘zone’ (or ‘zones’) to define the overall dust impact risk from a zone, as shown in the IAQM table below.

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

4.3.3 Magnitude of Effects

The overall ‘magnitude of effect’ will therefore result from:

- the proximity of receptors to the activities;
- the sensitivity of the receptors to dust;
- the dust impact risk; and
- the adequacy of the mitigation measures applied to reduce or eliminate dust.

The effect will always be adverse (when not negligible) and only ‘moderate adverse’ or ‘substantial adverse’ effects are considered to be ‘significant’ according to the IAQM risk assessment method.

Table A3-6. Descriptors for magnitude of dust effects

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

4.4 The Sensitivity of the Area

As described above, the nearest neighbouring receptors that could be adversely affected by dust emissions from the recontouring operations are:

- The Fromebridge Service Station;
- Fromebridge Cottages / Horseshoe Cottage; and
- Netherhills Cottage.

These are all ‘high sensitivity’ receptors. A plan of the site showing the distance

to receptors is included as **DEMP1** 'Site Setting and Receptor Locations'.

4.5 DEMP Zone 1: Northern Area

The location of this 'zone' can be seen in **DEMP1** 'Site Setting and Receptor Locations'. The total surface area of the zone is 18036m², accounting for 30.7% of the total area of the site.

4.5.1 Nature of Source

The key risks for dust generation in DEMP Zone 1 are from:

- 1 windblow of materials carried by (and deposited by) HGVs;
- 2 'Trackout' where dust and dirt from the site is carried on HGVs (such as on the tyres), where it may be deposited and then re-suspended by vehicles using the same route; and
- 3 Recontouring (i.e. use of shovel to profile the land).

4.5.2 Residual source emissions

The internal access / egress road at the site is expected to see approximately 20 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content). The paved road length will be >100 m with only a small unpaved length into the deposition area itself. The residual source emission from this source is therefore '**medium**' before mitigation is applied in relation to dust from the haul road.

As the material used in the recontouring will not be homogenous, the particular size and moisture content is expected to be variable, within the ranges expected for the relevant EWC codes. The residual source emission from recontouring is considered to be '**medium**' before mitigation is applied. Given the relative site area of DEMP Zone 1 it is only likely to be filled for approximately 30% of the (maximum) 2 year total recontouring period, accounting for approximately 7-8 months.

4.5.3 Pathway Effectiveness

The frequency of wind towards each receptor is shown below.

Table 4.1 Pathway effectiveness

Rec	Distance (m)	Directions	% of Year (all)	% of Year (dry)	Class
1	<50m	060 – 240	18.2	11.2	Moderately Frequent
2	<50m	100 – 170	9.9	6.2	Moderately Frequent
3	<50m	150 - 180	6.1	3.8	Infrequent

As the receptors are (at worst) 'close' to zone 1 the pathway is 'moderately

effective' for receptors 1 and 2 and 'ineffective' for receptor 3.

The pathway effectiveness is compared with the residual source emission to determine the dust impact risk for each zone and receptor. When filling in DEMP Zone 1 there is a 'medium' dust impact risk for receptors 1 and 2 and 'low' dust impact risk for receptor 3.

As the receptors are (at worst) 'close' to zone 1 the pathway is 'moderately effective' for receptors 1 and 2 and 'ineffective' for receptor 3.

4.5.4 Dust Impact Risk and Effect Summary

The dust impact risk before mitigation is applied is shown below. As per the approach detailed above, this relates to the point closest to the zone (distance) and all potentially effective wind directions.

The overall dust impact risk from DEMP zone 1 assuming 'medium' residual source emissions is therefore:

- The Fromebridge Service Station: **Low Risk**
- Fromebridge Cottages / Horseshoe Cottage: **Low Risk**
- Netherhills Cottage: **Negligible Risk**

The magnitude of dust effects from zone 1 assuming 'medium' residual source emissions is therefore:

- The Fromebridge Service Station: **Slight Adverse Effect**
- Fromebridge Cottages / Horseshoe Cottage: **Slight Adverse Effect**
- Netherhills Cottage: **Negligible Effect**

4.6 Zone 2: Southern Area

The location of this 'zone' can be seen in **DEMP1** 'Site Setting and Receptor Locations'. The total surface area of the zone is 40761 m², accounting for 69.3% of the total area of the site.

4.6.1 Nature of Source

The key risks for dust generation in DEMP Zone 2 are from:

- 4 windblow of materials carried by (and deposited by) HGVs;
- 5 'Trackout' where dust and dirt from the site is carried on HGVs (such as on the tyres), where it may be deposited and then re-suspended by vehicles using the same route; and
- 6 Recontouring (i.e. use of shovel to profile the land).

4.6.2 Residual source emissions

The internal access / egress road at the site is expected to see approximately 20 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content). The paved road length will be >100 m with only a small unpaved length into the deposition area itself. The residual source emission from this source is therefore **'medium'** before mitigation is applied in relation to dust from the haul road.

