

CONTENTS

Introduction	7-1
Scope	7-1
Overview of Previous Site Operations	7-1
Overview of Proposed Operations	7-2
Guidance and Industry Good Practice	7-2
National Legislation and Guidance	7-2
Planning Policy	7-3
General Nuisance Legislation	7-5
Design Manual for Roads and Bridges	7-5
Further Research / Guidance	7-5
Assessment methodology	7-6
Dust Assessment	7-6
Vehicular Pollutants	7-6
Baseline Environment	7-7
Location	7-7
Meteorology	7-7
Sensitive Receptors	7-9
Baseline Air Quality	7-10
Assessment of Effects and Significance	7-11
Dust	7-11
Sources of Dust	7-12
Dust Impact Assessment	7-15
Mitigation Measures	7-18
Residual Impacts	7-20
Conclusions	7-20

INTRODUCTION

- 7.1 This chapter of the ES considers the potential air quality impacts as a result of the proposed changes at Warren Heath Recycling Facility, Warren Heath, Welsh Drive, Bramshill. R. Collard are applying to retain the secondary aggregate recycling facility for a permanent period of time to handle a maximum of 250,000tpa and to construct a screening bund at the eastern and southern perimeters of the site.
- 7.2 This air quality assessment looks at the impacts associated with the increased tonnage and extension of time at the site as well as the impacts of the construction of the bund. The primary impacts from an air quality perspective in relation to the application site relate to the release of dust and traffic exhaust emissions. Any change in the local air quality as a result of the application site has been assessed against the baseline scenario.

Scope

- 7.3 In pre-application consultations with Hampshire County Council (HCC) 'amenity issues' were identified as requiring assessment. This assessment has been undertaken to address these issues by assessing dust and vehicle emissions.
- 7.4 The baseline scenario, against which any additional dust impacts would be assessed, includes the existing site for which temporary permission exists for the recycling of aggregate waste.
- 7.5 The following aspects of the assessment were agreed with the Environmental Health Department¹:
- the primary impact requiring assessment are the potential emissions of dust and traffic emissions;
 - a qualitative assessment of risk for deposited dust impacts shall be undertaken using local meteorological conditions (wind speed, direction and rainfall patterns) on local receptors;
 - mitigation measures shall be proposed; and
 - screening assessment for traffic emissions and a DMRB assessment if required.

Overview of Previous Site Operations

- 7.6 The existing operation is located in a previously extracted gravel pit which is lower than the surrounding land. It is currently operating under a temporary permission 00/00/349/CMA and 00/00679/CMA for inert construction, demolition and excavation waste and secondary aggregate recycling facility, which expires on the 31st December 2013.
- 7.7 The existing permission allows for the receipt of 50,000tpa of waste for the

¹ Email communication with Neil Hince, Principal Environmental Health Officer, Hart District Council. 20th December 2012.

crushing, screening and storage of inert construction and demolition wastes. The site has 3 temporary buildings which would be retained.

- 7.8 Waste is delivered to the application site by heavy duty vehicles (HDVs) for which the maximum permitted number of vehicle movements is 42 movements per day (21 trips), between the operational hours of 07:30 and 16:00 hours Monday to Friday and 07:30 to 13:00 on Saturday.

Overview of Proposed Operations

- 7.9 Proposed site operations would be similar in nature to previous permitted operations but would involve the permanent retention of the secondary aggregate recycling facility. It is also proposed that the permitted tonnage is increased to handle a maximum of 250,000tpa which would result in the installation of new processing plant including a new multi deck dry screening and/or aggregate washing systems.
- 7.10 Despite the increase in tonnage it is considered the operating hours will remain the same. There are expected to be 136 HDV movements per day with each expected to carry 20 tonne payloads, representing an increase of 94 movements over the extant consented use for the site.
- 7.11 Construction of a screening bund at the perimeter of the site to the south and east proposed as part of this application. This will border the A327 to the east and Sir Richards Ride to the South. Construction of the bund is expected to take approximately 18-months. During this time existing operations will continue. Once the bund is completed the site will operate at the increased tonnage.

GUIDANCE AND INDUSTRY GOOD PRACTICE

National Legislation and Guidance

Air Quality Strategy

- 7.12 The 'Air Quality Strategy for England, Scotland, Wales and Northern Ireland' (AQS) 2007, contains air quality objectives based on the protection of both human health and vegetation (ecosystems). The Air Quality Strategy sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met.
- 7.13 These objectives have been set taking into account the Air Quality Standards defined in the Air Quality Standards Regulations 2010. The AQS objectives relevant to this assessment, relate to particulate matter and are shown in Table 7-1 below.

Table 7-1 : Air Quality Strategy Objectives

Pollutant	Concentration	Measured as	Reference
Particulate matter (PM ₁₀) (gravimetric)	50 µg/m ³	24-hour mean not to be exceeded more than 35 times per year (90.4 %ile)	AQS
	40 µg/m ³	Annual mean	

Local Air Quality Management (LAQM)

- 7.14 Part IV of the Environment Act 1995 requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider the present and future air quality and whether any air quality objectives prescribed in regulations are being achieved or are likely to be achieved in the future.
- 7.15 Where any of the prescribed air quality Objectives are not likely to be achieved the authority concerned must designate an Air Quality Management Area (AQMA). For each AQMA the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the air quality Objectives.
- 7.16 Defra has published technical guidance for use by local authorities in their review and assessment work².

