Deposit for Recovery Scheme Dust Management Plan

Wivenhoe Quarry

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[1] Introduction

[1.1] Report Objectives

This Dust Management Plan (DMP) has been prepared in support of a bespoke permit application for a recovery activity which will be operated by Tarmac Trading Limited (the Operator) to restore the "land to the south of Colchester Main Road (known as Sunnymead, Elmstead and Heath Farms), Alresford, Essex, C07 8DB" (the Site) as required by Planning Permission ESS/17/18/TEN granted by Essex County Council on 18th December 2020.

Planning Permission ref ESS/17/18/TEN has been granted by Essex County Council on 18th December 2020 for the extraction of sand and gravel as an eastern extension to the existing Wivenhoe Quarry, followed by restoration to agriculture and low-level water-based nature conservation habitats, lowland meadow, woodland planting and hedgerow enhancement.

The site is surrounded by a number of features that would be considered receptors. The B1027 bounds the northern perimeter of the extension area and will provide the main access route to the Site. Several residential properties are situated along this road to the north and east of the Site, with the closest situated within 10 metres of the Site boundary to the North. The Site is surrounded predominantly by agricultural land, isolated dwellings, woodland and water bodies. Neighbouring land use include agriculture, specifically arable cropping, with a number of sand and gravel quarries in the wider area.

The sole purpose of this DMP is to identify which aspects of the Deposit for Recovery activity are likely to cause a potentially harmful emission of uncontrolled dust and how these emissions will be minimised. This document follows current Environment Agency guidance[1] for the control and monitoring of emissions and the Dust Emissions Management Plan template (version 10, 2018) compiled by the Environment Agency's Waste and Air Quality Working Group.

This DMP is intended to supplement Vibrock, 2021[2] DMP which is required by Condition 11 of Planning Permission ESS/17/18/TEN for the extension of mineral extraction from at Wivenhoe Quarry West to Wivenhoe Quarry East and stipulates the requirement to adhere to the approved DMP during quarrying activities. Consequently, the quarrying aspect of the Wivenhoe Quarry Extension will not be considered further as part of this DMP. However, as quarrying works will be operated in advance and parallel to the Deposit for Recovery operations there is a consistency between the documents.

A copy of the DMPs will be included in the Site's Environmental Management System (EMS) held electronically on the company's internal database and all members of staff will have access to this document.

This DMP makes reference to the following documentation submitted as part of the Permit application and planning documents for the approved permission ESS/17/18/TEN:

- Vibrock (May 2018) Air Quality Assessment report ref. R18.9705/2/RS
- Vibrock (December 2021) Dust Management Plan report ref. R12.10629/DMP/2/JM
- ByrneLooby (December 2021) Waste Recovery Plan (WRP) report ref. K6008/ENV/R001

[1] Control and monitor emissions for your environmental permit - GOV.UK (www.gov.uk)
[2] Vibrock (December 2021) Dust Management Plan

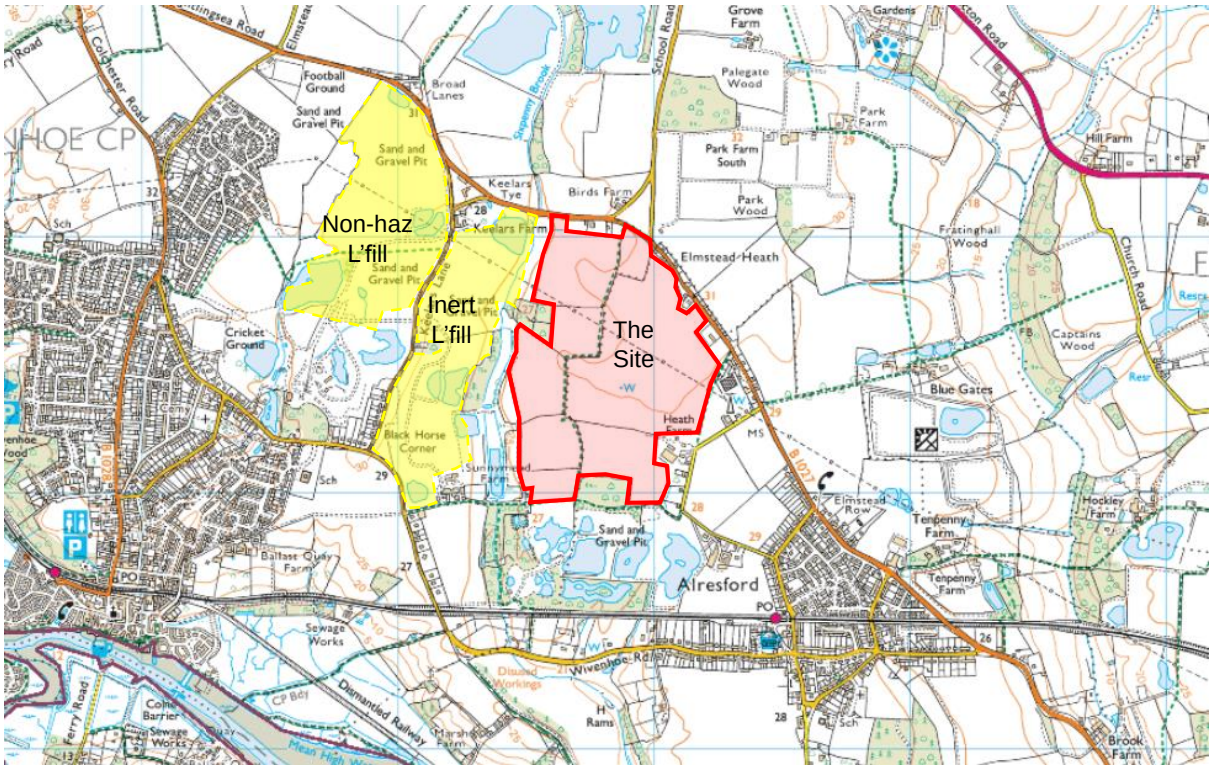
- ByrneLooby (March 2022) Environmental Risk Assessment (ERA) report ref. K6008/ENV/R003
- ByrneLooby (March 2022) Waste Acceptance Procedures (WAP) ref. K6008/ENV/R005

