



# Colomendy Waste Transfer Station

## Odour Risk Assessment

On behalf of **Eunomia Research & Consulting Ltd**



Project Ref: 332511130 | Rev: 0 | Date: June 2022

---

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU  
Office Address: 10 Queen Square, Bristol, BS1 4NT  
T: +44 (0)117 332 7840 E: [airqualityteam@stantec.com](mailto:airqualityteam@stantec.com)

## Document Control Sheet

**Project Name:** Colomendy Waste Transfer Station

**Project Ref:** 332511130

**Report Title:** Odour Risk Assessment

**Doc Ref:** Issued

**Date:** June 2022

	Name	Position	Signature	Date
<b>Prepared by:</b>	Chris Brownlie	Principal Consultant	<i>Chris Brownlie</i>	June 2022
<b>Reviewed by:</b>	Philip Branchflower	Senior Associate – Air Quality	<i>PBr</i>	June 2022
<b>Approved by:</b>	Oliver Belson	Associate	<i>OB</i>	June 2022
<b>For and on behalf of Stantec UK Limited</b>				

Revision	Date	Description	Prepared	Reviewed	Approved
Draft	June 2022	Draft for Client comment	CB	PB	OB

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

## Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	Proposed Development .....	1
1.2	Scope of Assessment.....	1
<b>2</b>	<b>Legislation, Policy and Guidance</b> .....	<b>2</b>
2.1	Planning Policy .....	2
2.2	Environmental Permitting Regulations (EPR) .....	3
2.3	Environmental Protection Act 1990.....	3
2.4	Assessment Guidance.....	3
<b>3</b>	<b>Methodology</b> .....	<b>5</b>
3.2	Source-Pathway-Receptor (S-P-R) Framework .....	5
<b>4</b>	<b>Site Context</b> .....	<b>7</b>
4.1	Site Location.....	7
4.2	Description of Proposed Site Operations.....	7
<b>5</b>	<b>Predicted Impacts</b> .....	<b>8</b>
5.1	Odour Source Potential .....	8
5.2	Pathway Effectiveness .....	8
5.3	Receptor Sensitivity.....	9
5.4	Likely Odour Effect.....	9
<b>6</b>	<b>Summary and Conclusions</b> .....	<b>11</b>
	<b>References</b> .....	<b>12</b>

## Tables

Table 3-1	Risk of Odour Exposure.....	6
Table 3-2	Likely Magnitude of the Effect .....	6
Table 5-1	Pathway Effectiveness between Green Waste Bays and Receptor Locations .....	9
Table 5-2	Pathway Effectiveness between Storage Building and Receptor Locations .....	9
Table 5-3	Receptor Sensitivity.....	9
Table 5-4	Summary of Likely Odour Effects from Proposed Garden Waste Bays.....	9
Table 5-5	Summary of Likely Odour Effects from Proposed Second Storage Building .....	10
Table B-1	Examples of Risk Factors for Odour Source, Pathway and Receptor Sensitivity (IAQM, 2018) 14	

## Appendices

Appendix A	Glossary
Appendix B	IAQM (2018) Guidance S-P-R Framework Approach
Appendix C	Site Location
Appendix D	Internal Site Layout
Appendix E	Windroses from Hawarden Meteorological Station, 2009-2013

This page is intentionally blank

# 1 Introduction

## 1.1 Proposed Development

- 1.1.1 Stantec UK Limited (Stantec) has been commissioned by Eunomia on behalf of WRAP Cymru to undertake an odour assessment to accompany an Environmental Permit (EP) application for the proposed Colomendy Waste Transfer Station (WTS) located approximately 1km north of Denbigh Town. The Site is located within the administrative boundary of Denbighshire County Council (DCC). The location of the Site is shown in **Figure C-1, Appendix C**.
- 1.1.2 This report supports the application for a bespoke waste environmental permit for the Colomendy Waste Transfer Station. Denbighshire County Council have had pre-application advice in relation to the scheme (ref. PPN00393).

## 1.2 Scope of Assessment

- 1.2.1 This report provides an assessment of the potential odour impacts resulting from the Proposed Development on amenity at existing sensitive receptor locations. A qualitative odour assessment has been undertaken to accompany the permit application for the proposed WTS due to the risk of odour causing amenity related impacts resulting at sensitive receptors within the vicinity.
- 1.2.2 The assessment has been prepared considering the requirements of relevant local and national guidance, policy and legislation.