Planning Policy

National Policy

- 7.17 The National Planning Policy Framework (NPPF) describes the policy context in relation to pollutants including air pollutants:

‘The Government’s objective is that planning should help to deliver a healthy natural environment for the benefit of everyone and safe places which promote wellbeing.

To achieve this objective, the planning system should contribute and enhance the natural and local environment by:

[...] preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of land, air, water or noise pollution or land instability.’

- 7.18 Specifically in terms of development with regard to air quality:

‘Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.

² Department for Environment, Food and Rural Affairs (DEFRA): Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(09), 2009.

- 7.19 The policy contained within the NPPF relating to air quality is addressed within this assessment.

Local Policy

Harts District Council

- 7.20 HDC has completed its Local Core Strategy which provides a long term strategy for planning within the district. This Core Strategy is currently out to consultation until January 2013 and may therefore be subject to change. The council have saved some other policies which will be used in conjunction with this new strategy.
- 7.21 One saved policy GEN1 states *'proposals for development which accord with other proposals of this plan will be permitted where they: avoid any material loss of amenity to existing and adjoining residential, commercial, recreational, agricultural or forestry uses, by virtue of noise, disturbance, noxious fumes, dust, pollution or traffic generation'*.
- 7.22 Saved policy GEN8 goes on to say: *'Proposals for development which could significantly adversely affect the quality of air, surface water or ground water, will not be permitted.'*
- 7.23 The Core Strategy states in a number of locations that the impact of development on ecological sites needs to be mitigated. Policy CS18: Thames Basin Heaths Special Protection Area (SPA) specifically relates to air quality in term of its impact on Thames basin Heaths:

'Where development that is likely to have a significant effect on the SPA is proposed it will be required to demonstrate that adequate measures are to be put in place to avoid or mitigate any potential adverse effects.'

To ensure that the effects of air pollution on the SPA are considered the Council will work with other local authorities, land managers and strategic highway authorities to develop a framework by which measures to improve air quality can be linked to the monitoring of air quality in the SPA before and for a number of years after introduction of these measures. Further measures could then be introduced if the air quality does not improve. In making these assessments, the critical load for the relevant habitat should be used as the target for assessment. While not mitigation in itself, such monitoring is an essential factor when dealing with an issue such as air quality which has a high degree of uncertainty, since it will enable the effectiveness of air quality improvement measures to be evaluated and amended over the plan period.'

Hampshire County Council

- 7.24 HCC has adopted their Minerals and Waste Core Strategy Development Plan Document 2007. Within this plan, policy DC8 - Pollution, Health, Quality of Life and Amenity, relates to the development at the application site. This states;

'Minerals and waste development will only be permitted if due regard is given

to the pollution and amenity impacts on the residents and users of the locality and there is unlikely to be an unacceptable impact on health and/or the quality of life of occupants of nearby dwellings and other sensitive properties.'

7.25 This assessment has been undertaken to address these policies.

General Nuisance Legislation

7.26 Part III of the Environmental Protection Act (EPA) 1990 (as amended by the Noise and Statutory Nuisance Act 1993) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance. It also defines accumulation or deposit, which is prejudicial to health as a nuisance.

7.27 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.

Design Manual for Roads and Bridges

7.28 The "Design Manual for Roads and Bridges" (DMRB)³ was introduced in 1992 in England and Wales, and subsequently in Scotland and Northern Ireland. It provides a comprehensive manual system which accommodates current Standards, advice notes and other published documents relating to trunk road works. In the UK, particularly in relation to air quality, the DMRB guidance is commonly applied to all potential schemes involving changes to traffic flows and also in LAQM Updating and Screening Assessments.

Further Research / Guidance

Monitoring of particulate matter in ambient air around waste facilities: Technical Guidance M17

7.29 The Environment Agency has published a technical guidance document M17⁴ which relates to dust assessment around waste facilities. M17 provides information of the monitoring methods and techniques available for assessing levels of particulate matter in ambient air around waste facilities.

Planning for Waste Management Facilities

7.30 A research study⁵, undertaken by the Office of the Deputy Prime Minister

³ Highways Agency (2007) Design manual for roads and bridges. Version 207/07.

⁴ Environment Agency (2004) *Monitoring of particulate matter in ambient air around waste facilities*. Technical Guidance Document (Monitoring) M17

⁵ Office of the Deputy Prime Minister (2004). *Planning for Waste Management Facilities*. A Research Facility

details general planning considerations for waste management facilities. This also details specific issues for a variety of waste sites types, using case examples.

Institute of Air Quality Management Construction Dust Guidance

- 7.31 Guidance on the assessment of the impacts of construction on air quality and the determination of their significance has been prepared by the Institute of Air Quality Management (IAQM)⁶. This evaluates the risk of site activities and determines the significance of impacts once mitigation measures have been employed. The IAQM have also produced Dust and Mitigation Measure Guidance⁷ complementing their significance guidance by describing measures in accordance with assessed risk.

