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Nine Mile Point Waste Processing Facility

PPC Variation

Environmental Risk Assessment

V00

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Report

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4 Environmental Risk Assessment

Scope of Assessment

- 4.1 This Environmental Risk Assessment has been completed to support the Environmental Permit Variation application for a Waste Processing Facility in the Cwmfelinfach area of Caerphilly by Drumcastle Ltd (hereby referred to as “the Operator”).
- 4.2 A number of assessments have been considered to determine the environmental risks posed by the waste operation and to identify whether the level of risk is considered acceptable, in accordance with the guidance as described within the Environment Agency’s H1 Environmental Risk Assessment – Overview v2.1 December 2011 and associated annexes.
- 4.3 This report contains justification for all risk assessments completed or screened out from requiring further consideration and provides an overall assessment of the acceptability of the proposed waste facility.
- 4.4 Waste deliveries to the site will remain unchanged from the approved Permit. These are:
- Monday – Friday 07:30 – 18:30
 - Saturday 07:30 – 13:00
 - No handling operations will take place on Sundays or Public/Bank Holidays.
- 4.5 The site will be operational 24 hours a day 7 days a week. This is unchanged from the approved Permit.

Site Location and Environmental Setting

- 4.6 The Facility will be located at:
Nine Mile Point Waste Processing Facility
Nine Mile Point Industrial Estate
Ynysddu,
Cwmfelinfach,
Caerphilly,
NP11 7HZ
- 4.7 The National Grid Reference for the site is: ST 19235 91305. The site covers an area of approximately 1.09 hectares. The site is bordered by an industrial unit to the east, a road to the west beyond which are more industrial units, a road to the south beyond which is woodland and the Sirhowy River and to the north by woodland.

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- 4.8 The nearest residential properties are on New Road, approximately 470m northeast of the eastern edge of the site boundary and William Street, approximately 478m west of the western edge of the site boundary.
- 4.9 The prevailing winds at this site are from the west, west northwest and west southwest (based on regular observations recorded at the 'Caerphilly' monitoring station between April 2013 and May 2015 (<https://www.windfinder.com>)). Output for this station is included as appendix B.

Emissions and Associated Hazards

- 4.10 The site will deal with a maximum of 100,000 tonnes of waste per annum. This will comprise industrial, commercial, and household wastes. This is unchanged from the approved Permit.
- 4.11 This report follows the Environment Agency's Horizontal Guidance Notes H1 for Environmental Risk Assessments for installation Permits. This guidance identifies the following potential risks to the environment which must be considered and included in the assessment, if they are likely to be present:
- Odour Impacts;
 - Noise and Vibration Impacts
 - Impacts from Accidents;
 - Fugitive Emissions to Air and Water;
 - Controlled releases to Air;
 - Controlled discharges to Surface Waters;
 - Controlled discharges to ground or groundwater;
 - Site Waste;
 - Global Warming Potential.

Nearby Sensitive Receptors

- 4.12 Key receptors that have the potential to be impacted by emissions from the site are summarised in Table 4.1 below. Natural Resources Wales Heritage and Conservation Screening Report showed there to be no statutory designated sites near the facility.

Table 4.1 Sensitive Receptors

Receptor	Type	Distance (m)	Direction
The site is located close to other Industrial and Commercial units on the Nine Mile Point Industrial Estate. These lie to the east and west of the site. The closest of these is immediately adjacent to the facility.	Commercial	0	E
Sirhowy River	Ecological	35	S
Agricultural Land	Agricultural	150	S
Residential properties at New Road, Wattsville	Residential	470	NE
Residential Properties at William Street, Cwmfelinfach	Residential	478	W

Point Source Emissions

- 4.13 The removal of the gas burners and RTO associated with this variation means that there will no longer be any combustion emissions to air associated with the facility. The only emissions to air will be the treated air associated with the negative pressure in the building. As part of this variation, a carbon filter will be installed for the treatment of extracted air. This extracted air will be treated in the carbon filter before release via a stack. The proposed maximum emission limit from the top of the stack following the carbon filter will be 1,000 odour units per cubic meter (OUE/m³). This unit value for odour emissions is presented as a worst case scenario which under assessment, gave rise to no issues to the surrounding receptor areas. From our experience of carbon filter systems for odour treatment, associated with mechanical waste treatment facilities, the concentration of odour falls significantly below the proposed maximum emission limit of 1,000 units per cubic meter (OUE/m³).
- 4.14 Furthermore, the extracted air from the building will be treated via a dust filter prior to the carbon filter for odour. This dust filter remains unchanged from the process previously approved under the Environmental Permit.
- 4.15 Based on the above unchanged process for dust management and the modelling of the worst case odour emissions from the carbon filter the proposed variation presents no environmental or amenity risks to the surrounding receptor areas.

Table 4.2 Point Source Emissions to Air

Air Emission Point Reference and Location	Receiving Media	Source of Emission
A1	Release into the Atmosphere	Extracted air treated with a carbon filter and released to the atmosphere via stack.

4.16 There will be no point source emissions to groundwater or water aside from surface water and clean roof water drainage from the site as described on Table 4.3 below. This remains unchanged from the current approved Permit.

Table 4.3 Point Source Emissions to Water

Emission Point Ref.	Potential Emissions	Pollution prevention measures	Comments	Discharges to
SW Outfall Approximate NGR: ST 19178 91244	Sediment and oils	Class 1 full retention interceptor with alarm	Surface water run-off from site and oil interceptor and clean roof water (inspected visually)	Storage crates then into existing surface water drain. Drawing reference 20001-403

4.17 The whole site will be located on an impermeable hardstanding. Waste will be brought onto site and placed in the Waste Reception Building for segregation. The floor of this building will be impermeable hard standing. In order to produce a SRF, the waste required will be dry in nature and therefore there will be no runoff from the process within the building.

Environmental Risk Assessment

Scope of Assessments Completed

4.18 A number of assessments have been considered to determine the environmental risks posed by the facility and to identify whether the level of risk is considered acceptable.

4.19 In accordance with Environment Agency Guidance EPR H1, the following annexes should be used to assess the potential impacts on sensitive receptors from 'Other Waste operations' which includes this proposed facility:

- Annex (A): Amenity and Accidents;
- Annex (D): Surface Water (basic);

- Annex (F): Air;
 - Annex (G): Site Waste; and
 - Annex (K): Justifying and Cost Benefit Analysis of Control Measures.
- 4.20 As there will be no point source emissions to water (other than surface water), an Annex D assessment has not been undertaken as part of this Environmental Risk Assessment. Foul drainage is discharged via sewer.
- 4.21 Annex K, a cost benefit analysis, has not been undertaken as part of this Environmental Risk Assessment as no more than one option for the site is being considered.
- 4.22 A Noise Assessment will be carried out in accordance with BS4142: 1997 '*Method for rating noise affecting mixed residential and industrial areas*'.
- 4.23 The proposed Waste Processing Facility will be operated in compliance with requirements detailed in the relevant technical guidance notes, specifically the Environment Agency's *Technical Guidance Note S5.06, Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste*. Techniques to minimise the environmental impacts associated with the facility are outlined in the Operations Technique and Monitoring Plan and in the Risk Assessments presented in Appendix A of this report.

Annex A- Amenity and Accidents Overview

- 4.24 A summary of the amenity and accident risks from the proposed installation facility is provided in Appendix A to this report. The potential impact of risks identified to nearby sensitive receptors have been determined to be either insignificant, or insignificant following the application of appropriate mitigation and control measures. The key risks, mitigation and control measures proposed at Nine Mile Point Waste Facility are further summarised below.

Accidents

- 4.25 There is potential for exposure from accidents or incidents on site to anyone living or working close to the site. The key sensitive receptors identified include the neighbouring industrial units and local human population.
- 4.26 Key potential hazards identified include, on site hazards from machinery and vehicles, fires resulting from arson and vandalism and accidental fires. Although these are recognised as potential risks the likelihood of them occurring remains low.
- 4.27 Based on the output of the risk assessment in Appendix A, the potential risk from accidents is low. Proposed management and mitigation controls will ensure that all activities will be managed and operated in accordance with the Integrated Management System Policy which

brings together all Quality, Environmental and Occupational Health and Safety requirements (which will include site security measures to prevent unauthorised access, and fire and spillage procedures).

- 4.28 Full details of control measures to minimise the impact of accidents compared with requirements detailed in the relevant technical guidance notes is described in the Operations Techniques and Monitoring Plan.

Odour

There is potential for exposure to odour to anyone living or working close to the site. Key potential impacts identified include odour from waste delivery vehicles, vehicles transporting the RDF/SDF off site, and odours from the reception area.

- 4.29 The key sensitive receptors identified for odour are considered to be users of the Nine Mile Point Industrial Estate adjacent to the facility, and residents of the Wattsville to the east of the facility and Cwmfelinfach to the west of the facility although the residents are some 470m or more from the facility. Recreational users of the Sirhowy River (South) may also become sensitive receptors if any major odour incident occurred.
- 4.30 An Odour Assessment was carried out by Air Quality Consultants Ltd in October 2021 in order to assess the potential odour risks posed by the revised waste processing facility. A copy of their assessment is provided in Appendix C of this report.
- 4.31 Potential odour sources are most likely to arise from odorous components of the general waste stream. Only a small proportion of wastes accepted and stored on-site are likely to generate odorous emissions amounting to approximately no more than 10% of the waste throughput. The facility shall use the 'first-in', 'first-out' waste handling practices, reducing as far as possible the residency time of materials on site. Extracted odorous air from the waste reception and processing building will be treated with a carbon filter prior to its release to the atmosphere via a stack.
- 4.32 There are a number of sources at the waste processing facility where there is a potential for odours to be released into the outside environment. The main potential odour sources have been identified and a detailed inventory of potential odour sources along with appropriate mitigation and control measures are provided in Chapter 8 of this Application, the Odour Management Plan (OMP) produced specifically for Nine Mile Point Waste Facility. A copy of the OMP is provided within this Application as Chapter 8. The Site Manager will be responsible for implementing the OMP.