## 2 Legislation, Policy and Guidance

### 2.1 Planning Policy

#### National Planning Policy

##### Planning Policy Wales

2.1.1 Planning Policy Wales (PPW) (Edition 11, February 2021) sets out the land use policies of the Welsh Government (Welsh Government, 2021). It is supplemented by a suite of documents which together provide the national planning policy framework for Wales. The following paragraphs from the PPW are considered relevant to odour and amenity.

2.1.2 Paragraph 2.27 states:

*“Planning authorities should ensure that social, economic and environmental and cultural benefits are considered in the decision-making process...Key factors in the decision making process include: ...*

*Environmental considerations: ...*

- *Are the environmental impacts of development on health and amenity limited to acceptable levels and the resilience of ecosystems improved; ...”*

2.1.3 Paragraph 3.21 states:

*“The planning system must consider the impacts of new developments on existing communities and maximise health protection and well-being and safeguard amenity...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.”*

2.1.4 Paragraph 5.13.1 on Sustainable Waste Management Facilities states:

*“The planning system has an important role to play in facilitating sustainable waste management by providing a framework for decision making which recognises the social economic and environmental benefits that can be realised from the management of waste as a resource to meet the needs of society and businesses, whilst at the same time: ...*

- *Protecting the amenity of residents, of other land uses and users affected by existing or proposed waste management facilities.”*

2.1.5 Paragraph 5.13.2 then states:

*“The benefits which can be derived from proposals for waste management facilities as well as the impact of proposals on the amenity of local people and the natural and built environment must be adequately assessed to determine whether a planning application is acceptable. If adverse impacts on amenity or the environment cannot be mitigated, planning permission should be refused.”*

##### Technical Advice Note 21 (TAN21): Waste

2.1.6 The Technical Advice Note 21 (Welsh Government, 2014) sets out a framework for facilitating delivery of sustainable waste management infrastructure through the planning process. In relation to odour, Paragraph 10.1 states:

*“Waste management facilities can produce odours that can be a cause of concern to sensitive receptors, and this should be given full weight in the consideration of planning applications...”*

- 2.1.7 Paragraph 4.60 relates specifically to waste transfer stations and states:

*The required site and building design measures will depend on the type of transfer station proposed (i.e. inert, hazardous, or clinical waste). However, it will be necessary to ensure these installations are located in suitable areas...Transfer stations can create issues with odour, noise, dust, vermin and visual amenity where storage of waste occurs in the open, as well as high traffic movements associated with delivering and collecting. Therefore, planning issues to consider in relation to these types of development include, but are not limited to: ... mitigation of noise and odour ...”*

## **Local Planning Policy**

- 2.1.8 The DCC Local Development Plan (LDP) was adopted in 2013 and sets out the proposals and policies for future development and land use in Denbighshire until 2021 (DCC, 2013). The LDP contains Policy RD1 Sustainable development and good standard design which states:

*“Development proposals will be supported within development boundaries provided that all the following criteria are met:*

*... vi) Does not unacceptably affect the amenity of local residents, other land and property users or characteristics of the locality by virtue of increased activity, disturbance, noise, fumes, litter, drainage, light pollution etc., and provides satisfactory amenity standards itself;”*

## **2.2 Environmental Permitting Regulations (EPR)**

- 2.2.1 The WTS will require an Environmental Permit from Natural Resources Wales (NRW). In issuing the Permit NRW will consider potential offsite odour impacts and the Permit will include the following Odour Boundary Condition:

*“Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in an approved odour management plan, to prevent or where that is not practicable to minimise the odour.”*

## **2.3 Environmental Protection Act 1990**

- 2.3.1 The Environmental Protection Act 1990 sets out provisions for the regulation of statutory nuisance caused by odours. Section 79 (1)(d) sets out this statutory nuisance as, *“any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance”*.
- 2.3.2 Section 80 requires that, where a complaint of a statutory nuisance is made, a Local Authority must take steps to investigate the complaint and decide whether the odour is prejudicial to health or a nuisance. Odours for consideration include those which cause changes in behaviours, such as avoiding use of the garden, closing windows, making complaints and keeping odour diaries.

## **2.4 Assessment Guidance**

- 2.4.1 The primary guidance documents used in undertaking this assessment are detailed in the section below.

## **IAQM 'Guidance on the Assessment of Odour for Planning'**

- 2.4.2 The Institute of Air Quality Management (IAQM) has undertaken a comprehensive review of how odour should be considered in the planning process and has issued revised guidance on the assessment of odour for planning (version 1.1) in July 2018 (IAQM, 2018). The document provides guidance on the use of a number of odour assessment techniques and the assessment of odour effects.

## **H4 Odour Management**

- 2.4.3 NRW has produced Guidance for H4 Odour Management (NRW, 2014) to assist potential and existing permit holders in understanding how to apply, vary and comply with their permits. The guidance provides information on regulatory requirements under the Environmental Permitting Regulations, advice on odour management and preparing odour management plans.