ASSESSMENT METHODOLOGY

Dust Assessment

- 7.32 This assessment examines the additional sources of dust associated with the change in operations. The assessment takes into account the prevailing meteorological conditions at the site; particularly the frequency of wind speeds capable of carrying airborne dust (greater than 3m/s)⁸ and the frequency of rainfall considered sufficient to effectively suppress wind-blown dust emissions (greater than 0.2 mm/day⁹) in assessing dust nuisance impacts.
- 7.33 Fugitive releases of dust have been assessed using a qualitative approach by consideration of the following:
- the nature, scale and duration of activities undertaken on site in order to determine the potential magnitude of releases;
 - the land uses and location of receptors in the surrounding area;
 - the local climate and meteorology; and
 - existing dust control measures and their effectiveness.
- 7.34 Subsequently, recommendations for any further mitigation measures on site have been made and the residual impacts following the implementation of such measures re-assessed.

Vehicular Pollutants Assessment

- 7.35 Vehicular emissions related to waste transfer stations are primarily associated with the exhaust emissions from HDVs. The decision as to

⁶ Institute of Air Quality Management (IAQM), Guidance on the assessment of the impacts of construction on air quality and the determination of their significance, 2012.

⁷ Institute of Air Quality Management (IAQM). Dust and Air Emissions Mitigation Measures, April 2012.

⁸ K. W. Nicholson (1988) A review of particle re-suspension. Atmospheric Environment Volume 22, Issue 12, 1988, Pages 2639-2651

⁹ Leeds University. Good Quarry. Available at: <http://www.goodquarry.com/>

whether an assessment of potential impact is required is based upon the criteria set out in the DMRB.

- 7.36 The criterion for assessment of air quality contained within the latest DMRB (207/07)³ focuses on roads with relatively high flows of HDV traffic. 'Affected roads' are those that meet any of the following criteria:
- road alignment will change by 5 m or more; or
 - daily traffic flows will change by 1,000 AADT or more; or
 - Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
 - daily average speed will change by 10 km/hr or more; or
 - peak hour speed will change by 20 km/hr or more.
- 7.37 The DMRB considers any receptor within 200m of an 'affected road' by that operation. Receptors, including ecological designations within 200m of a road source require further assessment of potential impacts.
- 7.38 If none of the roads in the network meet any of the traffic/alignment criteria or there are no properties or relevant Designated Sites near the affected roads, then the impact of the scheme can be considered to be neutral in terms of local air quality and no further air quality assessment is required.
- 7.39 The existing maximum permitted number of HDV movements is 42 per day however the actual existing movements are approximately 28 per day. During the construction of the bund the number of movements is expected to be 82 per day which will include the back haulage of some material. Once bund construction is complete the operation of the site at the increased tonnages is expected to be a maximum of 136 movements per day.
- 7.40 Therefore none of the roads are 'affected roads' as none meet the screening criteria; particularly in terms of HDV's movements. Therefore the impact of the scheme can be considered to be neutral in terms of traffic emissions and therefore no further assessment is required.

BASELINE ENVIRONMENT

Location

- 7.41 The site is located in a semi-rural area between the towns of Yateley and Hartfordbridge. The application site is located within an area which has previously been subject to mineral extraction and restoration with an active quarry located to the north of the site. To the south and west the site is bordered by woodland, and to the east the A327, beyond which is Castle Bottom to Yateley and Hawley Commons (SSSI). There are a number of isolated properties located within 1km of the site of which Harewood House and Hawkers Lodge are the closest.

Meteorology

- 7.42 The generation, release and dispersion of fugitive dust are particularly dependent upon weather conditions and the nature of the handled material.

The prevailing meteorological conditions at any site would be dependent upon many factors including its location in relation to macroclimatic conditions as well as more site specific, microclimatic conditions. The most important climatic parameters governing the emission and magnitude of impact of dust are:

- wind direction which determines the broad transport of the emission and the direction in which it is dispersed; and
- wind speed will affect ground level emissions by increasing the initial dilution of pollutants in the emission; it will also affect the potential for dust entrainment.

7.43 Rainfall is also an important climatological parameter in the generation of dust; sufficient amounts of rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)¹⁰ rainfall greater than 0.2mm per day is sufficient to suppress dust emissions.

Wind Speed and Direction Data

7.44 A meteorological station considered representative of local site conditions with available data is located at Odiham, approximately 10km south of the site. A 5 year data set for this station has been used for this purpose. A windrose for the Odiham observing station is presented in Figure 7-1.