- 4.33 Following the treatment of odorous emissions through a carbon filter, and through the restricted acceptance of only dry non-hazardous waste, and by employing the techniques outlined in the Odour Management Plan, odour is not anticipated to cause a significant impact.

Noise and vibration

- 4.34 In addition to the qualitative assessment, as there are noise generating sources on-site, impact from noise has been assessed in accordance with Environment Agency's Horizontal Guidance for *Noise H3 Part 2 – Noise Assessment and Control* and BS4142: 2014 '*Method for rating and assessing industrial and commercial sound*' and provided as part of the previously approved application.
- 4.35 The assessment concluded that '...subject to the implementation of the inherent design measures, noise from the proposed activities would be considered by the Standard be an indication of the specific sound source having a low impact. As such it is considered that noise associated with the operation of the proposed facility would not be significantly detrimental to the noise climate of the area and should not preclude the granting of planning permission on the grounds of noise, subject to the implementation of appropriate mitigation measures'.
- 4.36 Full details of control measures to minimise noise emissions compared with requirements detailed in Sector Guidance Note '*S5.06: guidance on the recovery and Disposal of Hazardous and Non-Hazardous Waste*' Environment Agency 2004 is described in the Operations Techniques and Monitoring Plan.
- 4.37 Under the current approved Permit mechanical waste processing equipment is located outside. This includes the dryer and RTO's. This Permit Variation seeks to remove the dryer and RTO's. Therefore, noise emissions from the facility will remain unchanged and will most likely be reduced due to the removal of external waste processing equipment.

Fugitive Emissions to Air

- 4.38 The key sensitive receptors identified in close proximity to the site are users of Nine Mile Point Industrial Park, residents of the Wattsville to the east and Cwmfelinfach to the west.
- 4.39 Fugitive emissions considered as potential hazards from the facility include the generation of dust, release of particulate matter and the release of odours.
- 4.40 The primary potential sources for fugitive releases to air are likely to be from the waste reception building.
- 4.41 All waste acceptance, processing and storage will take place inside the building.
- 4.42 A dust suppression system will be in place in the waste reception and processing building. The air extracted from the building will be passed through dust filters prior to the carbon filter.

Emissions of dust will remain unchanged as part of this variation as the dust filter is to remain as part of the treatment process.

- 4.43 Air from the waste acceptance and processing building will be directed through the carbon filter prior to release into the atmosphere to destroy odours.
- 4.44 Activities on site will be managed in accordance with the operator's management systems. This will include regular inspections and maintenance of equipment, including all point source emissions to air to ensure risks of fugitive emissions from site are kept to a minimum.
- 4.45 The assessment in Appendix A concludes that the potential hazard from fugitive emissions to air is considered to be low based on the control measures in place.
- 4.46 A standalone Odour Management Plan has been prepared to support this application and is provided within this application as Chapter 8. The approved plan will be included within the site's operational environment management system.
- 4.47 Full details of control measures to minimise fugitive emissions to air compared with requirements detailed in the relevant technical guidance notes are described in the Operations Techniques and Monitoring Plan in Chapter 5.

Fugitive Emissions to Water and Land

- 4.48 The site is over a Groundwater Vulnerability Zone which is a minor aquifer with high leaching potential. There are no groundwater or surface water abstraction licences within 2km of the facility. Receptors identified are the ground and groundwater beneath the site. The site is not within a Source Protection Zone.
- 4.49 The site has been engineered to provide robust containment to minimise risks of fugitive emissions to groundwater. Full details of containment measures for liquids stored on-site are provided in the Operational Techniques and Monitoring Plan and are summarised below.
- 4.50 Activities will be managed in accordance with the operator's management systems, and all areas that have the potential for contaminated run-off will be sealed and serviced with a secondary containment system.
- 4.51 Training will be provided to all staff relating to the use of spill kits and the spill clean-up procedures.

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- 4.52 All site personnel will be tasked with monitoring for evidence of spillages and leakage during their day to day routine. Any evidence of spillage or leakage will be reported to the Site Manager or his nominated deputy for remedial action.
- 4.53 Surface water from the external areas of site will drain to storage crates for attenuation. Surface water will then be released to the existing surface water drainage system on the industrial estate. All surface water run-off will pass through full retention separators. These will be inspected on a regular basis to check their integrity and be maintained to prevent overflowing.
- 4.54 Full details of control measures to minimise fugitive emissions to water compared with requirements detailed in the relevant technical guidance notes is described in the Operational Techniques and Monitoring Plan.
- 4.55 Based on the output of the risk assessment in Appendix A of this report, the potential risk to the environment from fugitive emissions to water is considered to be low. The main pollutant risks would be sediment from run-off from stockpiles which are not contained and oils from accidental release from the fuel oil store.

Pests

- 4.56 The key sensitive receptors identified for pests include the local human population, and users of the site itself. Potential hazards include vermin and flies attracted to wastes delivered and stored on site. Areas which could attract pests are the reception building and stored RDF/SRF.
- 4.57 The facility has been designed and will be operated in such a way that the attraction of animals, vermin, pests, and flies is reduced to a minimum. All waste acceptance activities are carried out within a building. Wastes arriving at the site will be managed using the 'first-in', 'first-out' waste handling practice, reducing as far as possible the storage time of untreated materials at the facility.
- 4.58 The site will be carefully managed including good housekeeping procedures and regular checks will be made within and around the site for litter and spillages. In addition, the site access and highway outside will be regularly inspected to ensure the access routes in and out of the facility are kept clean.
- 4.59 The facility will have a vermin/pest control contract set up with a pest control specialist prior to operations commencing. Monthly pest control inspections will be carried out by the contractor. The effectiveness of the techniques will be kept under review and appropriate modifications implemented if required. Records of all vermin and pest control visits and initiatives will be maintained and will be available for inspection by the relevant authorities. Regular checks and recording of potential pests will be carried out and corrective actions will be initiated.

4.60 Full details of control measures to minimise infestation with pests compared with requirements detailed in the relevant technical guidance notes is described in the Operational Techniques and Monitoring Plan.

Mud and Litter

4.61 Generation of mud is highly unlikely as the site is surfaced with hardstanding throughout. Mud has therefore been discounted as a potential hazard.

4.62 Litter can potentially be generated from the incoming waste materials; however, all waste material will arrive onto site in enclosed or sheeted vehicles. All waste delivery vehicles will have their wheels cleaned prior to exiting the reception building, if needed, to ensure no litter is tracked out of the building.

4.63 Waste acceptance and de-packaging will occur inside a building in a controlled environment.

4.64 In addition, management controls to be implemented include good housekeeping practices and undertaking routine visual inspections of the site and its immediate environs to identify any litter.

4.65 Any issues identified will be noted in the site diary, investigated and appropriate remedial action taken.

Annex F – Air Emissions

4.66 Emissions abatement techniques to be employed on site are described in the Operational Techniques and Monitoring Plan.

Annex G – Site Waste

4.67 The primary purpose of this Facility will be to produce quality RDF/SRF which can be sent onwards to be used to produce energy.

4.68 In consideration of the above and in line with the requirements of H1 Annex (g), the proposed operations do not require detailed disposal or recovery consideration as the principal reason for the facility is to treat waste materials for the production of RDF/SRF which is to be used as a fossil fuel replacement.

4.69 Annex G of the guidance states that the environmental impact of the waste produced by an activity should be considered if it fits within one of the following two categories:

- You are choosing between disposal/recovery options available for the waste you produce or
- You are carrying out a BAT options appraisal of candidate emission control techniques.

4.70 For all wastes produced on site the waste hierarchy system as defined within the Waste Framework Directive will be applied, with the option of disposal considered as only once all other options have been considered.

4.71 Neither of the above two categories are required to support this application, thus H1 Annex G is not considered further.

Conclusion

4.72 A number of environmental risk assessments have been carried out to determine whether the proposed Nine Mile Point Waste Processing Facility can be operated without causing pollution of the environment. All risk assessments have been undertaken in accordance with relevant Natural Resources Wales Guidance and best practice.

4.73 The assessments undertaken consider the possible impacts on sensitive receptors from the range of potential emissions from the waste operation. The risk assessments have considered both the intended design and operational practices at the site and conclude that:

- The overall risk to receptors from odour is considered as not being significant however the site will have an Odour Management Plan in place which will be routinely reviewed to ensure operation control measures remain appropriate;
- Following implementation of management measures and controls, fugitive emissions to air and water are considered as not being significant: the waste accepted to the site are unlikely to cause pollution as all treatment and storage of waste which may generate pollution are adequately contained to prevent release;
- The overall risks from vermin, pests and litter are considered as not being significant due to the control measures in place and the minimal volume of waste containing food sources;
- The overall risk to receptors from accidents is considered low due to the low-risk nature of activities on the site, however the Operator will implement an Accident Management Plan as part of the Integrated Management System Policy following Permit issue which will be routinely reviewed to ensure operation control measures remain appropriate;
- An assessment of noise from the facility has concluded that the operation of the proposed facility would not be significantly detrimental to the noise climate of the area subject to the implementation of appropriate mitigation measures.
- An assessment of the air quality from the facility has concluded that the operation of the facility would not be significantly detrimental to the air quality of the area subject to the implementation of appropriate mitigation measures.

- Waste streams produced by the site operators can be screened out as being insignificant as the primary purpose of the Waste Processing Facility is to produce by-products which can be reused. The RDF/SRF is being transported off site to be used as energy.

4.74 In light of the above, the proposed waste processing facility is not considered to represent an unacceptable risk to the environment.