## 3 Methodology

- 3.1.1 The assessment methodology detailed in the following sections has been applied to ascertain the potential odour impacts of the Proposed Development in order to identify their significance and compliance with policy and regulatory requirements (outlined in **Section 2** of this report), and whether or not additional mitigation is required.
- 3.1.2 An odour risk assessment is required by NRW as part of the permit application. For the assessment of impacts from a future potentially odorous development, the IAQM recommends using predictive tools (i.e. qualitative risk-based assessments or dispersion modelling) to assess the odour effects of a proposed development, as empirical observations will not be available. Therefore, a qualitative risk-based approach, using the Source-Pathway-Receptor (S-P-R) framework, has been undertaken. The S-P-R approach is a standard approach and is detailed in the following section.
- 3.1.3 The IAQM guidance describes an impact as changes to the environment because of a proposed development, for example an increase in odour concentrations. An effect is described as the result of these changes on receptor locations, for example loss of amenity.

### 3.2 Source-Pathway-Receptor (S-P-R) Framework

- 3.2.1 The qualitative risk-based assessment approaches, such as the S-P-R framework, are based on the concept that overall risk depends on the probability of an event occurring (i.e. likelihood of odour exposure), together with the consequences if that event were to occur (i.e. the effect on the receptor if that exposure took place).
- 3.2.2 The 'source odour potential' is first defined taking into account three factors:
- The magnitude of the release from the odour source, taking into consideration any odour control measures already in place.
  - How inherently odorous the compounds are.
  - The relative pleasantness or unpleasantness of the odour. The NRW H4 guidance (NRW, 2014) provides a list of relative pleasantness of different substances.
- 3.2.3 The 'pathway effectiveness' is then estimated. The odour concentration at a receptor can be reduced by factors affecting the dilution and dispersion of the odorous pollutant plume. Key factors include:
- Distance between the source and sensitive receptors.
  - The prevailing wind direction and whether receptors are located downwind. When conditions are calm, resulting in minimal dilution and dispersion, receptors close to the source in all directions are at risk of odour impacts. However, when conditions are not calm, receptors downwind of the prevailing wind direction tend to be associated with higher risk of odour impacts.
  - The release point and whether it promotes good dispersion (i.e. a higher stack will tend to promote better dispersion and therefore reduce the effectiveness of the pathway between the source and receptor).
  - The presence of topographical features such as hills and valleys. Topographical features can increase or reduce dispersion and dilution between the source and the receptor.

- 3.2.4 Finally, the receptor sensitivity is determined based upon the land uses present, the duration users are likely to be present at the receptor location, and the level of amenity users would reasonably expect to enjoy.
- 3.2.5 **Table B-1, Appendix B** (based on Table 9, Appendix 1 of the IAQM guidance) outlines the S-P-R assessment framework for the qualitative odour assessment and provides criteria to assist in defining the odour source potential, pathway effectiveness and receptor sensitivity.
- 3.2.6 Depending upon the odour source potential and pathway effectiveness, the risk of odour exposure (impact) is defined (Table 10 of the IAQM guidance), as per **Table 3-1**.

Table 3-1 Risk of Odour Exposure

Pathway Effectiveness	Odour Source Potential		
	Small	Medium	Large
Highly Effective	Low Risk	Medium Risk	High Risk
Moderately Effective	Negligible Risk	Low Risk	Medium Risk
Ineffective	Negligible Risk	Negligible Risk	Low Risk

- 3.2.7 The estimate of odour impact is then combined with the receptor sensitivity to indicate the likely magnitude of the effect (Table 11 of the IAQM guidance), as indicated in **Table 3-2**.

Table 3-2 Likely Magnitude of the Effect

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight Adverse	Moderate Adverse	Substantial Adverse
Medium	Negligible	Slight Adverse	Moderate Adverse
Small	Negligible	Negligible	Slight Adverse
Negligible	Negligible	Negligible	Negligible

- 3.2.8 The S-P-R approach results in a prediction of the likely odour effect at each sensitive receptor. To estimate the overall odour effect on the surrounding area, the different magnitude of effects at individual receptors, and the number of receptors expected to experience these different effects, must be taken into account using professional judgement.
- 3.2.9 The guidance states that where the determined overall odour effect is greater than 'slight adverse', the overall effect on amenity could be regarded as significant. Where an odour effect is significant, this does not mean that the development proposal is unacceptable, rather that careful consideration is required taking into account the consequences, scope for securing further mitigation and the balance of wider benefits that the proposal would provide.