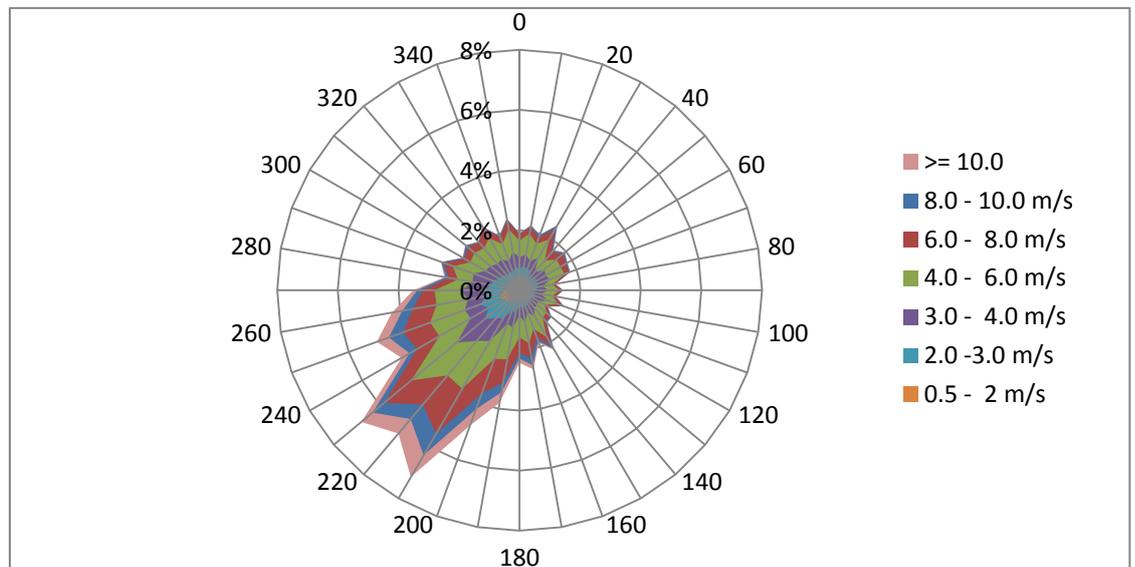


Figure 7-1: Windrose for Odiham Observation Station

7.45 From Figure 7-1 it can be seen that the majority of winds are from the southwest with winds from this sector occurring for approximately 45% of the year. On this basis, it is locations from northern to eastern sectors which have the highest potential for impacts from any dust emissions originating from the site.

¹⁰ Arup & Ove Arup Environmental. Environment Effects of Surface Mineral Workings. DoE, October 1995

Rainfall

7.46 Average rainfall data has been obtained for the Wisley meteorological observation station, located approximately 28km east of the site. Average data records (1971 to 2000) indicate that the average number of rainfall days per year (days with rainfall >1mm) is 110.2, which relates to 30% of the year.

Sensitive Receptors

Human Receptors

7.47 Sensitive receptor locations are those where the public may be exposed to dust potentially arising from the site. The most sensitive receptor locations are residential dwellings where people generally expect a high level of amenity. The location of these sensitive receptors are summarised below in Table and displayed in Drawing AQ1.

Table 7-2: Discrete Receptor Locations

	Receptor	Sensitivity to Dust ¹¹	OS X	OS Y	Distance from site boundary (m)	Direction from nearest site boundary (°)
R1	Busta Farm	Medium	478480	160064	416	000
R2	Saw Mill Caravan Site	Medium	478360	158630	520	190
R3	Westfield Farm	Medium	479149	160015	770	050
R4	Hill House	Medium	478900	159770	390	065
R5	Blackbush Airport	Low	479505	158855	852	110
R6	Bramshill Park	Medium	476110	159785	2,300	270
R7	Quarry Building	Low	479397	159305	770	100
R8	Hawkers Lodge	Medium	478717	159100	23	148
R9	Harewood House	Medium	478439	159667	20	000

7.48 Located to the north of the site is Welsh Drive bridleway and to the south Sir Richards Ride track as well as footpath No. 27 located 200m to the north east of the site. Due to the short term exposure along these footpaths they are not considered to be sensitive to dust.

Ecological Receptors

7.49 There are a number of ecological receptors within 2km of the site. Many of these are located adjacent to the site within the forested areas surrounding the site.

Table 7-3: Ecological Receptors within 2km

Site	Designation	Distance from	Direction
------	-------------	---------------	-----------

¹¹ Communities and Government. Technical Guidance to the National Planning Policy Framework. March 2012.

		Site (m)	from Site (°)
Thames Basin Heaths	SPA	Adjacent	Encompassing
Castle Bottom To Yateley And Hawley Commons	SSSI/NNR	40m	000-160
Bramshill	SSSI	Adjacent	180-000
Hulfords Copse	Ancient Woodlands	1400m	240
Coombes Wood	Ancient Woodlands	330m	300-350
Great/Alder Copses	Ancient Woodlands	809m	000
Lower Eversley Copse	Ancient Woodlands	1,300m	25
Chalwins Copse	Ancient Woodlands	2000m	260

- 7.50 Castle Bottom SSSI is designated for its heathland and young conifer plantation which supports an internationally important population of Dartford warbler, woodlark and nightjar.
- 7.51 Bramshill SSSI is designated due to the shallow acid ponds and associated mire, which support a rich assemblage of dragonfly and damselfly and nightjar, woodlark and Dartford warbler. Both of these are components of the Thames Basin Heaths SPA.

Baseline Air Quality

Local Authority Review and Assessment

- 7.52 The Application site lies within the administrative area of HDC. The most recent air quality report available is the Updating and Screening Assessment 2012. This has indicated that there are no AQMAs declared by HDC within the Council's area.
- 7.53 Particulate matter monitoring is undertaken in Blackwater at a kerbside location by an automatic monitor using a TEOM Analyser. The results are displayed in Table 7-4 below. This shows that annual mean PM₁₀ is 'well below' the AQO, in accordance with Environmental Protection UK Guidance¹².

Table 7-4: PM₁₀ Results

	Concentration µg/m ³ (No of 24-hour Mean Exceedances)				
	2007	2008	2009	2010	2011
Blackwater	18.9 (2)	21.5 (9)	19.3 (3)	20.3 (4)	21.3 (11)

- 7.54 The Updating and Screening assessment identifies sand and gravel extraction at a quarry in the vicinity of Coopers Hill (the area encompassing the application site) and the Hartford Bridge Flats as a source of fugitive dust. Based on the background PM₁₀ concentrations and distance to properties it was concluded '*a Detailed Assessment is not required in this case*'.