[2] Site Operations

[2.1] Site Location and Proposed Site Activities

Wivenhoe Quarry (East) is situated between Wivenhoe and Alresford at Elmstead Heath, approximately 3.5km to the south-east of Colchester, Essex. The site is located at National Grid Reference (NGR) TM 05855 22582 and shown on Figure 1.

Figure 1 – Site Location and Surrounding Features



Inert L'fill = Mapped Inert Landfill EPR/3194LV. Non-haz L'fill = Mapped Biodegradable Landfill EPR/PP3199NN in operational quarry (Note landfill's are smaller than permitted /licensed areas)

The B1027 bounds the northern perimeter of the Site and will provide the main access route to the extension area. Several residential properties are situated along this road to the north and east of the Site. The Site is surrounded predominantly by agricultural land, isolated dwellings, woodland, former quarries, which have in part been restored as landfill as well as to water bodies.

The site covers an area of ~60.9ha and currently exists as agricultural field parcels delineated by hedgerows. The site is bisected by a Public Right of Way (footpath), which is an important recreational asset to the area around the site and a series of overhead power lines. The topography of the site rises from ~27mAOD along the western edge of the site to ~30mAOD within the central part of the site. Towards the north-east the ground elevation remains relatively flat. There is a fall in topography towards the south-east of the Site near Cockaynes Wood with elevations at Willow Lodge at ~27.5mAOD. The site topography is illustrated on Drawing W328-

00062-02-D.

The proposed extraction area covers 43.4ha. Details of the proposed working scheme including the application boundary and proposed extraction area are illustrated on Drawing W328-00062-03-D.

[2.2] Proposed Site Activities

The site is being developed as an extension to the existing Wivenhoe Quarry for the extraction of approximately 3.8 million tonnes of sand and gravel. The historical quarry and proposed extension are physically separated by the Sixpenny Brook, which hydrogeologically separates the two schemes. The site is set out within the Essex Minerals Local Plan as a “Preferred and Reserve Site” which provides “particular opportunities for new habitat areas”. The proposed mineral extraction zone covers an area of ~43.4ha and it is this area which will concern the recovery activity. The quarry will be developed in a phased manner in accordance with the requirements of the Planning Permission as illustrated on Drawing W328-00062-03-D.

The site is to be restored to a mixture of agriculture and low-level water-based nature conservation habitats, lowland meadow, woodland planting and hedgerow enhancement using approximately 1.2 million cubic metres of imported inert materials. The imported material quantity is expected to be approximately a third of the intended extractable mineral, which will be used to supplement on-site excavated materials i.e. quarry overburden and interburden. Therefore, the quantity of imported material required will be dependent on the proportion of recovered mineral. Materials will be imported throughout the operational period of the quarry at a rate proportional to the mineral output. The approved restoration scheme for the site including final ground contours is illustrated on Drawing W328-00062-12-D.

The Site will be operated and managed by Tarmac Trading Ltd with a well-established Site Environmental Management System (EMS) in place which includes procedures for the maintenance and cleaning of access routes to and from the Site in addition to waste acceptance procedures and handling techniques.

The site is not located within 2km of an air quality management area (AQMA) for PM_{10}.

[2.3] Site Access & Primary Infrastructure

The site has a single point of access to the B1027 public highway with a wheel washing and underside chassis cleaning facility provided for all outgoing haulage vehicles, prior to the site exit to ensure mud or dust are not carried onto the public highway.

[3] Potential Dust Emission Sources

[3.1] On-Site Emission Sources

A summary of the inert wastes to be brought onto site as part of the recovery activity and where it is to be delivered is shown below in Table 1.

Table 1 – Destination and Waste Types

General Waste Description	Tonnage per Year	Location
Inert & non-hazardous (non-biodegradable) soils and excavations wastes	114,000 per year	Direct to Quarry Void

As far as reasonably practicable, wastes will be deposited directly to the quarry void. Stockpiling of incoming wastes will occur only under exceptional circumstances and on a temporary basis, with all waste stockpiling to be undertaken within the quarry void.

The waste materials to be used for restoration of the site will be predominantly sourced from local development projects. It is anticipated that a significant proportion of the material accepted will originate from greenfield excavations. The bulk of the wastes to be accepted at the site will comprise excavated soils and fall under EWC codes

- 17 05 04 "*Soils and stone other than 17 05 03*"; and
- 20 02 02 "*Soil and stones*".

Fugitive dust emissions can potentially arise from the following site activities:

- Transport of waste to site;
- Unloading / deposition of waste material;
- Wind-blown dust accumulated on site surfaces; and,
- Vehicle movements on dusty roads.

Fugitive dust emissions may present a dust nuisance to surrounding human receptors or cause an adverse impact if excessive deposits settle on sensitive habitats. Additionally, smothering of sensitive plant life or surface water receptors can occur if sediment is able to accumulate.

The potential for fugitive emissions during Recovery operations are expected to be consistent with emissions during quarrying operations.