## 4 Site Context

### 4.1 Site Location

- 4.1.1 **Figure C-1, Appendix C** shows the location of the Site. The Site is in the northern part of the Colomendy Industrial Estate, Denbigh and currently comprises open farmland.
- 4.1.2 To the north of the Site is further farmland and to the east is farmland identified as sites for commercial development. To the south of the Site is the existing Colomendy Industrial Estate which comprises a range of different commercial business uses. To the west of the Site is Fford y Graig with woodland and the Graig Quarry beyond.

### 4.2 Description of Proposed Site Operations

- 4.2.1 The facility will receive, store, process and bulk a range of primarily pre-sorted materials to include mixed recyclables, materials (including glass, plastic and cans), residual and Absorbent Hygiene Products (AHPs) waste and organic material (including garden waste, household food waste, wood, paper and card). The WTS will process up to 76,000 tonnes per annum. The layout of the Site is shown in **Figure D-1, Appendix D**.
- 4.2.2 The principal elements of the proposals include a new main storage building which will house the main elements of the WTS including two balers and mechanical and manual sort lines.

## 5 Predicted Impacts

### 5.1 Odour Source Potential

5.1.1 The following waste streams to be delivered to the Site are inherently odorous:

- Household and trade food waste.
- AHPs.
- Green waste.
- Residual waste.

5.1.2 The remaining waste streams are generally not considered to be inherently odorous and are therefore not considered further in this assessment.

5.1.3 Food waste will largely be putrescible in nature and therefore potentially highly odorous. The unpleasantness of the odour will depend upon the contents of the food waste, presence of anaerobic conditions and the degree of decomposition. Household and commercial food waste will be delivered to the Site in stillage RCVs. The household food waste will be collected in dedicated food pods which will be removed from the RCVs and tipped directly into closed artic containers within the designated bay within the depot building. The food waste skips will be closed when they are not in use and therefore odour releases are likely to be limited to occasions when waste is being transferred into the skips. Food waste skips will generally remain on-site for 24 hours. Tipping areas will be swept and washed down as required to leave a tidy working area at the end of the working day.

5.1.4 AHP waste will be collected in bags and deposited into the designated bay within the depot building (see **Appendix D**). AHP waste will not be treated on-site and will remain within the bags. The bay itself is within the depot building so the potential for odour releases is limited. AHP waste will typically remain on-site for a maximum of seven days in exceptional circumstances.

5.1.5 The estimated tonnage the WTS is expected to process approximately 5,000 tonnes per year of green waste which will generally be kept on-site for up to three days. Green waste has the potential to be odorous once decomposition occurs. Green waste will be deposited in an external covered bay (see **Appendix D**).

5.1.6 The estimated tonnage the WTS is expected to process is 17,000 tonnes per annum of residual 'black bag' waste which will be deposited in the depot building (see **Appendix D**). Due to the heterogenous nature of this type of waste, residual waste has the potential to be contaminated with putrescible waste materials. Furthermore, residual waste will not be treated on-site and will remain within the bags so the potential for odour releases is limited.

5.1.7 Considering the above, the depot building which will house the food waste containers, the AHP and residual waste bays, is considered to represent a 'medium odour source potential'. The green waste bay is also considered to represent a 'medium odour source potential'.

### 5.2 Pathway Effectiveness

5.2.1 The pathway effectiveness has been considered in terms of the distance of the sensitive receptors from the Site and the frequency and speed of winds from the direction of the Site. Wind frequency and speed has been obtained from the 2009 – 2013 wind-roses from Hawarden meteorological station (see **Appendix E**), which is considered representative of metrological

conditions at the Site. The effectiveness of the pathway between Site and each receptor location has then been ascertained using the criteria in **Table B-1, Appendix B** and professional judgement.

Table 5-1 Pathway Effectiveness between Green Waste Bays and Receptor Locations

Receptor	Distance from Green Waste Bays (m)	Relevant Wind Direction (°)	Frequency of relevant wind directions (%)	Pathway Effectiveness
R01	222	110-150	3.6%	Ineffective
R02	464	220-260	6.1%	Ineffective
R03	595	250-290	4.8%	Ineffective
R04	612	250-290	4.8%	Ineffective
R05	93	300-360	4.3%	Ineffective
R06	159	300-350	4.2%	Ineffective

Table 5-2 Pathway Effectiveness between Storage Building and Receptor Locations

Receptor	Distance from Storage Building	Relevant Wind Direction (°)	Frequency of relevant wind directions (%)	Pathway Effectiveness
R01	265	110-150	3.6%	Ineffective
R02	393	220-260	6.1%	Ineffective
R03	520	250-290	4.8%	Ineffective
R04	543	250-290	4.8%	Ineffective
R05	75	300-360	4.3%	Ineffective
R06	125	300-350	4.2%	Ineffective

### 5.3 Receptor Sensitivity

5.3.1 The sensitivity of each individual receptor location has been determined using the criteria in **Table B-1, Appendix B** and professional judgement. **Table 5-3** presents the sensitivity at each receptor location.