¹² Environmental Protection UK. Development Control: Planning For Air Quality (2010 Update)

Defra Background Maps

- 7.55 Background pollutant concentration data on a 1km x 1km spatial resolution is provided by Defra and is routinely used to support LAQM and Air Quality Assessments.
- 7.56 Mapped background concentrations for PM₁₀ were downloaded for grid square x478500, y159500 which contains the Application Site, from the 2010 based background maps (updated August 2012). These are presented in Table 7-5 below. The concentration is 'well below'²⁰ the annual mean limit value of 40µg/m³.

Table 7-5: Estimated Annual Mean Background Concentrations 2013

Pollutant	PM ₁₀ (µg/m ³)
Total	16.0

Complaints

- 7.57 The site has been operating under a temporary permission and during this period there have been no complaints according to the Applicant who keep a written record.

ASSESSMENT OF EFFECTS AND SIGNIFICANCE

- 7.58 This chapter presents the potential sources and dust impacts associated with the expansion of operations and the construction of the screening bund.

Dust

- 7.59 The increase in tonnage throughput has the potential to generate additional dust above the baseline level generated by existing operations. The permanent retention of the facility will not itself cause an increase in the generation of dust but will result in a permanent potential source of dust.
- 7.60 The vast majority of particles responsible for annoyance are deposited within 100m – 200m of the source¹³, and hence it is in this zone that the risk of problems from dust is greatest. Research¹⁴ indicates that coarse dusts (for example greater than 30µm in diameter) will largely deposit within 100m of the source.
- 7.61 For all sources, the creation and subsequent dispersion of dust will be highly dependent on the weather conditions. Wind speed can determine the amount of dust raised, while wind direction determines those areas that may be affected. Higher wind speed increases the potential for the generation of airborne dust due to the suspension and entrainment of particles in airflow; rainfall however, has a suppressive effect on the generation of dust.

¹³ MPS2, Annex 1: Controlling and Mitigating the Environmental Effects of Mineral Extraction in England.

¹⁴ Minerals Policy Statement 2: *Controlling and Mitigating the Environmental Effects of Minerals Extraction in England*. Annex 1: Dust. Appendix 1A, paragraph 1A.5.

Sources of Dust

- 7.62 The primary sources of dust, according to M17¹⁵, from inert waste transfer stations, for which operations on the application site are similar, are from '*...activities associated with tipping, crushing, shaking and screening of waste*'. Other potential sources of dust are from roads and surfaces across the waste facility.
- 7.63 Existing operations at the application site involve the storage, crushing and screening of waste for recovery by manufacturing of aggregate and soils. Initially these operations will continue during the construction of the bund. Once the bund is complete the operational phase will continue at a greater throughput of material of approximately 250,000tpa. Therefore there is considered to be a larger area of dust sources. These potential sources have been assessed and the principal activities that would give rise to potential for dust emissions from the development have been identified as:
- Operational phase
 - stockpiling of material;
 - crushing and screening;
 - material handling; and
 - vehicle movements
 - Bund construction
 - material handling;
 - stockpiling; and
 - vehicle movements
- 7.64 The amount of dust generated by each activity depends on the size of particles and, crucially, upon their moisture content. Material received on site during the operation will mainly include blocks of concrete and brick of large particle size, while during bund construction soils will also be imported which have smaller particles and therefore dust emissions could be greater.

Operational Phase

Storage

- 7.65 Material is transported to site by HDV for recycling. The vehicles enter the site via the weighbridge and deposit material into a large stockpile for screening and crushing. There are a number of stockpiles with screened soil aggregate or concrete of processed and unprocessed material.
- 7.66 The waste types to be accepted will generally be large blocks of concrete and brick and therefore these stockpiles will have a low potential to generate dust. Those stockpiles which have been processed such as soil stockpiles will have a higher potential for dust generation through wind entrainment due to the smaller particle size.
- 7.67 The period of product stockpiling is considered to be relatively short, with

¹⁵ Environment Agency 2004. Monitoring of Particulate Matter in Ambient Air around Waste Facilities (M17).

material continuously being removed from the stockpile to be transported off-site. Due to the nature of operations, stockpiles would usually be left uncovered due to the need for frequent material transfer into or out of the stockpile.

- 7.68 Due to the proposed increase in tonnage there is potential for a greater volume of material to be stored and therefore a greater surface area for potential dust generation.
- 7.69 Without any mitigation measures, in comparison to existing baseline operations, there is likely to be a small increase in potential for dust generation from the storage areas with the overall risk considered to be moderate.

Processing

- 7.70 As with currently permitted operations, the loading and unloading of material into the processing plant is a source of potential dust generation.
- 7.71 The processing of waste will be similar to existing operations in which incoming waste material will be fed by a 360° excavator into the crusher and/or screener to produce secondary aggregates or soil. The action of crushing and screening the material, disaggregating the particles, could generate dust.
- 7.72 The wash plant is anticipated to be located within the centre of the site which would have a very low dust risk associated with its activities. The existing processing plant comprises x2 Crushers and x2 screeners.
- 7.73 Processed material will be discharged from the wash plant into small stockpiles which are then re-handled to larger storage stockpiles. Material will be transferred between stockpiles using a wheeled loader which is also used to ultimately load the material into HDVs to transport material offsite.
- 7.74 The processing of the material is anticipated to result in a small increase in the potential for dust generation above the baseline as the oversize from the washing will provide more feedstock for crushing.