Appendices

Appendix A- Amenity and Accident Risks

Table 1: Assessment of Odour Risks

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
<i>What is the hazard to the Environment?</i>	<i>What is the agent or process which has the potential to cause harm?</i>	<i>How might the receptor come into contact with the source</i>	<i>What is at risk?</i>	<i>Likelihood of contact?</i>	<i>How Severe will the consequences be if this occurs?</i>	<i>What is the overall magnitude of risk?</i>	<i>Proposed operational control measures to be implemented on site to manage the risk and reduce the magnitude?</i>	<i>What is the residual risk after management?</i>
Nine Mile Point Waste Processing Facility								
Odours from waste delivered to and transported from site	Odorous waste in vehicles	Air Prevailing wind direction is from the west	Site employees Members of the public Local residents Workforce at and users of the local industrial estate	Low	Moderate	Moderate	<ul style="list-style-type: none"> ▪ Wastes will be delivered to the facility via the road in enclosed or sheeted vehicles. ▪ Potentially odorous wastes typically comprise less than 10% of wastes received. ▪ Odour Management Plan implemented. ▪ Operational controls in place to strictly control waste types accepted on site. ▪ Particularly odorous deliveries refused entry. 	Low - if operational procedures and working practices followed consistently.

							<ul style="list-style-type: none"> ▪ Vehicles cleaned and inspected before leaving site to remove odorous or biodegradable material if required. ▪ Vehicles sheeted before leaving site. ▪ Daily odour assessments carried out at the site boundary and appropriate action taken if required, more frequently during warm weather. ▪ Operational procedures are in place to deal with odour events or complaints and records are maintained. ▪ Staff trained appropriately to respond to odour issues with records maintained. 	
Odour from wastes stored on-site	Odorous waste stored on-site	Air	Local residents, workforce on the industrial estate, users of amenity sites	Low	Moderate	Moderate	<ul style="list-style-type: none"> ▪ Odour Management Plan implemented. ▪ Potentially odorous wastes are only stored and processed within reception building at all times. ▪ If not identified in pre acceptance procedures and accepted onto site highly odorous waste is stored for less than 24 hours. ▪ Regular cleaning of the site to prevent build-up of odorous or biodegradable 	Low - if operational procedures and working practices followed consistently.

							<p>materials and to clean up spillages of odorous or potentially odorous material.</p> <ul style="list-style-type: none"> ▪ Waste arriving at the site will be processed in a timely fashion using the 'first in' – 'first – out' principle. ▪ Daily odour assessments carried out and appropriate action taken if required, more frequently during warm weather. ▪ Operational procedures to deal with odour events or complaints. ▪ Staff trained appropriately to respond to odour issues with records maintained. 	
Odour from failure of plant equipment.	Point source emissions	Air Prevailing wind	Site employees Members of the public and local residents and industrial estate users	Low	Moderate	Moderate	<ul style="list-style-type: none"> ▪ Activities will be managed in accordance with the operator's management systems. This will include regular inspections and maintenance of equipment to ensure they continue to operate at optimum conditions. 	

Table 2: Noise and Vibration

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Noise and vibrations	Vehicle movements to and from and on-site	Noise through the air and vibrations through the ground	Local residents, workforce on the industrial estate, users of amenity sites	Low	Low	Low	<ul style="list-style-type: none"> ▪ Vehicle movements into and out of the site will only take place during the normal working day. ▪ All roadways will be surfaced with no significant undulations and with 'non-squeal' surfaces. ▪ Vehicles will be subject to regular maintenance and service schedules. ▪ All vehicles and plant will be fitted with up to date technology including "white noise" reversing alarms or intelligent alarms that can only be heard in the immediate vicinity. ▪ All vehicles will not be allowed to idle when not in use- ▪ Operational procedure in place to deal with complaints about noise with records maintained. ▪ Staff trained appropriately to be able to respond to noise 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
							<ul style="list-style-type: none"> issues or incidents with records maintained. 	

Table 3: Fugitive Emissions to Air

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Releases of particulate matter	Releases of dust from roadways and loading/unloading activities	Air transport then deposition or inhalation	Site employees Members of the public, local residents and workforce at industrial estate	Moderate	Moderate Annoyance/ Nuisance Health Risks – respiratory irritation and/or illness	Moderate	<ul style="list-style-type: none"> Daily visual assessment of the site condition by the Site Manager. All site operatives to be vigilant and report any problems immediately to the Site Manager to implement appropriate corrective action. Using water bowser or hoses to damp down yard and access road in dry weather. Adequate water supply maintained to supply water bowser or hoses. Site sweeping or cleaning of all paved areas, especially in dry and/or windy weather. 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
							<ul style="list-style-type: none"> ▪ 15mph speed limit on site for all vehicles. ▪ Vehicle wheels cleaned prior to leaving site if required. ▪ Ensuring skips are covered when delivering to site or when removing waste from site. ▪ Staff trained appropriately to minimise emissions of dust and records maintained. 	
Releases of particulate matter	Dust Abatement Through Filters	Air transport then deposition or inhalation	Site employees, members of the public, local residents and workforce at industrial estate	Moderate	Moderate Annoyance/ Nuisance Health Risks – respiratory irritation and/or illness	Moderate	<ul style="list-style-type: none"> ▪ All activities are carried out within the main reception building. A dust extraction system will be in place consisting of dust filters on the extracted air and targeted dust filters on specific items of waste processing equipment. These filters will collect dust and convert it to a solid form. 	Low

Table 4: Fugitive Emissions to Water

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Contaminated runoff/rainwater from site surfaces	Loss of containment of wastes on site.	Percolation through soils, direct run-off from site across the ground and entering surface water drains or natural channels / ditches and groundwater	Pollution of nearby surface water; Sirhowy River, groundwater, and land.	Moderate	Deterioration of groundwater quality and surface water quality	Moderate	<ul style="list-style-type: none"> ▪ The site will be constructed with impermeable surfaces. ▪ The waste accepted will be dry in nature to ensure the quality of the SRF. There will be no runoff in the MRF building. ▪ Surface water from the roof and site surface water will be directed to storage crates. This water will then be discharged to existing surface water drainage system following treatment in full retention oil interceptors. ▪ Records will be available and kept up to date of all drainage structures including the routing of all drains and the identification of all storage crates. ▪ Operational procedures will ensure the drainage system and condition of the hard standing areas are inspected daily by the Site Manager and any damage is repaired and to the original construction specification. 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
							<ul style="list-style-type: none"> ▪ Clean up procedures will be implemented to deal with fuel or other spillages or leaks of potentially polluting liquids. All staff will be trained in the procedures and correct use of equipment and sufficient spill kits will be maintained on site. These procedures will include the use of booms or drain mats to seal all drains during the spill event. ▪ Staff trained appropriately to minimise emissions to water and records maintained. 	
Chemicals and oils stored on site	Loss of containment on site	Percolation through soils, direct run-off from site across the ground and entering surface water or groundwater	Nearby natural habitats.	Low	Moderate	Moderate	<ul style="list-style-type: none"> ▪ Fuel for onsite plant will be stored in self bunded tanks. These will be inspected weekly for defects. ▪ Only maintenance oils will be stored on site. ▪ Maintenance oils will be stored within the maintenance department and will be stored within a bund on hardstanding. 	Low

Table 5: Pests

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Pests (flies, vermin, birds) attracted to the waste materials	Pests	Air transport and over land	Site employees Users of local amenity areas Members of the public and local residents & users of the industrial estate Nearby natural habitats.	Low	Low	Low	<ul style="list-style-type: none"> ▪ Low proportion of wastes on-site which may attract pests (<10% of total throughput). ▪ Waste acceptance activities are carried out within a building. Waste arriving at the site will be processed in a timely fashion using the 'first in' – 'first – out' principle. ▪ Daily inspection includes visual monitoring for pests with records maintained. ▪ Vermin/pest control contract will be set up with a pest control specialist prior to operations commencing. Records of all vermin and pest control visits will be maintained. ▪ Records will be kept to monitor the frequency of pest infestations and the effectiveness of control measures put in place. 	Low

Table 6: Mud and Litter

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Litter	Litter blown off waste	Air transport then deposition	Site employees Users of local amenity areas Members of the public and local residents & users of the industrial estate Nearby natural habitats.	Moderate	Low	Moderate	<ul style="list-style-type: none"> ▪ Waste is delivered to and stored within the reception building. ▪ All wastes will arrive on site in enclosed or sheeted vehicles. ▪ Good housekeeping practices to monitor litter levels on a daily basis and take appropriate action both on the site, on the site fences and in the immediate environs if required.; ▪ Incidents of litter problems to be logged; ▪ Litter inspections will be carried out on daily basis, and any litter will be cleaned up on an ongoing basis and at least at the end of each working day. ▪ Staff trained appropriately to minimise emissions of litter and records maintained. 	Low
Mud	Mud from vehicle movements in and	Tracking from vehicles entering and leaving the site.	Site employees Members of the public and	Low	Low	Low	<ul style="list-style-type: none"> ▪ The site is surfaced with hardstanding and there are no areas which could generate mud. The site access will be regularly inspected. Any issues identified will be noted in the site 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
	out of the site		local residents & industrial estate units Nearby natural habitats.				diary, investigated and appropriate remedial action will take place as soon as practicable.	