[3.2] Control Measures for On Site Dust Emissions

Site staff at the weighbridge will enforce strict waste acceptance protocols to manage the deposit of potentially dusty materials. On site verification of wastes will also be undertaken as loads arrive on site consisting primarily of reviewing associated paperwork. If the load is suspected of containing potentially dusty waste, an inspection of the load will be carried out if possible. Any excessively dusty or friable materials that could potentially cause emissions of fugitive dust will only be accepted if the waste is conditioned with water prior to or during deposition.

The operator may restrict or suspend activities most likely to generate dust, or refuse inputs that may contain excessive quantities of loose, light material.

All vehicles will use wheel and underside chassis cleaning facilities to prevent mud and dust being deposited on the public highway. The facility will be appropriately maintained to ensure its effectiveness. Site staff at the weighbridge will check departing vehicles to ensure correct use of

the vehicle washing facilities occurs at all times and will direct vehicles back through the wheel wash if they do not consider the vehicle to be clean.

All vehicles transporting materials to and from Site will be arrive at site sheeted and remain so until tipping within the quarry void. Internal haul roads will consist of compacted material, regularly maintained by grading to minimise the generation of dust.

The on-site speed limit of 10mph will be enforced and internal site roads will be maintained, with signage clearly visible along all access roads. If necessary, a tractor with a water bowser and/or road sweeper will be used to help minimise dust emissions from the operation, with access to all areas of the site to be maintained. The condition of the site haul road and entrance road will be observed as part of the regular site walkover checks. Any problems observed will immediately be reported to the Site Manager (or nominated deputy) who will be responsible for implementing any necessary remedial plan.

Limited stockpiling will be conducted with the incoming inert material to be placed directly into the quarry void and compacted upon arrival. Where stockpiling is deemed necessary, this will occur only within the quarry void.

Consideration will be given to the selection of the deposition area in respect of the prevailing wind direction so as to minimise exposed areas. Site operatives supervising deposit of the material will be in constant communication with the weighbridge to advise them if dusty loads incorrectly described by the supplier have been accepted. Restrictions will be imposed on the deposition during excessively dry and windy conditions for example, if during dry conditions wind-blown dust is observed to be a problem, haul roads and areas of waste deposition will be wetted down.

Any problems observed will immediately be reported to the Site Manager (or nominated deputy) who will be responsible for implementing any necessary remedial plan.

Mitigation in the form of bunding and separation distances have been built into the design of the development, with topsoil, subsoil and overburden placed as a bund to provide screening for surrounding receptors during the quarrying phase of the extension development. These bunds have and will continue to be seeded immediately following placement.

Restored areas will be seeded as soon as is practicable. The progressive restoration of the site will help to reduce the area of land exposed to wind.

Implementation of the DMP will be the responsibility of the Site Manager (or nominated deputy). It will form part of the Site Environmental Management System (EMS) and will therefore be part of the staff induction process ensuring staff competency. Internal audits of the management system will be undertaken regularly to ensure the training needs of site staff are met. All employees will receive formal training of the contents of this DMP.

The DMP Plan will be subject to periodic review should it be required.

[3.3] Remedial Actions for On-Site Dust Emissions

In the unlikely event that unacceptable dust emissions arise from site operations or vehicle movements, the following remedial actions will be considered and where deemed appropriate, undertaken:

- Operations deemed to be generating excessive off-site dust will be reduced or suspended until effective remedial actions have been taken or weather conditions deemed to be causing the unacceptable dust levels, improve;
- Additional dust suppression including use of tractor and water bowser will be employed onto affected areas of the site;
- Speed limits may be reduced;
- Where practicable, alternative routes for vehicular movement will be considered to reduce the impact of dust on receptors at risk;
- Additional cleaning of vehicles at the site wheel wash will be required where deemed necessary to avoid dust being emitted on the public highway. A mobile pressure washer will be made available for drivers;
- Waste acceptance and handling procedures will be reviewed if re-consideration of incoming wastes and/or its placement is required;
- Should a complaint be received, the complaints process details in Section [7.3] below will be implemented and the appropriate investigation and corrective actions will be undertaken. Checks will be undertaken during the regular site walkover surveys;
- The management and monitoring of dust and associated checks will be maintained in the site log for periods of adverse weather and the appropriate check sheet. A copy of the Daily Dust Check Sheet is provided in Appendix A. This record will include the following details: a record of all dust events including date, time and the cause of the problem; a record of all complaints; details on action taken and any subsequent changes to operational procedures.
- As described within the Site's EMS Summary, an environmental occurrence/non-conformance reporting system has been implemented by Tarmac to enable the efficient documentation, investigation and mitigation to occur and initiate corrective and further preventative actions.

Should a complaint be received, monitoring of dust emissions using a frisbee type deposit dust gauge may be undertaken as per the quarrying DMP, should it be deemed necessary.

[4] Potential Pathways

[4.1] Airborne Pathways

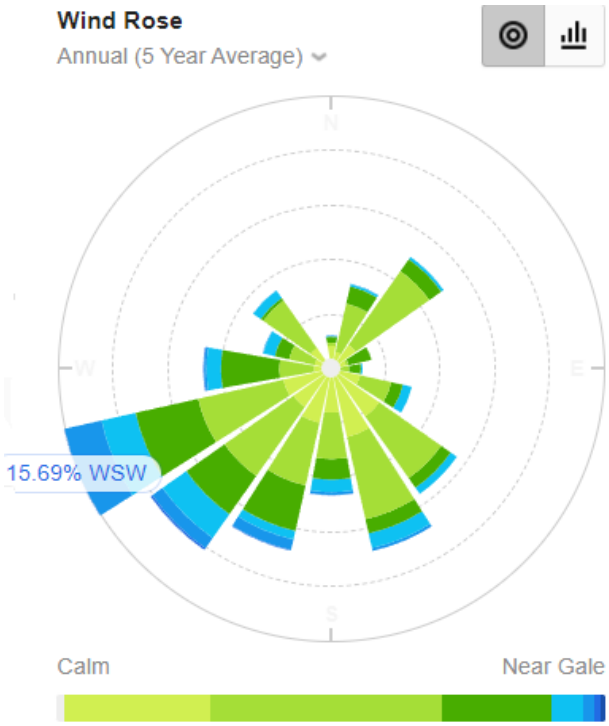
[4.1.1] Meteorological Conditions

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.