Table 5-3 Receptor Sensitivity

Receptor	Description	Type	Receptor Sensitivity
R01	Residential property along Ffordd Y Craig	Residential	High
R02	Residential property west of A525	Residential	High
R03	Residential property east of A525	Residential	High
R04	Residential property on A525 roundabout	Residential	High
R05	For Farmers	Industrial	Low
R06	Denbigh Ambulance Station	Commercial	Medium

### 5.4 Likely Odour Effect

5.4.1 The likely odour effect has been determined based on **Table 3-2**, considering receptor sensitivity and odour exposure. **Table 5-4 – Table 5-5** present the results of the assessment of likely odour effects of the odour sources at the Site on sensitive receptor locations.

Table 5-4 Summary of Likely Odour Effects from Proposed Garden Waste Bays

Receptor	Source Odour Potential	Pathway Effectiveness	Odour Exposure	Receptor Sensitivity	Likely Odour Effect
R01	Medium	Ineffective	Negligible Risk	High	Negligible
R02	Medium	Ineffective	Negligible Risk	High	Negligible
R03	Medium	Ineffective	Negligible Risk	High	Negligible
R04	Medium	Ineffective	Negligible Risk	High	Negligible
R05	Medium	Ineffective	Negligible Risk	Low	Negligible
R06	Medium	Ineffective	Negligible Risk	Low	Negligible

Table 5-5 Summary of Likely Odour Effects from Proposed Second Storage Building

Receptor	Source Odour Potential	Pathway Effectiveness	Odour Exposure	Receptor Sensitivity	Likely Odour Effect
R01	Medium	Ineffective	Negligible Risk	High	Negligible
R02	Medium	Ineffective	Negligible Risk	High	Negligible
R03	Medium	Ineffective	Negligible Risk	High	Negligible
R04	Medium	Ineffective	Negligible Risk	High	Negligible
R05	Medium	Ineffective	Negligible Risk	Low	Negligible
R06	Medium	Ineffective	Negligible Risk	Low	Negligible

- 5.4.2 **Table 5-4 – Table 5-5** show that a negligible odour effect is likely to occur at all sensitive receptor locations in proximity to the proposed odour sources. In accordance with the IAQM guidance, the overall effect of the proposed WTS on amenity at sensitive receptor locations is 'not significant'.
- 5.4.3 However, the WTS will be operated to ensure that operational procedures minimise odour generation through the implementation of an Odour Management Plan.

## 6 Summary and Conclusions

- 6.1.1 A qualitative predictive assessment of the odour effects from the proposed Waste Transfer Station at Colomendy Industrial Estate have been assessed. The assessment has been carried out in accordance with IAQM 2018 guidance (IAQM, 2018).
- 6.1.2 There is potential for odour impacts at sensitive receptor locations in proximity to the Proposed Development. However, the assessment has demonstrated that likely odour effects at receptor locations are negligible. Therefore, in accordance with the IAQM guidance, the overall effect of the Proposed Development on amenity at sensitive receptor locations is 'not significant'.
- 6.1.3 However, the WTS will be operated to ensure that operational procedures minimise odour generation through the implementation of an Odour Management Plan.
- 6.1.4 The Proposed Development is therefore considered to be in accordance with the requirements of the PPW, and relevant local and national planning policy and guidance regarding odour.

## References

Denbighshire County Council (2013). 'Local Development Plan 2006 – 2021'. Adopted 4<sup>th</sup> June 2013

Institute of Air Quality Management (2018). '*Guidance on the assessment of odour for planning*'. Available at: <http://iaqm.co.uk/guidance/>

Ministry of Housing, Communities & Local Government (2019). '*National Planning Policy Framework*'. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Natural Resources Wales (2014). '*Additional Guidance for: H4 Odour Management*'.

The Environmental Protection Act 1990.

Welsh Government (2014). '*Technical Advice Notes (TAN) 21: Waste*'

Welsh Government (2021). '*Planning Policy Wales*'.