Table 7: Accidents

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Vehicle collision	All on-site machinery and vehicles	Direct physical contact	Drivers, on-site staff, and neighbouring premises	Low	Moderate	Moderate	<ul style="list-style-type: none"> Activities shall be managed and operated in accordance with a management system (which will include site security measures to prevent unauthorised access). An Accident Management Plan will be compiled to manage foreseeable risks from the installation. 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Arson and / or vandalism causing fire and the release of polluting materials to air (smoke or fumes), water or land.	Unauthorised access	Air transport of smoke then inhalation. Spillages and contaminated firewater by direct run off from site.	Site employees Users of local amenity areas Members of the public and local residents & users of the industrial estate Nearby natural habitats.	Low	High	Moderate	<ul style="list-style-type: none"> ▪ Activities shall be managed and operated in accordance with a management system (which shall include fire and spillage procedures). An Accident Management Plan will be compiled to manage foreseeable risks from the installation. ▪ A Fire Prevention Plan will be compiled to manage foreseeable risks from the installation. ▪ The site shall have a monitored fire detection and alarm system. ▪ A full fire suppression system will be installed onsite including sprinklers and deluge systems. ▪ Site security measures to prevent unauthorised access will include a perimeter security fence, security gates and CCTV monitoring. ▪ Security gates will be kept locked and secured outside normal working hours. 	Low

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
Accidental fire causing the release of polluting materials to air (smoke or fumes), water or groundwater.	On-site machinery Combustion of waste.	Transportation through air then inhalation. OR Transportation through air the deposition Spillages and contaminated firewater by direct run off from site.	Site employees Users of local amenity areas Members of the public and local residents & users of the industrial estate. Nearby natural habitats.	Low	Moderate	Moderate	<ul style="list-style-type: none"> ▪ Activities shall be managed and operated in accordance with a management system (which shall include site security measures to prevent unauthorised access). ▪ Guidance provided in Environment Agency's 'Fire Prevention Plans, Version 2, March 2015' will be applied to site operations as required. This includes the maximum storage time of RDF/SRF on site to be 3 months ▪ All plant and equipment and electrical installations will be kept maintained and in good working condition and subject to routine inspection and maintenance. ▪ An Accident Management Plan will be compiled to manage foreseeable risks from the installation. ▪ A Fire Prevention Plan will be compiled to manage foreseeable risks from the installation. 	Low

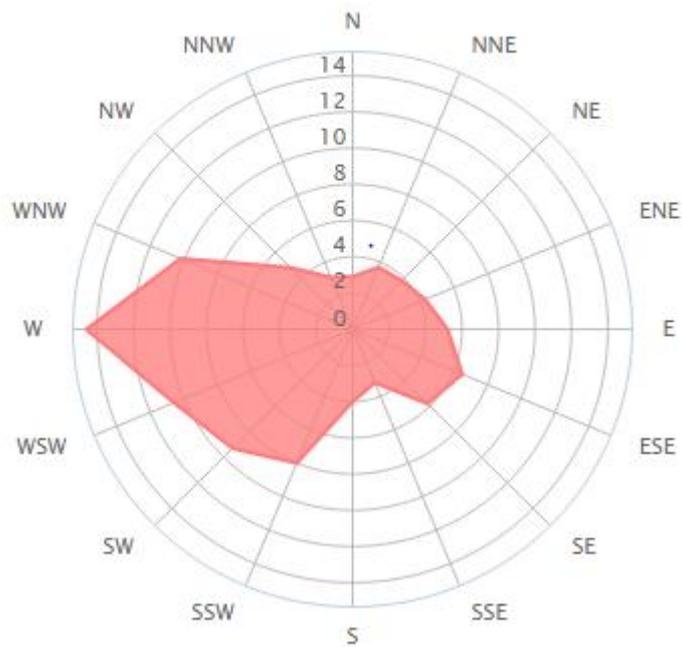
Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
							<ul style="list-style-type: none"> ▪ Site security measures to prevent unauthorised access will include total fencing of the site, security gates. ▪ Security gates will be kept locked and secured outside normal working hours. ▪ The site Management System will include procedures and actions required in the event of fire or spillage to control and minimise their spread. ▪ Firefighting equipment will be maintained on site in accordance with fire regulations. ▪ A full fire suppression system will be installed onsite including sprinklers and deluge systems. ▪ The site will enforce a No Smoking Policy which will be strictly enforced by Site Rules and by signage around site. ▪ No waste will be burned on site. ▪ Good housekeeping measures will be employed across the site. 	

Hazard	Source	Pathway	Receptor	Probability of Exposure	Consequence	Magnitude of risk	Risk Management	Residual risk
							<ul style="list-style-type: none"> ▪ Any fire on site will be treated as an emergency and will be extinguished at the earliest opportunity utilising local Fire & Rescue Services if required. ▪ All Site staff will be fully trained in the fire procedure and the use of firefighting equipment. Any incidents of fire will be reported to Natural Resources Wales and recorded in the site diary. ▪ Waste will be moved off site regularly 	

Appendix B- Caerphilly Weather Station Data

Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant Wind dir.	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤
Wind probability ≥ 4 Beaufort (%)	19	23	18	21	21	11	8	11	5	14	6	24	15
Average Wind speed (kts)	6	7	7	8	7	6	6	6	5	6	4	7	6
Average air temp. (°C)	8	8	10	13	15	19	23	19	17	15	11	9	13

Wind direction distribution in (%)
Year



Appendix C - Air Quality and Odour Assessment



Odour Assessment: Nine Mile Point, Caerphilly

October 2021



Experts in air quality
management & assessment

Document Control

Client	WDR & RT Taggart Architects & Engineers	Principal Contact	Adrian Thompson
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Job Number	J10/12921A/10
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Report Prepared By:	Paul Outen
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Document Status and Review Schedule

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1 Introduction

- 1.1 This report describes the assessment of odour impacts and effects associated with the proposed amendments to the consented materials recycling facility at Nine Mile Point industrial estate in Caerphilly. The facility will sort, shred and bale recyclable waste to produce Solid Recovered Fuel (SRF). The facility has previously gained planning consent and an environmental permit for a materials recycling facility with gas-fired waste dryers and a Regenerative Thermal Oxidiser (RTO) to treat odorous air extracted from the facility. The amended development will remove the dryers and RTO and treat odorous process air extracted from the facility building using a carbon filter Odour Control Unit (OCU).
- 1.2 The assessment has been carried out by Air Quality Consultants Ltd (AQC) on behalf of WDR & RT Taggart Architects & Engineers and is provided to support both the application for discharge of the odour planning condition attached to the original planning permissions, as well as an environmental permit variation application to Natural Resources Wales (NRW).
- 1.3 It should be noted that there have been no significant changes to the facility's structure, or the types of waste being handled, since the previous environmental permit and planning application were approved and as such these changes are being handled with a non-material amendment planning application. An important change to the process, however, is the removal of the waste dryers, the associated combustion plant, and the RTO, which has resulted in there now being no significant emissions of NO_x from the facility. Therefore, the impacts on air quality have been screened out, and this assessment addresses the potential for odour impacts, only.
- 1.4 The location of the facility and proposed OCU stack are shown in Figure 1.

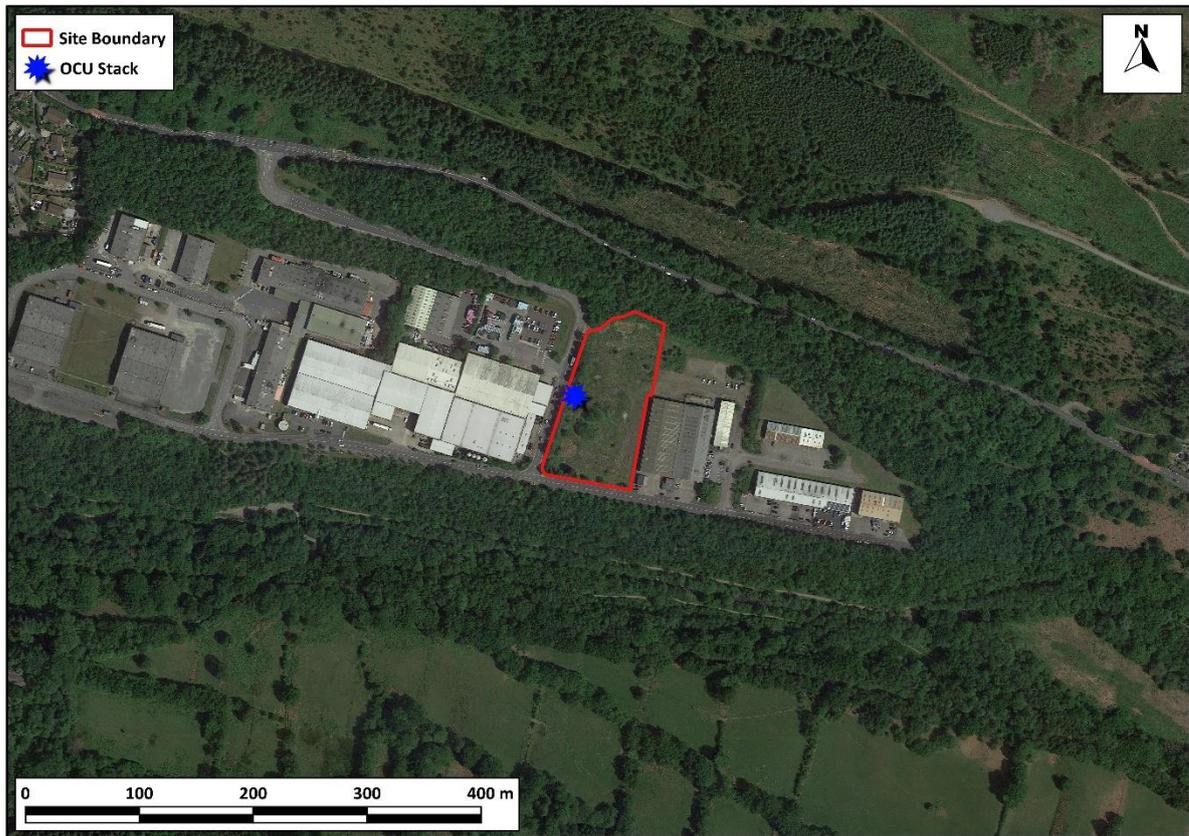


Figure 1: Location of Facility and Proposed OCU Stack

Imagery ©2021 Google.

- 1.5 The assessment identifies the potential odour impacts and effects associated with emissions from the proposed carbon filter using odour dispersion modelling.

2 Assessment Approach

- 2.1 Odour impact assessment is a challenging and subjective science. There are a number of odour assessment methods and tools that have been developed which are widely used in the UK, including desk-based methods, such as complaints analysis and qualitative risk assessment, through to field odour testing (sniff testing) and dispersion modelling. Each has its advantages and disadvantages and not all assessment methods are appropriate in every case; for example, where a potentially odorous process is proposed rather than existing, then assessment methods such as sniff testing and odour sampling are less relevant than predictive methods such as odour risk assessment. The scale and location of odorous processes is also important in selecting appropriate assessment methodologies, with more simple methodologies often sufficient for small or remotely located processes.
- 2.2 This assessment uses odour dispersion modelling to determine the potential odour impacts and effects from the proposed OCU stack.