Wind statistics are taken from the Alresford weather station[3] for a 5-year period (Figure 2) and have been used to determine the prevailing wind direction for the Site. The windrose shows that the dominant wind direction is from the west southwest towards the east northeast.

[3] Alresford Wind Forecast, Essex CO7 8 - WillyWeather

Figure 2 – Wind Rose for Alresford Weather Station



[5] Potential Sensitive Receptors

[5.1] 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. Recent wind direction from Alresford has been used to establish hazard pathways to adjacent to the site.

The 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.

A review of the sensitive receptors has been completed in relation to the site and have been listed in Table 2 below. The nearest sensitive receptors to the site are identified in Figure 3.

The frequency the wind blows toward potentially sensitive receptors is detailed in Table 2.

In accordance with the Environment Agency guidance template[4] for dust management, receptors within a 1km of the site boundary are likely to be impacted by dust emissions have been considered.

A review of other local sources of dust and particulates has been completed in relation to the site is shown in Table 3. These are considered low risk receptors due to their nature and potential to generate dust.

[4] Environment Agency Example Dust and Emissions Management Plan vr 9.

Table 2 – Sensitive Receptors within 1km of Wivenhoe Quarry Site boundary

Receptor Reference	Receptor	Category	Direction from Site	Approximate distance from the site boundary (m)	Frequency Downwind (%)
1	Cockaynes Wood	Priority Habitat	S	<10	1.9
2	Sixpenny Brook	Watercourse	W	<10	1.8
3	B1027 road	Public Highway	N	<10	7.3
4	Englishes Farm and Rosedene	Residential	N	<10	7.3
5	The Fieldings & adjacent properties	Residential	NE	15	12.7
6	Wilwyn and adjacent properties	Residential	E	15	7.4
7	Willow Lodge and adjacent properties	Residential	E	<10	7.4
8	Furzedown	Residential	SW	<10	7.8
9	Piggery	Agriculture	W	<10	1.8
10	Mitchells Farm Shop	Commercial	NE	55	12.7
11	Direct Animal Feeds / Shrublands Nursery	Industrial / Commercial	E	15	7.4
12	Garage	Industrial / Commercial	E	10	7.4
13	Sunnymead Farm / Scott's Sandwiches	Agriculture / Commercial	W	230	1.8
14	Keelars Farm	Agriculture / Residential	W	310	1.8
15	Sibbons Plant and Sales	Industrial / Commercial	NW	280	8.8
16	Alresford	Residential / Commercial	SE	285	5.5
17	Railway Line	Railway	S	430	1.9
18	Properties of Keelars Lane	Residential	W	340	1.8
19	Footpaths	Public Right of Way	Surrounding Site	<10-500	1.8-15.7
20	Villa Wood	Priority Habitat	SW	25	7.8
21	Park Wood	Priority Habitat	NE	460	12.7
22	Park Farm South	Agriculture / Residential	NE	580	12.7
23	Wivenhoe Road	Public Highway	S	590	1.9
24	Wivenhoe Gravel Pit (SSSI)	Priority Habitat	NW	640	8.8
25	Blue Gates Cottages	Residential	E	780	7.4
26	Upper Colne Marshes (SSSI)	Priority Habitat	SW	860	7.8
27	Grove Farm	Agriculture / Commercial	NNE	860	10.7
28	Tenpenny Brook	Watercourse	E	900	7.4
29	School Road	Public Highway	N	270-1000	7.3

Figure 3 – Location of Sensitive Receptors[5]