## Appendix A Glossary

<b>Abbreviations</b>	<b>Meaning</b>
DCC	Denbighshire County Council
DEFRA	Department for Environment, Food and Rural Affairs
IAQM	Institute of Air Quality Management
LA	Local Authority
NRW	Natural Resources Wales
ODT	Odour Detection Threshold
OMP	Odour Management Plan
Receptor	A location where the effects of pollution may occur
S-P-R	Source Pathway Receptor
WTS	Waste Transfer Station

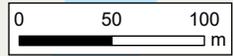
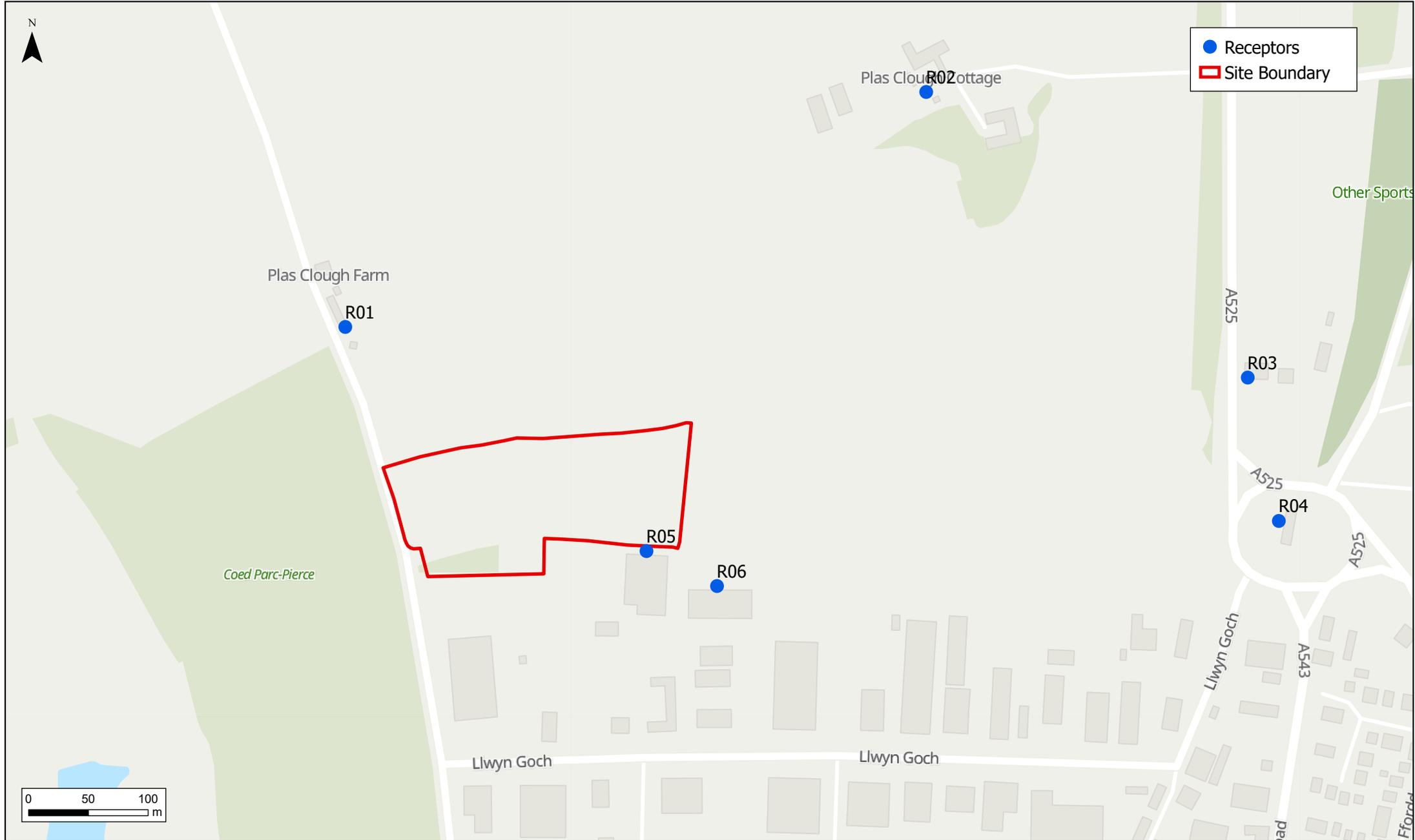
## Appendix B IAQM (2018) Guidance S-P-R Framework Approach

Table B-1 Examples of Risk Factors for Odour Source, Pathway and Receptor Sensitivity (IAQM, 2018)