As the material used in the recontouring will not be homogenous, the particular size and moisture content is expected to be variable, within the ranges expected for the relevant EWC codes. The residual source emission from recontouring is considered to be **'medium'** before mitigation is applied. Given the relative site area of DEMP Zone 2 it is likely to be filled for approximately 70% of the (maximum) 2 year total recontouring period, accounting for approximately 16-17 months, with a significant proportion of this time (over half) being in areas over 200m from the receptors.

4.6.3 Pathway Effectiveness

The frequency of wind towards each receptor is shown below. Receptor 1 have been assigned a different proximity score for filling of DEMP Zone 2 and the haul road which runs adjacent to this property.

Table 4.1 Pathway effectiveness

Rec	Distance (m)	Directions	% of Year (all)	% of Year (dry)	Class
1	>100m (filling)	000 - 240	15.2	9.4	Moderately Frequent
	<50m (road)	000 - 240	15.2	9.4	Moderately Frequent
2	>100m	020 - 200	2.5	1.6	Infrequent
3	>100m	150 - 210	1.9	1.2	Infrequent

As the receptors are (at worst) 'close' to zone 2 the pathway is 'moderately effective' for this receptor. The pathway is 'ineffective' for receptors 2 and 3.

The pathway effectiveness is compared with the residual source emission to determine the dust impact risk for each zone and receptor. When filling in DEMP Zone 2 there is a 'medium' dust impact risk for receptor 1 and 'low' dust impact risk for receptors 2 and 3.

4.6.4 Dust Impact Risk and Effect Summary

The dust impact risk before mitigation is applied is shown below. As per the approach detailed above, this relates to the point closest to the zone (distance) and all potentially effective wind directions.

The overall dust impact risk from DEMP zone 2 assuming 'medium' residual source emissions is therefore:

- The Fromebridge Service Station: **Low Risk**
- Fromebridge Cottages / Horseshoe Cottage: **Negligible Risk**
- Netherhills Cottage: **Negligible Risk**

The majority of risk for the Fromebridge Service Station is from the haul road which runs adjacent to this property.

The magnitude of dust effects from zone 1 assuming 'medium' residual source emissions is therefore:

- The Fromebridge Service Station: **Slight Adverse Effect**
- Fromebridge Cottages / Horseshoe Cottage: **Negligible Effect**
- Netherhills Cottage: **Negligible Effect**

4.7 Risk Matrix

The dust impact risks and residual effects (before mitigation) are summarised below for each zone.

Table 4.5 Summary Dust Risk Table to Define Site-Specific Mitigation

DEMP Zone	Highest Dust Impact Risk	Worst Effect
1	Low Risk	Slight Adverse Effect
2	Low Risk	Slight Adverse Effect

The site (and zone) specific mitigation described in this DEMP is intended to further reduce the risk of dust emissions from each DEMP zone and therefore the site as a whole.

Table 4.1: Source-Pathway-Receptor Routes

Source	Pathway	Receptor	Type of impact	Where relationship can be interrupted
Vehicles entering and/or leaving the site Vehicles and plant moving around the site / Site surfaces	Tracking dust on wheels and vehicles, then mud dropping off wheels/vehicles when dry Atmospheric dispersion	All receptors (see Drawing DEMP1).	Visual soiling, also consequent resuspension as airborne particulates	Remove mud before vehicles leave site. Use of a road sweeper. Dust suppression on site surfaces
Recontouring (tipping and profiling)	Atmospheric dispersion	All receptors (see Drawing DEMP1).	Visual soiling and airborne particulates	Minimise source strength by means of low drop heights, profiling and shielding of piles from wind whipping.

Table 4.2: SUMMARY: Measures that will be used on site to control dust/particulates (PM₁₀)

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
Preventative Measures			
Site speed limit	Enforcement of a speed limit may reduce re-suspension of particulates by vehicle wheels.	Identified on site signage.	In place from start of operations
Minimising drop heights for imported material	Minimising the height at which imported material is handled should reduce the distance over which debris, dust and particulates could be blown and dispersed by winds	Addressed where it has been considered necessary, and further changes implemented as routine equipment changes made.	If a particular operation has a persistent issue leading to emission off site, changes will be made to reduce dust arising
Good house-keeping	Having a consistent, regular housekeeping regime that is supported by management, will ensure site is regularly checked and issues remedied.	Bowser and road sweeper	Available, used at site manager / operators discretion
Sheeting of vehicles	Prevents the escape of debris, dust and particulates from vehicles as they travel within the site	Already in place for identified loads.	Dependent on load size / nature of material
Ceasing operation during high winds	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.	Responsibility of Site Manager to ensure that the measures described in the DEMP are followed.	When Site Manager assess the conditions to require cessation of any particular element of the site.