Model Inputs

- 2.3 Odour dispersion modelling for the OCU stack has been carried out using the ADMS-5 dispersion model. A summary of the model input parameters are provided in Table 1 and the location of the modelled odour source is shown in Figure 1. All stack parameter data have been provided by WDR & RT Taggart Architects & Engineers. A residual OCU outlet odour concentration of 1,000 OU_E/m³ has been assumed and it is expected that the OCU can be specified to operate at or below this level. The volume flow rate has been calculated based upon a building extraction rate of 80,000 m³/hr. It has been assumed that the extraction system will run continuously and at a constant rate.

Table 1: Odour Model Input Parameters

Model Input Parameter	Value	Units
Stack Location (NGR)	319203.6, 191310.9	X, Y
Stack Height	16.0	m
Stack Diameter	1.39	m
Temperature	Ambient	°C
Efflux Velocity	14.64	m/s
Volume Flow	22.22	m ³ /s
Odour Concentration	1,000	OU _E /m ³
Odour Emission Rate	22,222	OU _E /s

Meteorological Data

- 2.4 The model has been run using five years of hourly sequential meteorological data (2016-2020) from Cardiff Airport, as a sensitivity test. Wind roses for the meteorological data used in the modelling are displayed in Appendix A3.
- 2.5 For the dispersion site, a variable surface roughness file was used; a visualisation of the variable roughness file is presented in Figure 2. The meteorological input parameters for the modelling are set out in Table 2.

Table 2: Meteorological Data Model Input Parameters

Site	Surface Roughness	MO Length	Priestley-Taylor Parameter
Cardiff Meteorological Site	0.3	10	1
Dispersion Site	Variable roughness file	10	1

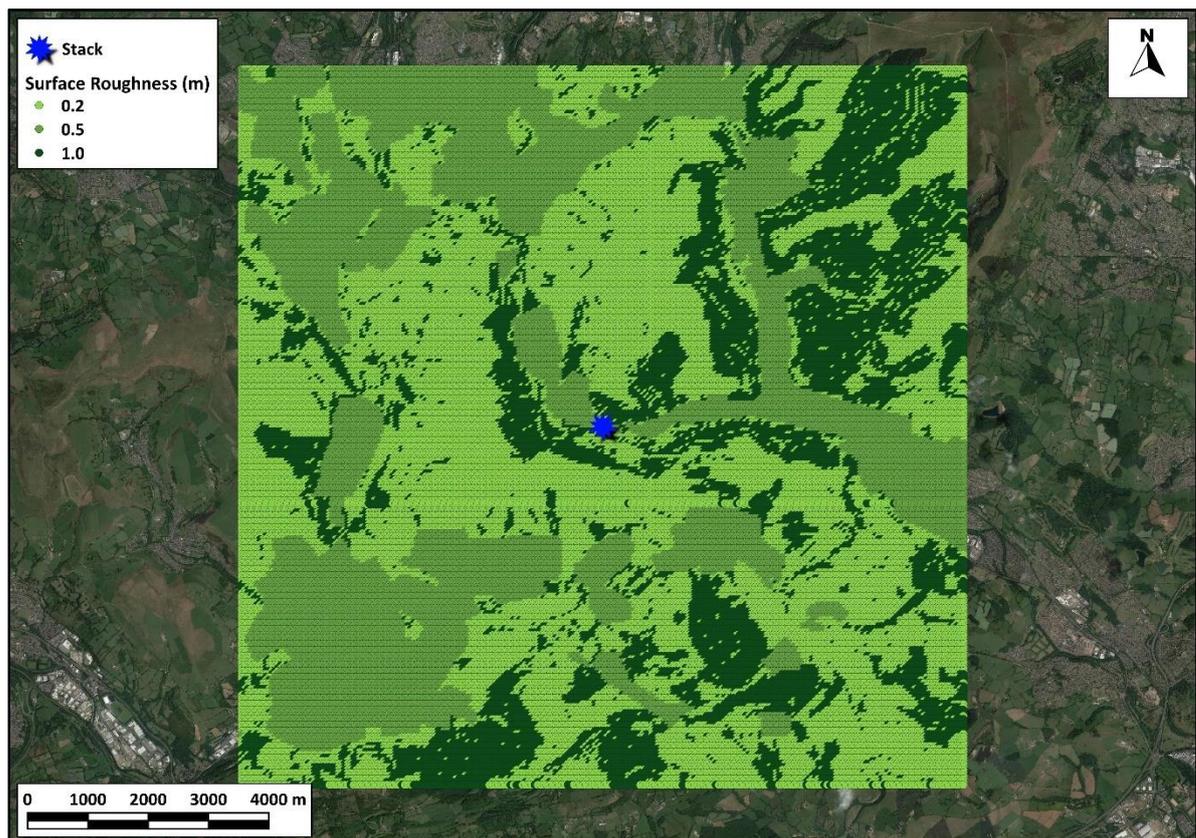


Figure 2: Variable Surface Roughness File

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Terrain

2.6 Local terrain has been included within the model based on OS Terrain 50 data. The terrain data used in the model are shown in Figure 3.

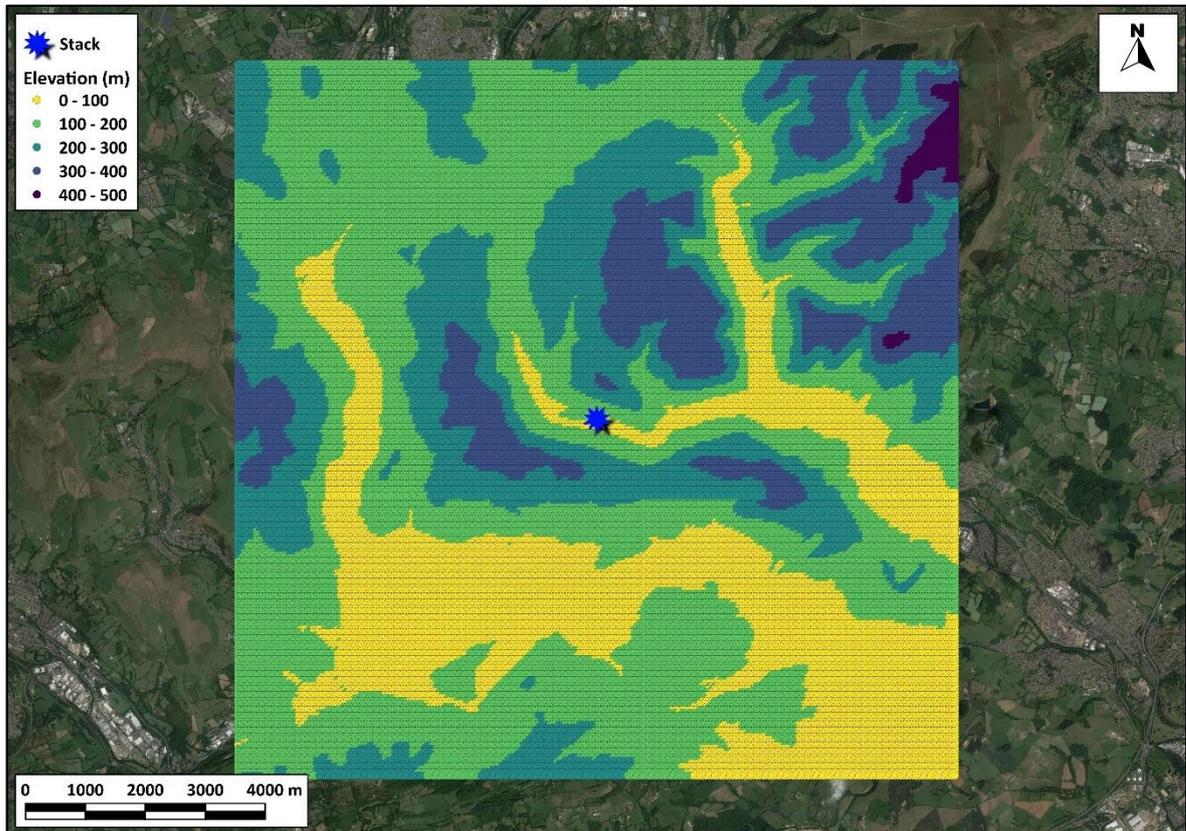


Figure 3: Terrain Data

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Treatment of Buildings

2.7 The model has been run for two buildings scenarios; firstly, using the buildings module, set up to include the main facility building; and secondly, without the buildings module. The modelled building is shown in Figure 4, and its parameters are set out in Table 3.