Material Handling

- 7.75 Loading and unloading of storage piles and processing plant has the potential for generation of dust but strongly depends on the timing of operations with respect to meteorological conditions and the characteristics of the material being handled. Operations carried out during periods of dry and/or windy weather are more likely to result in wind-entrained dust capable of carrying the dust beyond the site boundary. During loading onto storage piles either from processing plant or excavator, fine dust is easily disaggregated and released to the atmosphere on exposure to surface winds.
- 7.76 The handling and transfer of material without any mitigation measures has the potential for a small increase in the generation of dust as a result of the tonnage increase, especially when exposed to surface wind.

Vehicle Movements

- 7.77 Vehicles will enter the facility via the A327 and report to the site control office. The access road is tarmacked with the surface of the site processing area comprising concrete hard standing.
- 7.78 Particulate emissions from road surfaces are primarily due to re-suspension of loose material present on the road surface and the additional deposition of material from the under carriage of passing vehicles.
- 7.79 The main factor in the production of dust emissions from paved road surfaces is the re-suspension of loose material on the surface deposited by vehicles through spillages, or trackout¹⁶. The material can become entrained by wind blow, with the dust generation dependant on wind speed, rainfall and the size of dust particles.
- 7.80 It is proposed with increased tonnages HDV movements will be 136 per day.
- 7.81 Trackout from the site can extend up to 500m from the site entrance. In accordance with guidance¹⁷ this would result in a 'medium' risk dust class during the operational phase. Taking this into account with receptors just over 20m from the haul roads the site is considered to be medium risk and therefore dust mitigation measures for trackout from a medium risk site in accordance with IAQM guidance¹⁸ should be employed. The potential risk of dust impacts associated with the increase in vehicle movements is expected to be 'medium'.

Bund Construction

- 7.82 The sources of dust during the construction of the bund will be similar to those during operation of the site. However, the risk of impact could potentially be larger due to the finer nature of the handled material.

Material Handling

- 7.83 The most significant source of dust is likely to be from the handling of soil used to construct the bund. Therefore, like the operational phase, the potential for dust strongly depends on the timing in respect to meteorological conditions. The construction of the bund will involve unloading of soils and the shaping and profiling of the slope. This is considered to be a medium risk of dust generation.

Storage

- 7.84 The actual bund itself could potentially be a source of dust, as winds could entrain dust from the surface of the storage mound. This greatly depends on the gradient of the slope, the moisture content of the material, the sizes of the particles and the profiling. Soils have inherently small particles and therefore the potential source of dust from the bund is expected to be medium.

¹⁶ USEPA 2011. AP42 Fifth Edition. Volume 1. Chapter 13. Miscellaneous Sources. Section 13.2.1

¹⁷ Institute of Air Quality Management. Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance. January 2012.

¹⁸ Institute of Air Quality Management. Dust and Air Emissions Mitigation Measures.

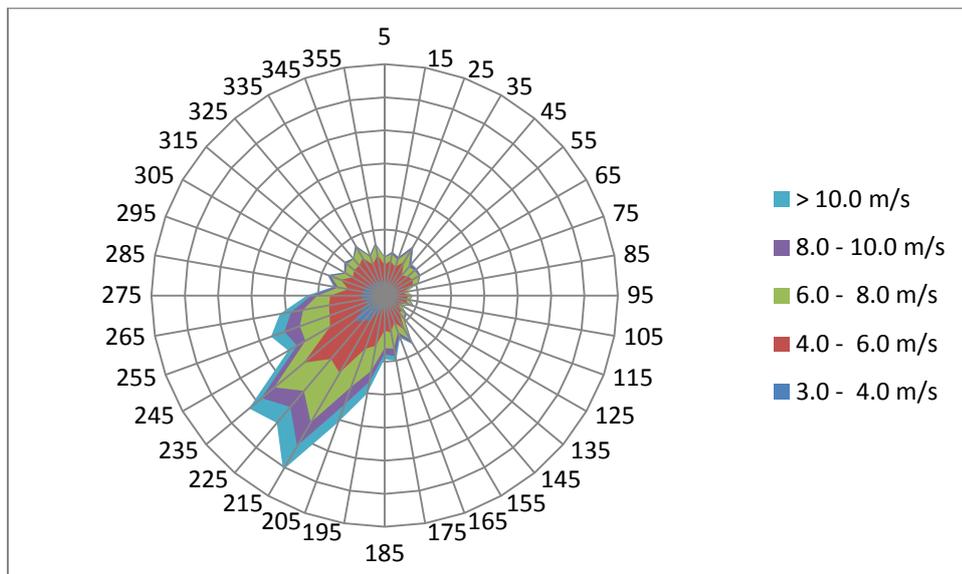
- 7.85 Initially, potential dust generated from the bund construction could be high, but as the bund begins to weather the dust generation will subside, so the long-term potential dust impact from the creation of the bund is considered to be very small and not significant.

Vehicle Movements

- 7.86 The sources of dust from the haul road during the construction of the bund is anticipated to be very similar to the operation of the site. The construction of the bund is expected to be undertaken over 18 months which would include 82 movements per day based on backhauling 50% of the material and 20 tonnes vehicles.
- 7.87 This number of movements would also result in a 'medium' risk dust class during the construction phase. Taking this into account with receptors just over 20m from the haul roads the site is considered to be medium risk and therefore dust mitigation measures for trackout from a medium risk site in accordance with IAQM guidance¹⁹ should be employed.