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
Remedial Measures			
On-site sweeping	Sweeping could be effective in managing larger debris, dust and particulates. Road sweeping vehicles damp down dust and particulates whilst brushing and collecting dust and particulates	In place from start of operations	Available, used at Site Manager discretion
Water suppression mobile bowser	Damping down of site areas will reduce dust and particulate re-suspension and may assist in the cleaning of the site if combined with sweeping.	In place from start of operations	Available, used at Site Manager discretion

5 Monitoring

5.1 Aims

The aim of the monitoring is to provide the operator with an ongoing qualitative of the effectiveness of the mitigation measures employed at the site. Where monitoring indicates that mitigation is not as effective as desired, the site management must ensure that the measures described in this document are reviewed.

Monitoring takes three forms:

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

5.2 Daily Checks: Visual Monitoring

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

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

The monitoring locations vary around the site depending on the operations that are active at the time of monitoring as not all activities take place all the time. The site manager and plant operators are tasked with recording any emissions and the point at which the monitoring took place.

Daily dust checks are completed and logged. The checks relate to the conditions which may lead to dust release as well as monitoring of the dust itself along and outside, the site boundary. A windsock provides an additional visual guide as to the wind strength and direction. The site staff responsible for this monitoring undertake this daily inspection and record the results. The inspection focusses on the following areas:

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

Should significant volumes of fugitive dust escape into the surrounding environment as a result of the acceptance of a particular load, the control measures detailed above would then be applied until the dust levels return to normal (i.e. water bowser).

5.3 Meteorological Conditions

As noted above, a windsock provides an additional visual guide as to the wind strength and direction. There is no logging site weather station at this time.

5.4 Particulate Matter Monitoring

There is no routine TSP / PM₁₀ monitoring at the site as none has been requested by either the Council or the EA and the site is not located within an AQMA for PM₁₀.

6 Reporting and Complaints Response

6.1 Reporting of Complaints

Any incidents of airborne dust off site or dust complaints will be fully investigated and recorded by the Technically Competent Manager (TCM) including details of any mitigation or remedial actions taken as per the procedures in the management system with the maintenance of the site diary, see Appendix for a copy of the complaint form.

When a dust complaint is received the following actions will be taken by the TCM or nominated substitute -

Immediate Actions:

- Establish if justified - if wind blowing in direction of property, dust seen leaving site (conditions such as rain or wind blowing in opposite direction would indicate not justified).

- Where justified establish source
 - Are there any unusual characteristics evident in the waste on-site (origin of waste, composition, age, condition, etc)?
 - Are/were waste reception processes occurring as per normal?
 - Is/was the dust suppression system working?
 - Are/were there any unusual activities taking place off-site e.g. neighbouring site operations?
 - Cease relevant operation
 - Recommence relevant operation only when actions have been taken to address dust emissions e.g. additional suppression measures, suitable weather conditions, etc

When complaints are received a complaint form will be completed. Complaints will be fully investigated and recorded by the TCM including details of any amendments to plant/procedures, mitigation or remedial actions taken with details recorded in the site diary.

The TCM as part of environmental permitting responsibilities will ensure that the EA is informed of these, ideally as soon as possible practically possible and appropriate. The original complainant will be informed of the outcome of the investigation of the complaint by the TCM and any actions taken within 5 working days.

6.2 Engagement with the Community

Smiths (Gloucester) Limited will liaison with any community stakeholders such as organisations as the local council in response to any issues raised by them in respect of emissions. Smith head offices, located just over a kilometre to the south east of the site, will provide the primary point of contact for the site, telephone 01453 822227.

6.3 Management Responsibilities

Management of dust at the site is the overall responsibility of the TCM who is responsible for the day to day management of the site including the DEMP, its implementation and review.

All site operatives will be informed of the contents of this DEMP and receive appropriate training. Site operatives will be responsible for implementing measures in the DEMP as relevant to their site duties.

7 Continuous Improvement

The TCM will review the site diary⁷ in relation to dust matters together with any complaints, EA inspection records, any monitoring results and available weather station information. The results of review shall be used to assess the need for changes to the DEMP including amending site procedures and further monitoring work if necessary.

Notwithstanding the above, the DEMP will be reviewed annually by the site manager or otherwise in response to a request from a relevant statutory body e.g. EA, changed circumstances such as the operation of new processing plant or substantiated dust complaints.

⁷ The review of the site diary will assist with reviewing retrospective complaints to identify any circumstances which led to that complaint as a result of elements outside of the operator's control that would be able to be attributed (or, at least, in part) to the cause of the complaint.

Appendix – Complaint Form

Complaint Log Site:.....

Date of Incident		Time of Incident		Weather conditions at time of incident	
Date of Complaint		Time of complaint			
Name		Address		Contact details	
Complaint					

Signed:.....

Details of Investigation				
Action Taken				
Future Actions				
Reporting ⁸	Complainant	Site Staff	Management	NRW

Signed:..... (TCM)

⁸ Confirm date, verbal or written.