Table 3: Building Parameters

Building	X, Y	Height	Length (m)	Width (m)	Angle (°)
Main Facility	319232.6, 191298.9	14 m	44.37	80.25	103.46

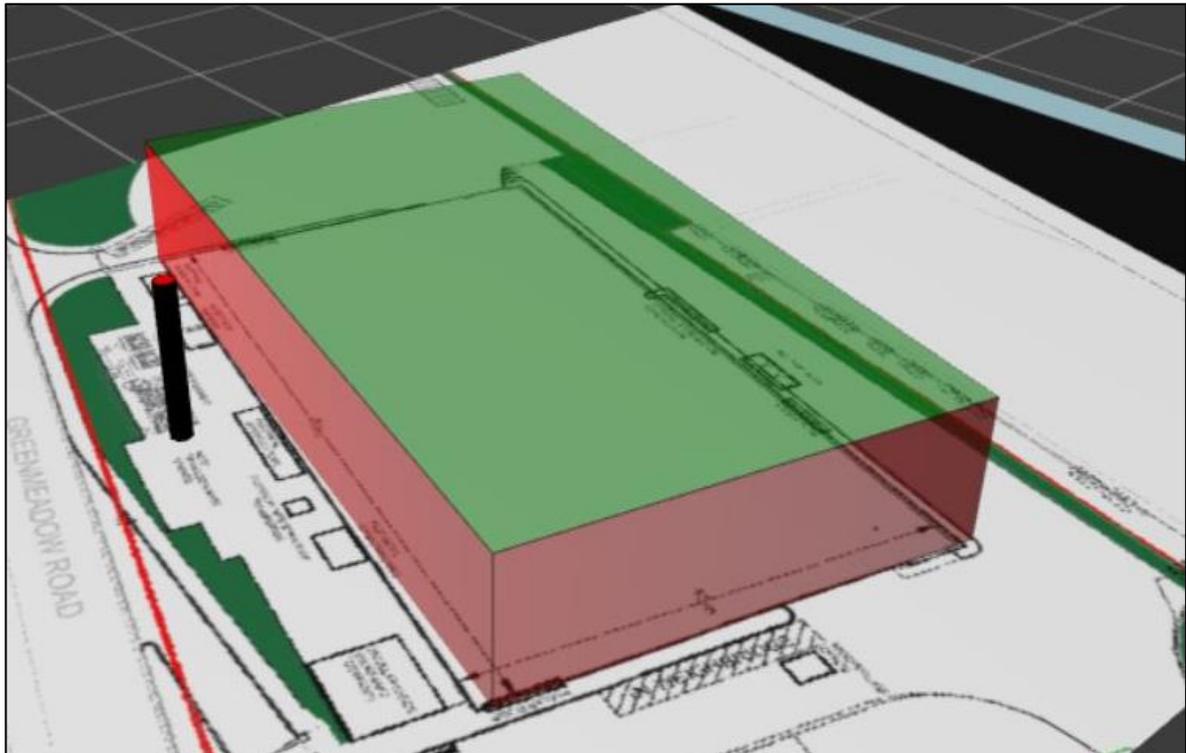


Figure 4: Modelled Building (green and red cuboid) and OCU Stack (black cylinder with red top)

Contains part of WDR & RT Taggart drawing number 20001-060, Revision 0.

Sensitive Locations

- 2.8 Odour concentrations have been predicted across nested Cartesian grids. These grids have a spacing of 5 m x 5 m within 400 m of the stack, 25 m x 25 m within 800 m and 50 m x 50 m within 1 km of the stack. The receptor grid has been modelled at a height of 1.5 m above ground level.
- 2.9 Locations sensitive to odours emitted during site operations will be places where members of the public are regularly present. The sensitivity of a location will be dependent on the land use and the amenity in each given location. Guidance on receptor sensitivity is set out in the relevant guidance documents: (IAQM, 2018) and (Environment Agency, 2011).
- 2.10 Fourteen discrete receptor locations have been identified for this assessment which include receptors at the boundary of the NMP facility, as well as the nearest off-site receptor locations. These locations are described in Table 4 and shown in Figure 5.

Table 4: Discrete Receptor Locations

Receptor ID	Description	X, Y	Receptor Sensitivity
1	Site boundary	319196,191314	N/A
2	Site boundary	319215,191368	N/A
3	Site boundary	319256,191386	N/A
4	Site boundary	319283,191374	N/A
5	Site boundary	319272,191312	N/A
6	Site boundary	319252,191228	N/A
7	Site boundary	319176,191244	N/A
8	Site boundary	319217,191235	N/A
9	Industrial facility	319185,191320	Low
10	Industrial facility	319274,191309	Low
11	Residential property	318753,191470	High
12	Residential property	318757,191554	High
13	Residential property	318549,191430	High
14	Residential property	319735,191256	High

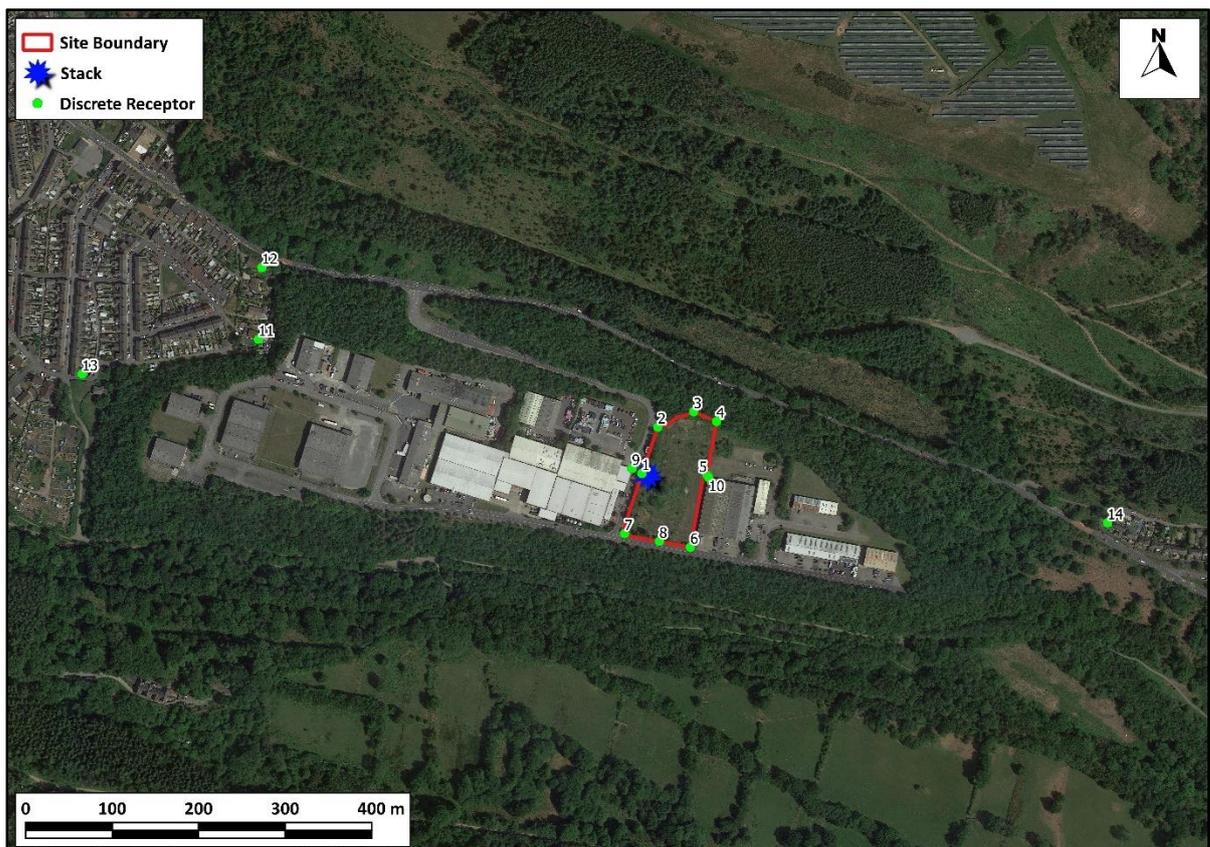


Figure 5: Discrete Receptor Locations

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Model Outputs

- 2.11 The model has been run to predict the 98th percentile of 1-hour odour concentrations across the grid of receptors. The predicted 98th percentiles of 1-hour odour concentrations have been compared to the suggested benchmarks outlined in the IAQM guidance on the assessment of odours for planning (IAQM, 2018) and the Environment Agency’s horizontal guidance note (H4) (which has been adopted by Natural Resources Wales) (Environment Agency, 2011).
- 2.12 The process emissions discharged from the stack will have been treated by the OCU, and thus the offensiveness of the odours is likely to be low; however, the exact character and offensiveness of the odours is not currently known. The H4 guidance states that, for “moderately offensive” odours, “most odours from the processes we regulate fall into this category i.e., any odours which do not obviously fall within the ‘more offensive’ or ‘less offensive’ categories”. Therefore, the odours from the OCU stack have been assumed to be “moderately offensive” when assessing the significance of the impacts.
- 2.13 The H4 guidance sets benchmark levels for odours; the benchmark for “moderately offensive” odours, based on the 98th percentile of hourly average concentrations, is 3 OU_E/m³ at the site boundary.
- 2.14 Furthermore, the IAQM guidance provides descriptors for odour effects for “moderately offensive” odours for various sensitivities of land use. These have been set out in Table 5 below and have been used to determine the overall significance of the odour effects at the surrounding land uses.

Table 5: Odour Effect Descriptors for Impacts Predicted by Modelling – “Moderately Offensive” Odours

Risk of Odour Impact	Receptor Sensitivity		
	Low ^a	Medium ^b	High ^c
≥10	Moderate	Substantial	Substantial
5-<10	Moderate	Moderate	Substantial
3-<5	Slight	Moderate	Moderate
1.5-<3	Negligible	Slight	Moderate
0.5-<1.5	Negligible	Negligible	Slight
<0.5	Negligible	Negligible	Negligible

^a Such as industrial use, footpaths, roads.

^b Such as places of work, retail premises.

^c Such as residential properties, schools, restaurants, hospitals.

3 Odour Impact Assessment

Model Results

- 3.1 The ADMS-5 model has been run to predict 98th percentile 1-hour odour concentrations at each of the discrete receptor locations shown in Figure 5 and described in Table 4. Odour concentrations have also been predicted across a grid of receptor points for ground-level odour contour plots to be produced.
- 3.2 The model has been run for a series of sensitivity tests. These sensitivity tests include running the model for five years of meteorological data, and both with and without the effects of buildings in the model.
- 3.3 A summary of the 98th percentile of 1-hour odour concentrations at each of the sensitive receptor locations for each of the modelled meteorological years is presented in Table 6.