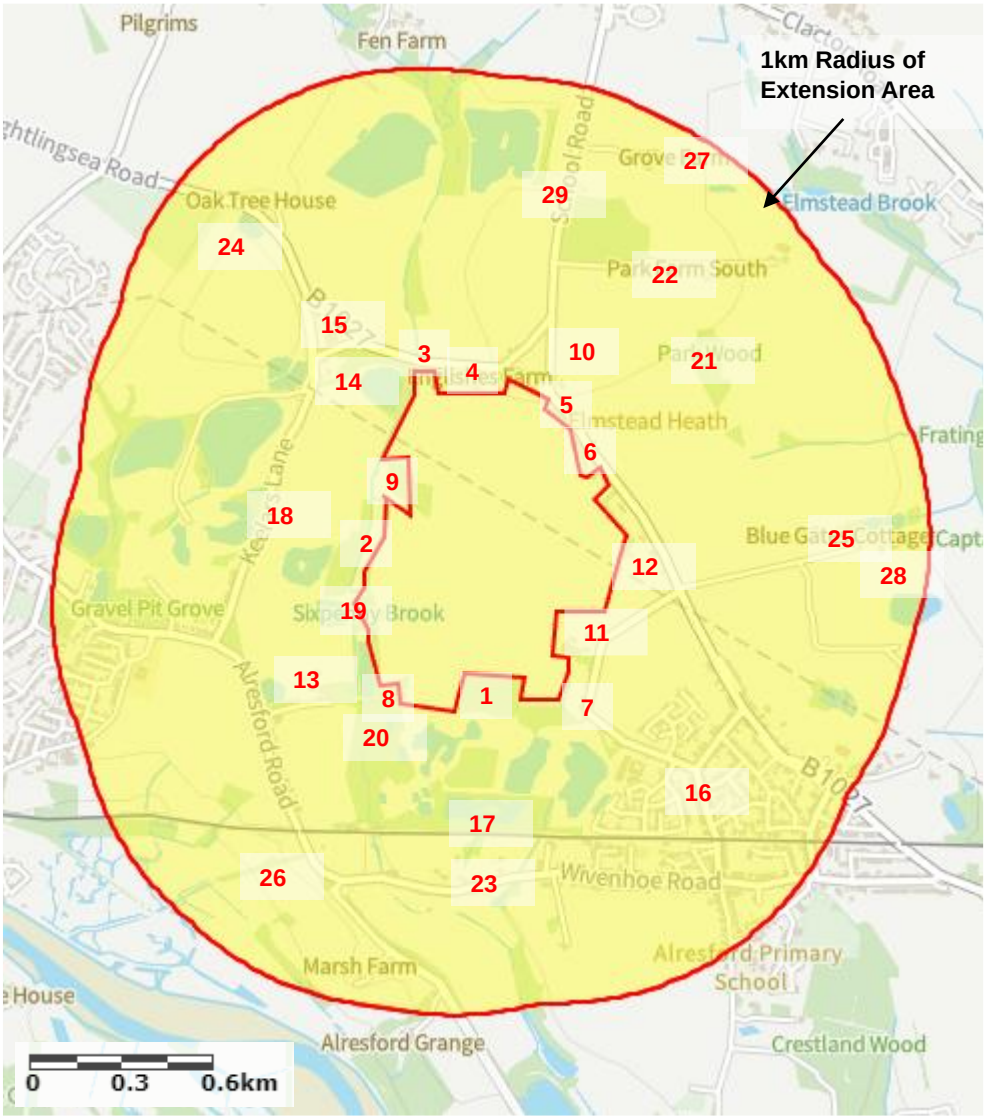


Table 3 – Other Local Sources of Dust and Particulates

Address and Table 2 Receptor Reference	Type of Business	Approximate distance from the site boundary (m)
Wivenhoe Quarry East	The Site – Quarrying operations	0
B1027 Road (3)	Public Highway	<10
Sunnymead Farm (13)	Agriculture/Commercial	230
Keelar's Farm (14)	Agriculture/Residential	310
Wivenhoe Road (23)	Public Highway	590
Grove Farm (27)	Agricultural/Commercial	860
School Road (29)	Public Highway	270-1000
Brett's Aggregates and Brett Concrete	Commercial	1600

[5] MAGIC (defra.gov.uk)

The Fieldings and adjacent properties are the closest receptor to the site (15m to the northeast, “Receptor 5” on Figure 3 and Table 2 – Sensitive Receptors within 1km of Wivenhoe Quarry Site boundary) with the greatest percentage of prevailing wind frequency (12.7%).

[5.2] Receptor Types

[5.2.1] Protected Species, Habitats, Watercourses and Waterbodies

A search of designated sites within 2km of the site was conducted using the Environment Agency’s Magic Maps website[5]. Four sites have been identified during the search, , none of which are within 100m of the site:

- Wivenhoe Gravel Pit (SSSI), 640m northwest of the Site (Receptor 24);
- Upper Colne Marshes (SSSI) 860m southwest (Receptor 26);
- Colne Estuary (SSSI, SPA and Ramsar Site) ~1.3km to the south (off map - Figure 3); and
- Colne Local Nature Reserve (LNR) 2km to the northwest (off map - Figure 3).

All designated sites, with the exception of Wivenhoe Gravel Pit are located upwind or downwind of the site and downwind at a frequency of less than 8%. It is therefore considered that these protected sites low risk receptors of dust emissions from the Site. Wivenhoe Gravel Pit is located crosswind of the site and is downwind only 8.8% of the time, based on the 5-year average. It is therefore considered that with appropriate dust control measures, this receptor would also be considered a low-risk receptor of dust emissions from the Site.

The site is located in close proximity to Priority Habitat in the form of Deciduous Woodlands (including Cockaynes and Villa Woods) and Traditional Orchards, including that found on the northern site boundary. Cockaynes Woodland which is an area of designated Ancient woodland managed by the Essex Wildlife Trust and the Cockaynes Wood Trust. The Sixpenny Brook flows north to south adjacent to the western boundary of the Site and passes through the Cockaynes Wood nature reserve.

The Sixpenny Brook flows into the Colne Estuary approximately 1.2km south east of the site.

As part of the site’s most recent planning application (ESS/17/18/TEN), the Wivenhoe Quarry Extension was subject to a number of habitat and species-specific surveys and accompanying Ecological Impact Assessment (EcIA)[6].

No evidence of European Water Voles was recorded during these surveys in 2015 and 2018 including within the adjacent Sixpenny Brook on the western boundary of the site. The EcIA concluded that the Sixpenny Brook was of ‘low suitability’ for Water Voles and recommended that no further surveys were necessary at the Site. Notwithstanding this, it was recommended that a 10m buffer between the site and the Sixpenny Brook is maintained to avoid the potential for pollutants to be collected within surface run-off and enter the watercourse.