Odour Source Potential	Pathway Effectiveness	Receptor
<p>Factors affecting the source odour potential include:</p> <ul style="list-style-type: none"> <li>the magnitude of the odour release (taking into account odour control measures);</li> <li>how inherently odorous the compounds are;</li> <li>the unpleasantness of the odour.</li> </ul>	<p>Factors affecting the odour flux to the receptor are:</p> <ul style="list-style-type: none"> <li>distance from source to receptor;</li> <li>the frequency (or, qualitatively, the direction of receptors from source with respect to prevailing wind);</li> <li>the effectiveness of any mitigation/control in reducing flux to the receptor;</li> <li>topography and terrain.</li> </ul>	<p>For sensitivity of people to odour, the IAQM recommend that the air quality practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the following principles:</p>
<p><b>Large Source Potential</b></p> <p><u>Magnitude</u> – Larger Permitted processes of odorous nature or large STWs; material usage hundreds of thousands of tonnes/m<sup>3</sup> per year; area sources of thousands of m<sup>2</sup>. The compounds involved are very odorous (e.g. mercaptans), having very low Odour Detection Thresholds (ODTs) where known.</p> <p><u>Unpleasantness</u> – processes classed as “Most offensive” in Table 5; or (where known) compounds/odours having unpleasant (-2) to very unpleasant (-4) hedonic score.</p> <p><u>Mitigation/control</u> – open air operation with no containment, reliance solely on good management techniques and best practice.</p>	<p><b>Highly Effective Pathway for Odour Flux to Receptor</b></p> <p><u>Distance</u> – receptor is adjacent to the source/site; distance well below any official set-back distances.</p> <p><u>Direction</u> – high frequency (%) of winds from source to receptor (or, qualitatively, receptors downwind of source with respect to prevailing wind).</p> <p><u>Effectiveness of dispersion/dilution</u> – open processes with low-level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes.</p>	<p><b>High Sensitivity Receptor</b></p> <p>- surrounding land where:</p> <ul style="list-style-type: none"> <li>users can reasonably expect enjoyment of a high level of amenity; and</li> <li>the people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.</li> </ul> <p>Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.</p>
<p><b>Medium Source Potential</b></p> <p><u>Magnitude</u> – smaller Permitted processes or small STWs; material usage thousands of tonnes/m<sup>3</sup> per year; area sources of hundreds of m<sup>2</sup>. The compounds involved are moderately odorous.</p>	<p><b>Moderately Effective Pathway for Odour Flux to Receptor</b></p> <p><u>Distance</u> – receptor is local to the source.</p> <p>Where mitigation relies on dispersion/dilution – releases are elevated but compromised by building effects.</p>	<p><b>Medium Sensitivity Receptor</b></p> <p>- surrounding land where:</p> <ul style="list-style-type: none"> <li>users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or</li> </ul>

<p><u>Unpleasantness</u> – processes classed in H4 as “Moderately offensive”; or (where known) compounds/odours having neutral (0) to unpleasant (-2) hedonic score.</p> <p><u>Mitigation/control</u> – some mitigation measures in place, but significant residual odour remains.</p>		<ul style="list-style-type: none"> <li>people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.</li> </ul> <p>Examples may include places of work, commercial/retail premises and playing/recreation fields.</p>
<p><b>Small Source Potential</b></p> <p><u>Magnitude</u> – falls below Part B threshold; material usage hundreds of tonnes/m<sup>3</sup> per year; area sources of tens of m<sup>2</sup>. The compounds involved are only mildly odorous, having relatively high ODTs where known.</p> <p><u>Unpleasantness</u> – processes classed in H4 as “Moderately offensive”; or (where known) compounds/odours having neutral (0) to unpleasant (-2) hedonic score.</p> <p><u>Mitigation/control</u> – effective, tangible mitigation measures in place (e.g. BAT, BPM) leading to little or no residual odour.</p>	<p><b>Ineffective Effective Pathway for Odour Flux to Receptor</b></p> <p><u>Distance</u> – receptor is remote from the source; distance exceeds any official set-back distance</p> <p>Direction – low frequency (%) of winds from source to receptor (or, qualitatively, receptors upwind of source with respect to prevailing wind).</p> <p>Where mitigation relies on dispersion/dilution – releases are from high level (e.g. stacks, or roof vents &gt;3m above ridge height) and are not compromised by surrounding buildings.</p>	<p><b>Low Sensitivity Receptor</b></p> <p>- surrounding land where:</p> <ul style="list-style-type: none"> <li>the enjoyment of amenity would not reasonably be expected; or</li> <li>there is transient exposure, where people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of the use of the land.</li> </ul> <p>Examples may include industrial, farms, footpaths and roads.</p>

## **Appendix C      Site Boundary and Receptor Locations**



Client



### Colomendy Waste Transfer Station

Figure C-1 Site Boundary and Receptor Locations

GB Topographic: Contains OS data © Crown Copyright and database right 2020  
Contains data from OS Zoomstack