Table 6: Odour Dispersion Modelling Results at Sensitive Receptors ^a

Receptor	Location	Modelled 98th Percentile 1-Hour Odour Concentrations (OU _E /m ³)				
		2016	2017	2018	2019	2020
1	Boundary	0.4	0.5	0.5	0.5	0.6
2	Boundary	0.9	1.2	1.2	1.2	1.4
3	Boundary	0.7	0.8	0.8	0.8	0.8
4	Boundary	0.7	0.7	0.7	0.8	0.8
5	Boundary	0.8	0.9	0.9	1.0	0.9
6	Boundary	0.3	0.4	0.4	0.6	0.4
7	Boundary	0.4	0.3	0.5	0.5	0.4
8	Boundary	0.4	0.3	0.4	0.6	0.4
9	Industrial	2.3	0.8	2.4	0.8	2.4
10	Industrial	0.9	0.9	0.8	1.0	0.9
11	Residential	0.4	0.3	0.4	0.5	0.3
12	Residential	0.4	0.3	0.4	0.4	0.3
13	Residential	0.3	0.2	0.2	0.3	0.2
14	Residential	0.4	0.5	0.4	0.4	0.4

^a Concentrations shown for each meteorological year are the highest predicted concentration from the 'with buildings' and 'without buildings' model scenarios.

- 3.4 The highest predicted odour concentration at any boundary receptor is 1.4 OU_E/m³ at Receptor 2 in 2020, which is below the 3 OU_E/m³ criterion for site boundary concentrations as set out in the H4 guidance (Environment Agency, 2011). This concentration is also below the most stringent H4 odour assessment criterion of 1.5 OU_E/m³. The highest predicted odour concentrations at any offsite industrial and residential receptor is 2.4 OU_E/m³ (at Receptor 9) and 0.5 OU_E/m³ (at Receptors 11

and 14), respectively. These are again below the 3 OU_E/m³ criterion, and also below the most stringent H4 odour assessment criterion of 1.5 OU_E/m³ at the residential receptor locations. It should be noted that the maximum ground level odour concentration occurs beyond the site boundary, which is due to the elevated nature of the odour source (OCU stack at 16 m in height). The significance of these impacts in planning terms is set out in Paragraph 3.6 and Table 7.

3.5 In order to demonstrate the predicted spatial dispersion of odours from the OCU stack, a contour plot of odour concentrations from the worst-case model scenario (using 2016 meteorological data) is shown in Figure 6. This shows that the 98th percentile of 1-hour odour concentrations above the 3 OU_E/m³ criterion affects only a very small area of the land close to the stack (albeit beyond the facility boundary). Contour plots for other modelled meteorological years are presented in Appendix A4, and the significance of these impacts in planning terms is set out in Paragraph 3.6 and Table 7.

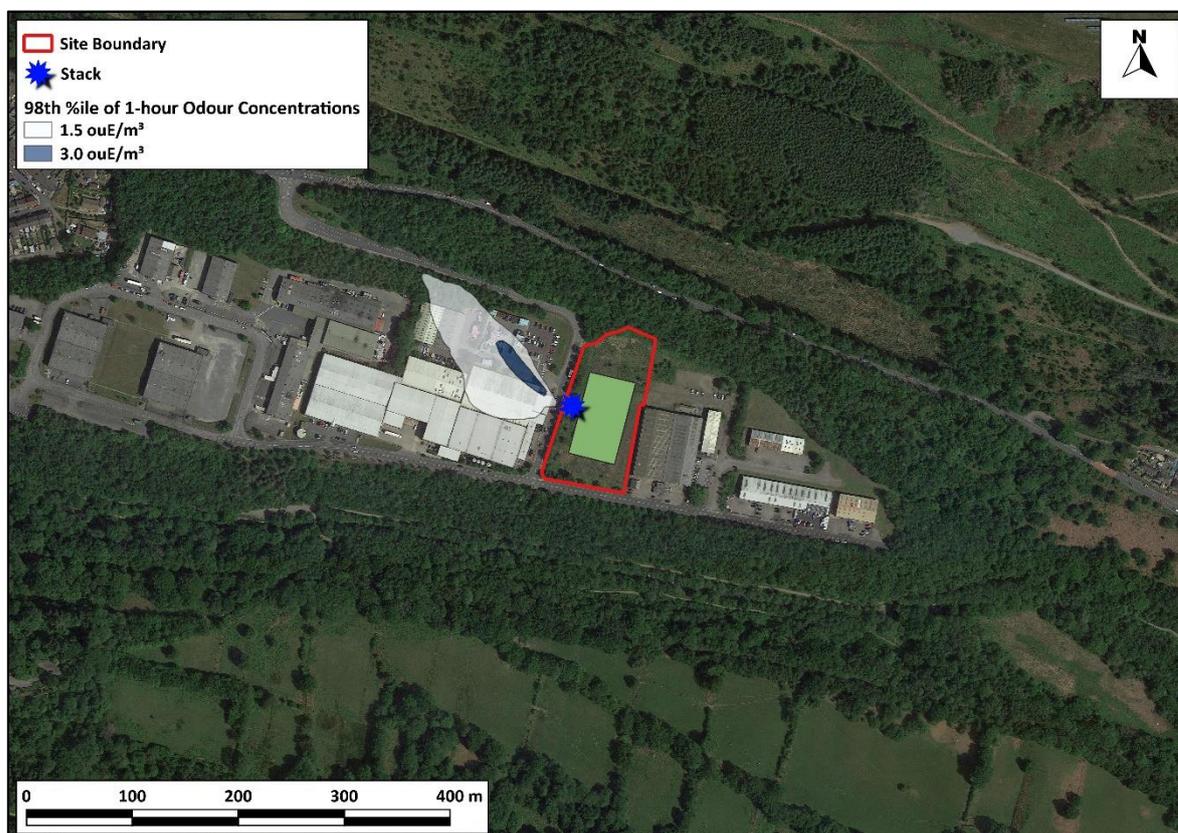


Figure 6: Contour plot of 98th percentile of 1-hour odour concentrations – 2016 Meteorological Data

Imagery ©2021 Google.

Significance of Odour Effects

3.6 The odour effects for the non-boundary discrete receptor locations are shown in Table 7. The significance has been determined using the worst-case results from the modelling (see Table 6) in

conjunction with the matrix set out in Table 5. All effects are *negligible*, and thus the overall impacts of odours from the OCU stack will be 'not significant'.

Table 7: Significance of Odour Effects

Receptor	Location	Receptor Sensitivity	Maximum Modelled 98th Percentile 1-Hour Odour Concentrations (OU _E /m ³)	Effect
9	Industrial	Low	2.4	Negligible
10	Industrial	Low	1.0	Negligible
11	Residential	High	0.5	Negligible
12	Residential	High	0.4	Negligible
13	Residential	High	0.3	Negligible
14	Residential	High	0.5	Negligible

Temperature Inversions

- 3.7 The facility is located within a steep-sided valley (see Figure 3), and the area may thus be subject to temperature inversions. Temperature inversions occur during those occasions when the atmosphere is still and when clear skies allow the air at ground level to cool at night-time. These conditions arise mainly during the autumn and winter months. The inversion can prevent ground-level emissions from mixing up into the atmosphere. In other words, it can trap these emissions near to the ground. Inversions build up from the ground, often only reaching a few metres above ground level, although occasionally they can rise to a few tens of metres.
- 3.8 Temperature inversions cannot be specifically accounted for in the ADMS-5 dispersion model and whilst these events may lead to slower dispersion or more rapid grounding of odour emissions from the OCU stack, it is extremely unlikely that temperature inversion events will significantly affect the model results. The modelling has demonstrated that the largest impacts occur very close to the stack indicating a propensity for rapid plume grounding regardless of temperature inversions. Odour concentrations reduce to below 1.5 OU_E/m³ beyond the boundary of the wider industrial estate and are very low at the nearest residential dwellings with substantial headroom to the odour benchmark of 3 OU_E/m³. In any event, temperature inversion events will be relatively infrequent and the effects of a temperature inversion on odour concentrations at the nearest highly sensitive land uses (i.e., the residential properties to the east and west) will not be significant and will not affect the conclusions of this modelling study.

4 Odour Management and Mitigation

4.1 The assessment has demonstrated that residual odours released from the carbon filter OCU stack will not lead to any significant effects at any nearby sensitive land use. Nevertheless, the facility should employ odour mitigation and management measures to ensure compliance with the Best Available Techniques (BAT) for the minimisation of odour emissions. These have been summarised below:

- the carbon filter OCU should be maintained in accordance with the manufacturer's specification, with the activated carbon media being replaced regularly to ensure consistent, optimal odour abatement;
- the facility should be operated in accordance with an Odour Management Plan which should include a procedure for handling and responding to complaints; and
- non-baled, unprocessed waste should not be stored outside for any period of time.

5 Summary

- 5.1 The effects of odour emissions from a proposed carbon filter OCU stack at the consented materials recycling facility at Nine Mile Point, Caerphilly, have been assessed using dispersion modelling.
- 5.2 The modelling study has demonstrated that the effects of odours from the stack on all nearby, sensitive land uses will be *negligible*. Concentrations of odours will be below both the Environment Agency's (as adopted by NRW) and the IAQM's recommended impacts criteria for '*moderately offensive*' odours.
- 5.3 Overall, it is judged that the odour effects associated with the OCU stack will be '*not significant*' at all nearby sensitive receptor locations, and that concentrations of odours at the site boundary will be below the relevant benchmark set out in the Environment Agency's H4 guidance document (which has been adopted by NRW).

6 References

Environment Agency (2011) *H4 Odour Management. How to comply with your environmental permit.*

HMSO (1990) *Environmental Protection Act 1990.*

IAQM (2018) *Guidance on the assessment of odours for planning v1.1.*

Welsh Government (2015) *Well-being of Future Generations (Wales) Act 2015*, Available: <http://futuregenerations.wales/about-us/future-generations-act/>.

Welsh Government (2021) *Planning Policy Wales Edition 11*, Available: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf.