No waterbodies were identified within the proposed extension area and therefore habitats suitable for Great Crested Newts were not present. Consequently, surveying was focused on the 33

[6] Crestwood Environmental (March, 2019) Ecological Impact Assessment (EcIA)

waterbodies identified within 500m of the Site. Two ponds within this radius identified great crested newts and therefore it was recommended that although these will not directly be affected by the proposed extension, a 10m buffer zone between the working area and the inner edge of field margins is maintained throughout the development of the site to avoid disturbance of the Great Crested Newt population identified in these locations. With this mitigation in place, it was concluded that the loss of habitat at the Site is minimal. Moreover, with the emplaced mitigation measures specified in Table 4 below, the loss of habitat resulting from the deposit for recovery activity is also considered to be minimal, with the intention of creating a net larger habitat rich area.

[5.2.2] Residential, recreational, industrial and commercial premises

The potential emissions from the site are likely to have a similar impact on persons occupying residential, recreational, industrial and commercial premises within 1km of the Site.

Exposure of emissions to persons at industrial / agricultural or commercial premises may be lower 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 similar to the site as specified in Table 3.

Fine dust particulates may be able to travel further than larger particles that may 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 such sufficient quantities that a plume would be visible beyond the site boundary. The proposed working hours will be similar to surrounding business and may affect persons in residential housing but have little effect on persons in businesses operating to normal working hours e.g. 0900 to 1700.

The only receptors that are classed as significant, (i.e. residential) at a distance of <150m from the proposed site activities, at a frequently “downwind” location are The Fieldings and adjacent properties. For conservatism this management plan 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 listed in Table 4, distance and the prevailing wind direction prevent most potentially harmful emissions from reaching receptors.

[5.2.3] Highways and Footpaths

The closest receptors to the Site with regards to road users and pedestrians using the B1027 road (<10m) which can be downwind of the site between 7.3-15.7% of the time. Road receptors present their own source of dust and particulates and therefore are unlikely to be sensitive to dust emissions, however users could be at risk of reduced visibility created by dust emissions from the site. Pedestrians using the footpath surrounding the site (<10m at it’s closest point) too are at risk of dust emissions.

The control measures listed in Table 4 are designed to reduce the risk of exposure to these most sensitive receptors, with the risk reduced from high to low with their implementation as part of the deposit for recovery scheme.

[6] Dust Risk Assessment

[6.1] Site Dust Emissions

The risk potential to each receptor as identified in Section [5] from dust potentially generated from the site is presented in Table 4 below. This table evaluates the unmitigated risk to sensitive receptors from uncontrolled dust emissions and the control measures to be implemented at the site in order to minimise and mitigate this risk, producing a revised residual risk to receptors.

A low “residual risk” is detailed for all potential receptors in the vicinity of the site based on the appropriate risk management measures adopted.

Table 4 - Fugitive Dust Emission Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of Exposure	Unmitigated Consequence	Unmitigated Risk	Risk Management	Mitigated Risk
	No.	Dist* (m)	Direc[n]	Freq** (%)					
Fugitive dust emissions generated by: Vehicle movements and handling of waste on site	1	<10	S	1.9	High – close proximity to Site, occasionally downwind	Medium – potential deposition on sensitive vegetation	Medium	Site staff will enforce strict waste acceptance protocols to manage the deposit of potentially dusty wastes. All vehicles will use wheel and underside chassis cleaning facilities to prevent materials being deposited on the public highway. The facility will be appropriately maintained to ensure its effectiveness. Site staff at the weighbridge will check departing vehicles. All vehicles transporting materials to and from Site will be sheeted. All vehicles are to be regularly maintained and enclosed were possible. On site speed limits will be enforced and internal site roads will be maintained. If necessary, a water bowser and/or road sweeper will be used to help minimise dust emissions from the operation. Regular visual inspections will be conducted to ensure that any dust sources are identified and dealt with promptly. Mitigation in the form of bunding and separation distances have been built into the design of the development Restored areas will be seeded as soon as is practicable. The progressive restoration of the site will help to reduce the area of land	Low
	2	<10	W	1.8	High – close proximity to Site, occasionally downwind	Medium – potential accumulation in watercourse	Medium		
	3	<10	N	7.3	High – close proximity to Site, infrequently downwind	High - potential hazardous road conditions	High		
	4	<10	N	7.3	High – close proximity to Site, infrequently downwind	High – dust annoyance to residents	High		
	5	15	NE	12.7	High – close proximity to Site, frequently downwind	High – dust annoyance to residents	High		
	6	15	E	7.4	High – close proximity to Site, infrequently downwind	High – dust annoyance to residents	High		
	7	<10	E	7.4	High – close proximity to Site, infrequently downwind	High – dust annoyance to residents	High		
	8	<10	SW	7.8	High – close proximity to Site, infrequently downwind	High – dust annoyance to residents	High		
	9	<10	W	1.8	High – close proximity to Site, occasionally downwind	Medium – dust annoyance to farmers	Medium		
	10	55	NE	12.7	High – close proximity to Site, frequently downwind	High – dust annoyance to staff	High		
	11	15	E	7.4	High – close proximity to Site, infrequently downwind	Medium – dust annoyance to staff	Medium		
	12	10	E	7.4	High – close proximity to Site, infrequently downwind	Medium – dust annoyance to staff	Medium		
	13	230	W	1.8	Medium – proximity to Site, occasionally downwind	High – dust annoyance to staff	Medium		
	14	310	W	1.8	Low – distance from Site, occasionally downwind	High – dust annoyance to residents	Medium		
	15	280	NW	8.8	Medium – proximity to Site, infrequently downwind	Medium – dust annoyance to staff	Medium		
	16	285	SE	5.5	Medium – proximity to Site, infrequently downwind	High – dust annoyance to residents	Medium		
	17	430	S	1.9	Low – distance from Site, occasionally downwind	Low – transient dust nuisance	Low		
	18	340	W	1.8	Low – distance from Site, occasionally downwind	High – dust annoyance to residents	Medium		
	19	<10-500	Surrounding Site	1.8-15.7	High – close proximity to Site, frequently downwind	Medium – transient dust nuisance	Medium		
	20	25	SW	7.8	High – close proximity to Site, frequently downwind	Medium – potential deposition on sensitive vegetation	Medium		
	21	NE	460	12.7	Medium – proximity to Site, frequently downwind	Medium – potential deposition on sensitive vegetation	Medium		