Dust Impact Assessment

- 7.88 An assessment of potential dust impacts on local receptors has been undertaken, based on the potential source of dust identified above the baseline. Although dust from such activities would be expected to deposit on the ground within 100-200m of the source, receptors within a distance of 500m have been assessed.
- 7.89 A windrose of winds capable of carrying airborne dust is presented in Figure 7-1 from the Odiham meteorological station.



¹⁹ Institute of Air Quality Management. Dust and Air Emissions Mitigation Measures.

Figure 7-2: Windrose from Odiham – Winds >3m/s

- 7.90 Figure 7-2 illustrates the prevailing wind direction for moderate to high winds (i.e above 3m/s) is from the south-west. Receptors located to the north-east of the site would therefore expect to be at a higher risk of experiencing dust impacts due to their location downwind of the site. The natural dust suppression however, provided by local rainfall patterns would expect to significantly reduce the risk, with sufficient rainfall to suppress dust emissions at the source falling on 30% of days of the year.

Human Receptors

- 7.91 The closest receptors to potential sources of dust from the site are those located to the north and south of the site. Hawkers Lodge and Harewood House are located 23m and 20m from the site respectively. Winds from the south/ south west >3m/s 175°-275° occur for approximately 60% of the time in the direction of the closest receptor. Harewood House is located within this prevailing wind direction from site and is therefore considered to be the receptor most at risk of dust impacts.
- 7.92 The source of dust with the highest potential for dust generation during the operational phase has been identified as dust from the haul road at a medium risk. The greatest impact at Harewood House is considered to be from the haul road as this is the closest source of dust. As the site is considered to be within an area of 'low' to 'medium' sensitivity as described within IAQM guidance, and with a 'medium risk site', the impact is considered to be 'negligible' during the operation of the site and construction of the bund. Despite this mitigation measures in accordance with a medium risk site for dust impacts from haul roads are detailed in section 7.106.
- 7.93 The increased risk of dust from other identified sources such as material handling, storage and processing, above the baseline of existing operations was assessed to be small, with the exception of material handling during the bund construction which was assessed to be medium. Considering the small to medium increase in dust generation, the identified risk from the haul and no complaints recorded, the risk of impact is considered to be negligible at all properties including Harewood House and Hawkers Lodge.
- 7.94 With regards to PM₁₀, the background PM₁₀ emissions described in Table 7-4 are 16µg/m³ and being 'well below' the AQO. The small increase in dust is not considered to increase PM₁₀ above the AQS limits and therefore without mitigation measures there is considered to be a negligible²⁰ impact on receptors.

Ecological Receptors

- 7.95 The effects of particulate matter have not been subject to extensive research and therefore little published guidance is available. A majority of the research undertaken has focussed on the chemical effects of alkaline dusts. A

²⁰ Environmental Protection UK. Development Control; Planning for Air Quality (2010 Update)

summary of a review of available research on behalf of the DETR²¹ concluded that:

'the issue of dust on ecological receptors is largely confined to the associated chemical effect of dust, and particularly the effect of acidic or alkaline dust influencing vegetation through soils.'

- 7.96 Significant quantities of highly alkaline or acidic dusts with a significant risk of becoming airborne could cause some risk of impact on nearby vegetation. The waste types to be received and processed at the mainly include inert construction and quarried material. Some concrete is received at the site, which as detailed within Farmer 1991 can be alkaline. However considering the risk of dust release and the distances to ecological receptors, the risk of the facility leading to significant chemical effects on the surrounding plants within the SSSI's/SPA is considered to be low.
- 7.97 With regard to current levels of dust deposition on the surrounding habitats, the site has historically been quarried for sand and gravel and has been operating temporarily for more than 10 years. The closest SSSI, particularly Castle Bottom to Yateley and Hawley Commons unit 11 and Bramshill SSSI unit 2 are adjacent to the site. The site condition reports for both SSSI's^{22,23} have been reviewed and neither report refer to any issues regarding detriment from dust. As a result it can be assumed that the present habitats are not highly sensitive to, or adversely affected by, the levels or chemical impacts of dust at the site.
- 7.98 An Interim Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, part 1 of the Design Manual for Roads and Bridges (and now incorporated into HA207/07²⁴) suggests that only dust deposition levels above 1,000 mg/m²/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. It states that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this²⁵.
- 7.99 By ensuring dust levels are kept to levels whereby perceptible nuisance to humans is not apparent (200mg/m²/day); levels of dust are expected to be significantly below the suggested level at which ecological receptors would be affected. Hawkers Lodge and Harewood House are similar distances to the site as the SSSI's and SAC. By ensuring that sources of dust are controlled using general practice mitigation measures there is considered to be a negligible impact on nearby ecological receptors.

²¹ Department of the Environment, Transport and the Regions (DETR) 1995: *The Environmental Effects of Dust from Surface Mineral Workings – Volume Two*.

²² <http://www.sssi.naturalengland.org.uk/special/sssi/reportAction.cfm?report=sdrt13&category=S&reference=1003946>

²³ <http://www.sssi.naturalengland.org.uk/special/sssi/reportAction.cfm?report=sdrt13&category=S&reference=1006836>

²⁴ Design Manual for Roads and Bridges. Volume 11, Section 3. Part 1 HA207/07. Annex F.

²⁵ Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSI's (Supplement to DMRB 11.3.1), Interim Advice Note 61/04, March 2005

7.100 The impact of traffic emissions on the ecological receptors was considered to be 'negligible' as described in section 7.40, based on the low development traffic quantum.