7 Appendices

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A1 Odour in Legislation, Policy and Guidance

National Legislation

Environmental Protection Act

- A1.1 There are currently no statutory standards in the UK covering the release and subsequent impacts of odours. This is due to complexities involved with measuring and assessing odours against compliance criteria, and the inherently subjective nature of odours.
- A1.2 It is recognised that odours have the potential to pose a nuisance for residents living near to an offensive source of odour. Determination of whether or not an odour constitutes a statutory nuisance in these cases is usually the responsibility of the local planning authority or the Environment Agency. The Environmental Protection Act 1990 (1990) outlines that a local authority can require measures to be taken where any:

“dust, steam, smell or other effluvia arising on an industrial, trade and business premises and being prejudicial to health or a nuisance...” or

“fumes or gases are emitted from premises so as to be prejudicial to health or cause a nuisance..”

- A1.3 Odour can also be controlled under the Statutory Nuisance provisions of Part III of the Environmental Protection Act.

Planning Policy

- A1.4 Land-use planning policy in Wales is established within the policy document Planning Policy Wales (PPW) (Welsh Government, 2021), which provides the strategic policy framework for the effective preparation of local planning authority development plans. With regard to pollution and health effects, it states:

“Planning authorities have a role to play in the prevention of physical and mental illnesses caused, or exacerbated, by pollution, disconnection of people from social activities (which contributes to loneliness) as well as the promotion of travel patterns which facilitate active lifestyles. The planning system must consider the impacts of new development on existing communities and maximise health protection and well-being and safeguard amenity. This will include considering the provision of, and access to, community and health assets, such as community halls, libraries, doctor’s surgeries and hospitals. Health impacts should be minimised in all instances, and particularly where new development could have an adverse impact on health, amenity and well-being. In such circumstances, where health or amenity impacts cannot be overcome satisfactorily, development should be refused”.

“Planning authorities should develop and maintain places that support healthy, active lifestyles across all age and socio-economic groups, recognising that investment in walking and cycling

infrastructure can be an effective preventative measure which reduces financial pressures on public services in the longer term. The way a development is laid out and arranged can influence people's behaviours and decisions and can provide effective mitigation against air and noise pollution. Effective planning can provide calming, tranquil surroundings as well as stimulating and sensory environments, both of these make an important contribution to successful places"

"Green infrastructure can be an effective means of enhancing health and well-being, through linking dwellings, workplaces and community facilities and providing high quality, accessible green spaces. In all development and in public spaces especially, there should be sensitive management of light, and exposure to airborne pollution should be kept as low as reasonably practicable. The compatibility of land uses will be a key factor in addressing air quality and creating appropriate soundscapes which are conducive to, and reflective of, particular social and cultural activities and experiences, particularly in busy central areas of towns and cities. Equally, the provision of quiet, tranquil areas which provide peaceful sanctuaries in otherwise noisy environments can help to reduce general levels of pollution and promote both mental and physical well-being".

- A1.5 PPW places a general presumption in favour of sustainable development, stressing the importance of local development plans, and states that the planning system should perform an environmental role to minimise pollution. Local development plans should enable consideration of the effects that the proposed development may have on air quality, as well as the effect that air quality may have on the proposed development. To prevent unacceptable risks from air pollution, planning decisions should ensure that new development is appropriate for its location.
- A1.6 PPW also places considerable emphasis on the Well-being of Future Generations Act (Welsh Government, 2015) with the intention to improve the social, economic, environmental and cultural well-being of Wales, and outlines how this can be achieved through the concept of 'Placemaking'.
- A1.7 PPW is supported by a series of Technical Advice Notes (TANs) and National Assembly for Wales Circulars. Local planning authorities have to take PPW, TANs and Circulars into account when preparing Development Plans.
- A1.8 With respect to planning policy guidance, TAN 18 on transport (Welsh Government, 2015) makes reference to local air quality and the need for Air Quality Action Plans to be prepared for any Air Quality Management Areas declared.
- A1.9 The need for compliance with any statutory air quality limit values and objectives is stressed, and the presence of AQMAs must be accounted for in terms of the cumulative impacts on air quality from individual sites in local areas. New developments in AQMAs should be consistent with local air quality action plans.

Odour Guidance

Natural Resources Wales Guidance

A1.10 The Environment Agency has produced a horizontal guidance note (H4) (which has been adopted by Natural Resources Wales) on odour assessment and management (Environment Agency, 2011), which is designed for operators of regulated processes (i.e., those which classify as Part A(1) processes under the Pollution Prevention and Control (PPC) regime). The H4 guidance document is primarily aimed at methods to control and manage the release of odours, but also contains a series of recommended assessment methods which can be used to assess potential odour impacts.

Institute of Air Quality Management Guidance

A1.11 The latest UK guidance on odour was published by the Institute of Air Quality Management (IAQM) in 2018 (IAQM, 2018). The IAQM guidance sets out assessment methods which may be utilised in the assessment of odours for planning applications. It is the only UK odour guidance document which contains a method for estimating the significance of potential odour impacts.

A1.12 The IAQM guidance endorses the use of multiple assessment tools for odours, stating that, “*best practice is to use a multi-tool approach where practicable*”. This is in order to improve the robustness of the assessment conclusions. Some of the methods outlined in the IAQM guidance have been adopted in this odour assessment.

A2 Professional Experience

Laurence Caird, MEarthSci CSci MEnvSc MIAQM

Mr Caird is an Associate Director with AQC, with over 15 years' experience in the field of air quality and odour management and assessment. He has carried out air quality and odour assessments for a wide range of residential and commercial developments, airports, industrial processes, road schemes and energy-from-waste installations throughout the UK and abroad. Mr Caird's experience in terms of odour assessment includes odours from poultry farms and other intensive livestock farming, waste water treatment, brewing and distilling, meat processing, sugar refining, various processes using paints and solvents and a large number of commercial kitchens. He has acted as expert witness in relation to the assessment of air quality or odour impacts at a number of previous planning appeals, and is a contributory author to the IAQM's *Guidance on the assessment of odours for planning*.

Paul Outen, BSc (Hons) MEnvSc MIAQM

Mr Outen is a Principal Consultant with AQC, with over eleven years' experience in the assessment of air quality and odours. He undertakes air quality and odour assessments covering residential and commercial developments, industrial installations, road schemes, energy centres and mineral and waste facilities. These involve qualitative assessments, and quantitative modelling assessments using the ADMS dispersion models, for both planning and permitting purposes. He has also presented evidence at public hearings. Mr Outen has a particular interest in odour assessment, and has extensive experience in the assessment of odours across a wide range of industries throughout the UK, Europe and Asia. He also has experience in pollutant monitoring techniques. He regularly undertakes site audits for various installations to advise on pollution control and mitigation strategies. He is a Member of both the Institution of Environmental Sciences and Institute of Air Quality Management.

A3 Wind Roses

A3.1 Wind roses for the meteorological data used in the dispersion model are presented below.

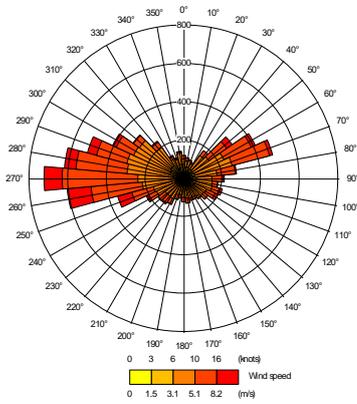


Figure A3.1: Wind Rose from Cardiff Airport Meteorological Station for 2016

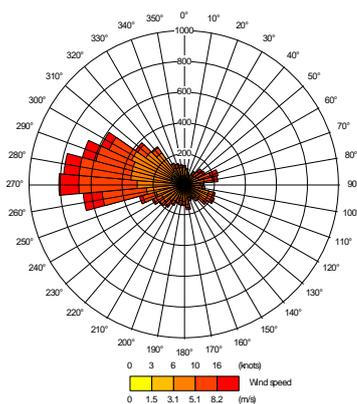


Figure A3.2: Wind Rose from Cardiff Airport Meteorological Station for 2017

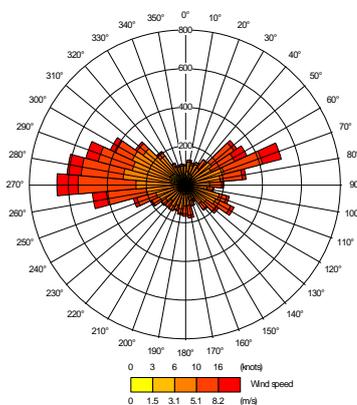


Figure A3.3: Wind Rose from Cardiff Airport Meteorological Station for 2018

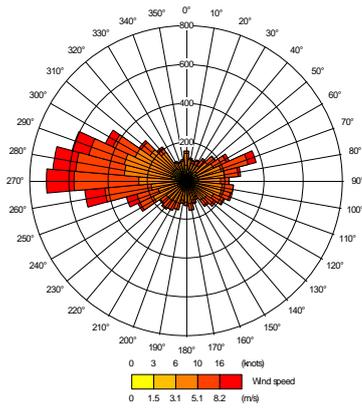


Figure A3.4: Wind Rose from Cardiff Airport Meteorological Station for 2019

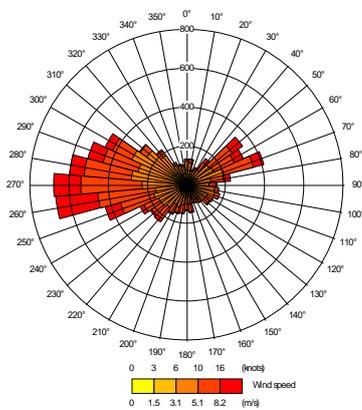


Figure A3.5: Wind Rose from Cardiff Airport Meteorological Station for 2020

A4 Odour Contours

A4.1 If odour contours are produced, present them all here if a number of scenarios/met years have been modelled.



Figure A4.1: Contour plot of 98th percentile of hourly mean odour concentrations, using 2017 meteorological data

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Figure A4.2: Contour plot of 98th percentile of hourly mean odour concentrations, using 2018 meteorological data

Imagery ©2021 Google.



Figure A4.3: Contour plot of 98th percentile of hourly mean odour concentrations, using 2019 meteorological data

Imagery ©2021 Google.



Figure A4.4: Contour plot of 98th percentile of hourly mean odour concentrations, using 2020 meteorological data

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