Hazard / Pathway	Receptor				Probability of Exposure	Unmitigated Consequence	Unmitigated Risk	Risk Management	Mitigated Risk
	No.	Dist* (m)	Direc[n]	Freq** (%)					
	22	NE	580	12.7	Medium – proximity to Site, frequently downwind	Medium – dust annoyance to residents and staff	Medium	exposed to wind blow. Imported materials to be placed directly within the quarry void. Where stockpiling is deemed necessary, this will occur within the lower depth profile of the quarry void.	
	23	S	590	1.9	Low – distance from Site, occasionally downwind	Low – transient dust nuisance	Low		
	24	NW	640	8.8	Medium – proximity to Site, infrequently downwind	Medium – potential deposition on sensitive vegetation	Medium		
	25	E	780	7.4	Medium – proximity to Site, infrequently downwind	Medium – dust annoyance to residents	Medium		
	26	SW	860	7.8	Medium – proximity to Site, infrequently downwind	Medium – potential deposition on sensitive vegetation	Medium		
	27	NNE	860	10.7	Medium – proximity to Site, frequently downwind	Medium – dust annoyance to residents and staff	Medium		
	28	E	900	7.4	Medium – proximity to Site, infrequently downwind	Low – potential accumulation in watercourse	Low		
	29	N	270-1000	7.3	Medium – proximity to Site, infrequently downwind	Low - potential hazardous road conditions	Low		

[7] Community Engagement, Reporting and Contingencies

[7.1] 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 dust management system will ultimately be judged by the impact of the recovery for deposit activity 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). Checks will be undertaken as required and at least daily.

[7.2] Monitoring

[7.2.1] Off-Site Dust

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 facility itself.

A dust assessment will be completed for each inspection (Appendix A) during the site walkover checks and all site personnel will be responsible for reporting dust problems as soon as practicable to the Site Manager or the assigned deputy/supervisor. As described within the Site's EMS Summary, an environmental occurrence/non-conformance reporting system has been implemented by Tarmac to enable the efficient documentation, investigation and mitigation to occur and initiate corrective and further preventative actions.

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 (continuous during deposition); and
- Subject to prevailing wind direction (i.e. up and down wind), appropriate areas of the site perimeter.

During adverse conditions, as deemed appropriate by the competent site operatives / site management, an additional watching brief will be considered at nominated locations as required for visual observation monitoring purposes. This may involve deployment of staff at more than one location at the discretion of the site manager.

In the event that dust is reported to be excessive and / or dust is observed leaving the site boundary the site manager will be contacted (if not directly involved in the observations) and operations will be temporarily halted. Alternative options will be considered and if emissions are excessive, operations will be temporarily halted.

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

- Name of assessor and position at facility e.g. weighbridge clerk etc.;
- Nature of any problem identified including location, source, date, time, duration, prevailing weather conditions and likely cause;
- On-site activities and operational condition at the time of the monitoring visit (this should include any of the abnormal events detailed in Section 7.8 below);
- Records of the likely source of any dust, even if it is not from the facility;
- Details on the corrective action taken, realistic timeframes for remedial works and any subsequent changes to monitoring and operational procedures.
- In the event of adverse conditions, information is to be recorded on the Daily Dust Monitoring Check Sheet (Appendix A).

The Site Manager will be informed immediately of any findings of dust attributed to the Site and will authorise remedial measures to be taken. More frequent monitoring will be considered by site staff when the infilling reaches “higher levels” i.e. approaching ground level.

The operator will ensure appropriate controls are in place during extreme weather conditions to prevent dust or particulates spreading beyond the site boundary, including restricting or suspending activities most likely to generate dust and particulates. Additionally, the operator will ensure stockpiles are minimised in size, appropriately contained/sealed and dampened down to reduce windblown dust as necessary.

[7.2.2] PM_{10} Monitoring

Consideration has been given to the possible requirement for PM_{10} monitoring at the site. The activities on site depositing inert waste into the quarry void will be unlikely to produce significant volumes of dust and there will be limited activities associated with this activity that will involve further agitation of the waste. The site is not located within a PM_{10} Air Quality Management Area (AQMA)[7] and therefore monitoring for PM_{10} is not required.

[7.3] Complaints Process

Any complaints received at the facility or via the Regulatory Bodies including the Environment Agency and Local Authority, will be recorded using the form provided in Appendix B. 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 processes. 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 within the Site management system 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 and updated on the progress of the complaint investigation. All responses will be through trained and experienced staff.

[7] Vibrock (May 2018) Air Quality Assessment for a Proposed Eastern Extension at Wivenhoe Quarry, Essex

An initial investigation of the complaint will be conducted to clarify the source of the dust. In the event that a substantiated dust complaint is received arising from the facility, 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 facility 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;
- 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 facility;
- Details on the corrective action taken and any subsequent changes to monitoring and operational procedures; and,
- The Environment 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 Environment 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.

If repeated substantiated complaints are received, operations will temporarily cease while the issue is investigated so it can be corrected.

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.

[7.4] Means of Contact

The facility 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 Environment Agency. The company website will also contain the necessary contact details for the Site.

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

Operations do not occur “out of hours”, as such no out-of-hours arrangements are necessary. However, the site notice board does include an emergency number for out of hours if needed.