MITIGATION MEASURES

7.101 There are a number of dust mitigation measures currently employed at the site in relation to the temporary permission. These are reviewed in terms of their effectiveness of controlling dust emissions and further mitigation measures are recommended as and where necessary, due to the increase in tonnage. Separate mitigation measures are recommended particularly for the construction of the bund and additional measures to control dust trackout onto local roads.

7.102 The assessment of risk has considered there is a low risk of dust impacts at the nearest properties. The primary measures in the existing working scheme for controlling dust emissions as detailed within the sites Dust Management Plan²⁶ include:

- paved processing area and initial haul road section from public roads, facilitating cleaning;
- use of water sprays where required;
- sheeting of vehicles where necessary;
- use of mechanical sweeping plant where necessary;
- speed of vehicles limited to 10mph to reduce the potential for dust;
- minimisation of discharge/loading heights; and
- dust monitoring through visual inspection.

7.103 The increased throughput has the potential to increase the sources of dust emissions. The existing mitigation measures in place would also mitigate these additional sources of dust, as the volume has just increased rather than the nature of the operations.

7.104 In addition to those already implemented onsite additional mitigation measures are recommended based on previous and existing best practice guidance including those with the EA note²⁷:

- dust emissions during the transfer of materials should be minimised by ensuring drop heights are minimised wherever practicable and that double handling of material is also minimised. Drop heights can be minimised and spillages reduced by matching shovel and dump truck. The correct matching of machines also helps to prevent overloading of dump trucks and hence prevents spillage;
- no idling of vehicles;
- site planning to locate particulate emitting activities at a greater distance and downwind from receptors may reduce receptor exposure;
- ceasing operations during high winds and/or prevailing wind direction;

²⁶ Warren Heath Recycling Facility. Environmental Permit Application. Dust Management Plan. 412.00842.00004/DMPv2. September 2012.

²⁷ Environment Agency. Guidance for dust and particulate abatement techniques at Waste Management Facilities. Quick Guide 02/13. 02/01/2013.

- minimisation of waste storage heights which should reduce the distance over which debris, dust and particulates could be blown.
- 7.105 The trackout of dust onto the haul road and local road network was assessed as 'medium risk'. Risk specific mitigation measures in accordance with IAQM guidance, some of which are already implemented onsite include:
- use water-assisted dust sweeper on the access and local roads to remove as soon as practicable any material tracked out of the site;
 - ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport;
 - inspect on-site haul roads for integrity and instigate necessary repairs to the surface as soon as practicable;
 - implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site); and
 - impose an appropriate speed limit around the site.
- 7.106 Construction of the bund would be undertaken while existing operations continue onsite. Specific mitigation measures for the construction of the bund which would be undertaken in addition to current operational mitigation measures include:
- minimise drop heights while handling material;
 - undertake activities with regard to weather conditions;
 - water suppression to be used as necessary;
 - profiling of bund to reduce dust entrainment; and
 - seeding the bund as soon as possible.
- 7.107 A summary of the effectiveness of mitigation measures is provided in Table 7-6.

Table 7-6: Summary of Dust Control Measures and Estimate of Effectiveness

Site Operation	Dust Control Measures	Estimate of Effectiveness
Bund Construction	Minimise the duration of activity	High/Moderate
	Avoid soils handling during adverse weather conditions	High
	Bunds to be seeded when practicable on completion.	High
	Water sprays to be used as necessary	High
Material Handling and Processing	Use of water sprays as and when necessary on processing equipment and stockpiles	High
	Temporary cessation of activities in the event of unacceptable dust emissions in the vicinity of receptor properties.	High
	Drop heights to be minimised at all times	Moderate
	Avoid double handling of material where possible	Moderate/Low
Haul Roads/trackout	Controlled use of haul routes	Moderate/High
	Haul routes to be regularly maintained to minimise dust generation	High
	Speed controls to be implemented and enforced on all haul routes	Moderate
	Water bowsers to be used as required	High

	Road to be swept as an when necessary	High
	Sheeting of vehicles when carrying load	Medium
	Wheel wash to be located at the exit of the site	Medium/High
	No idling of vehicles	Medium

RESIDUAL IMPACTS

7.108 With the continuation of the existing mitigation measures and the implementation of above mitigation measures, there is considered to be negligible residual impact from dust on the surrounding receptors.

CONCLUSIONS

7.109 This assessment has considered the potential air quality impacts of Warren Heath Recycling Centre as a result of increased tonnage, permanent retention of the site and construction of a bund. Activities associated with this development which have been assessed include material handling, storage, processing and transport of material.

7.110 Impacts on local air quality from traffic emissions have been assessed to be neutral, based on low traffic volumes of a maximum of 136 movements per day during the operational phase and 82 during the construction phase, which is below the screening criteria within the DMRB guidance.

7.111 The potential impacts of the development have been assessed in terms of potential emissions of particulates (dust). A qualitative assessment of dust was undertaken which identified a negligible impact at sensitive receptors.

7.112 Mitigation measures currently employed at the site are in accordance with the Dust Management Plan. Additional mitigation measures in accordance with best practice and for the construction of the bund have been proposed. The residual impact is considered to be negligible at all receptor locations.

7.113 Based upon the assessment of potential impacts introduced as a result of the Proposed Development, the development is considered to be suitable in terms of its impact on air quality.