Contact details are made clearly visible on the site notice board, located at the site entrance.

If deemed necessary, a community liaison group will be established for the purpose of

providing a means of communication between local residents and Tarmac.

[7.5] Complaints Investigation

In the event that dust is found to be causing a nuisance and originating from Wivenhoe Quarry East, 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 course of action shall be undertaken:

- Additional dust monitoring to identify the extent of the dust emission and potential cause of 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.

All complaints whether they be made directly to Site or through a regulatory body, will be investigated.

[7.6] Contingency and Emergency Plans

Control and mitigation measures for each stage of the deposit for recovery process are summarised in Table 4.

[7.7] Abnormal Events

This Dust Management Plan assumes that the facility 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.

[7.7.1] Strong Winds

Visual inspection of the site infrastructure will be undertaken and recorded as required and at least daily. Additional inspection of damage resulting from high wind events will also be undertaken and contingency actions identified in this Management Plan will be considered should high wind conditions result in escape of significant dust emissions.

[7.7.2] Hot/Dry Conditions

During periods of warm weather, the potential for wastes to become dry and dusty increases, particularly when stored outside and when agitated. Inspections will be undertaken as required and at least daily of the waste to ensure waste delivered to the site is not dusty. If waste is determined to be dusty, additional wetting down of the material will occur if required, to reduce dust emissions. Water resources are considered appropriate, including site dewatering fluids, mains water and lagoon supply.

During prolonged periods of hot weather inspection frequency will be increased and the

surface area of stored waste will be kept to a minimum.

[7.7.3] Implementation of the Contingency Plan and/or Emergency Plan

No waste processing is envisioned.

Unavailability of machinery or vehicles will only take place due to unscheduled maintenance, emergency situations or for Health and Safety reasons for example, during a fire at the Site. In such cases the site staff will initially inform the Site Manager who will in turn inform Area Operations Manager, the Local Authority and the Environment Agency. Site staff will implement measures to store or divert wastes as required.

All site contingency and emergency plans are regularly reviewed and will be reviewed immediately following an incident. Training of the updated procedures and lessons learnt will be provided for site staff.

[7.8] 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;
- Date, time, duration, prevailing weather conditions and cause of dust emissions;
- Complaints received including name and address of the complainant; and
- Details of the corrective action taken, and any subsequent changes to operational procedures.

This DMP 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).

[7.9] Communication Tools

Stakeholders will typically include the Local Authority, the Environment Agency, Parish Councils and members of the local community. Other stakeholders may include local businesses and/or residents potentially impacted by the Site activities.

Additionally, 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 Daily Dust Monitoring Check Sheet

Dust Monitoring Check Sheet	
Check carried out by	
Position	
Date & Time investigation carried out	
Weather conditions	
Approximate Wind direction	
Observations	
Review and Actions if Required	
Improvements needed to prevent a reoccurrence or specific mitigation instigated	
Closure	
Site Manager review date	
Site Manager signature to confirm no further action required	

Appendix B Example Dust Complaint Reporting Form

APPENDIX 3

Example Dust Complaint Reporting Form

Dust complaint report form	**Date:**
Name and address of complainant:	
Tel no. of complainant:	
Date and time of complaint:	
Complainants description:	
Any other relevant information:	
Dust sources operating at time of complaint:	
Operating conditions at the time of complaint:	
Weather conditions at the time of complaint:	
Action taken:	
Final Outcome:	

From completed by:		**Signed:**	

Drawings

Elmstead Heath

Proposed Site Access

B1027

Tye Lane

Keelars Tye

Keelars Farm

Pond

Birds Farm

School Road

Englishes Farm

Rosedene

Mitchels Farm Shop

162/24

BUND A

BUND B

BUND C

BUND D

BUND E

BUND F

BUND G

BUND H

BUND I

FRESHWATER LAGOON

LAGOON 1

LAGOON 2

LAGOON 3

LAGOON 4

PROPOSED LOCATION OF TUNNEL UNDER FP24

Phase 1 and Plant Site

Phase 2

Phase 3

Phase 4

Phase 5

Phase 6

Phase 7

FOOTPATH 162/24 RETAINED THROUGHOUT AND SECURED WITH FENCING AS APPROPRIATE

30m STAND OFF TO COCKAYNES WOOD

Cockaynes Wood

Villa Wood

Ponds

Pump House

Sixpenny Brook

Piggery

Furzedown

Sunnymead Farm

Beulah

The Fieldings

Blackboard Cottage

Boarded Cottage

Lee Oak

The Orchards

Near Dun

Wilwyn

Europa

Woodstock

Oakwood Cottage

Primrose Cottage

Heath Lodge

Vine Cottage

Woodlands

Kimbar Gardens

St Christophers

Heath Farm

Broadview Cottages

Willow Lodge

White Lodge

Cockaynes Lane

157/20

157/2

162/19

162/16

Path (um)

Legend

- Boundary: Application Site
- Boundary: Proposed Extraction Area
- Phase 1 — Proposed Phasing
- Proposed Direction of Working
- 27 — Existing Ground Surface Contour at 0.5m interval
- Existing Vegetation
- 157/2 — Existing Public Right of Way and Reference
- Permissive Footpath
- Proposed Soil Stores
- Proposed Silt Lagoons
- Root Protection Area and Tree Reference

TARMAC
A CRH COMPANY

Site Name: W328 - Wivenhoe

Drawing Name: Proposed Working Plan

Drawn By:	Scale @ A1:
DJA	1:2,000
Date:	**Drawing Number:**
21/08/2019	W328-00062-03-D

DAVID JARVIS ASSOCIATES