1:4,074 @ A4

Date: 26/05/2022

Drawn: cbrownlie

Checked: PB

Figure C-1

Rev A

## **Appendix D Internal Site Layout**



## Appendix E Windroses from Hawarden Meteorological Station, 2009-2013

Figure E-1 Windrose from Hawarden Meteorological Station, 2009

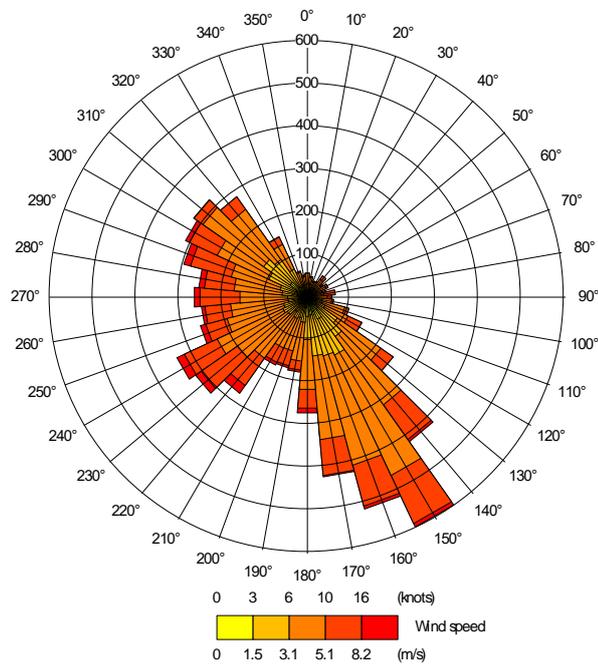


Figure E-2 Windrose from Hawarden Meteorological Station, 2010

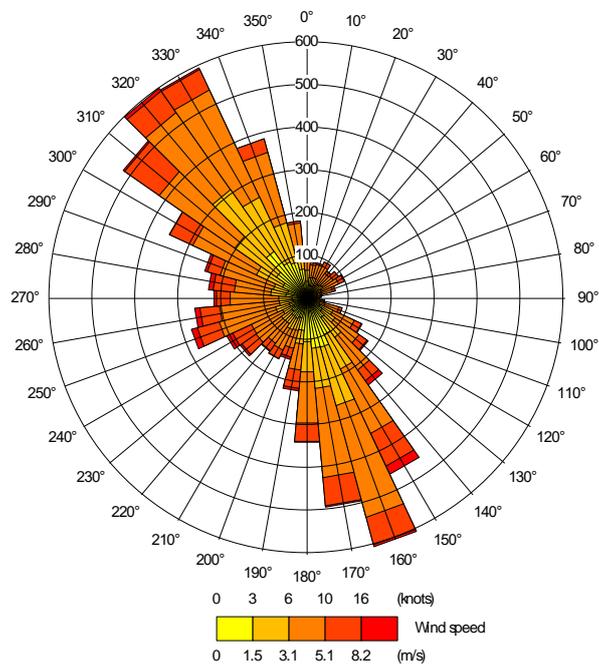


Figure E-3 Windrose from Hawarden Meteorological Station, 2011

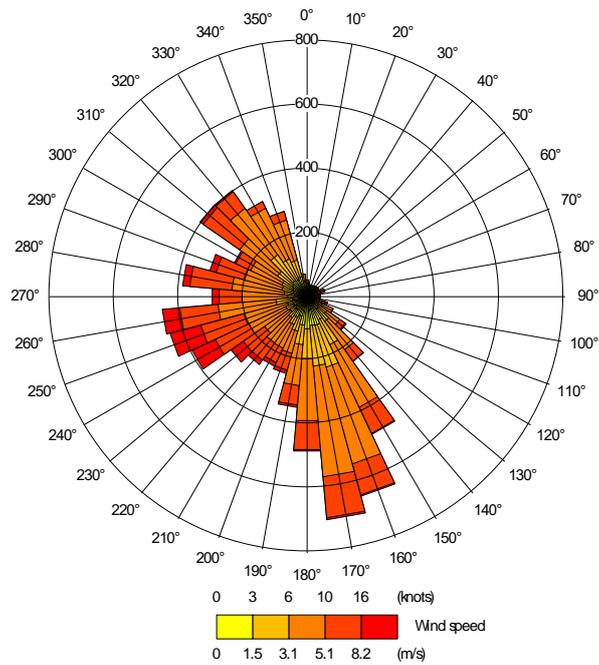


Figure E-4 Windrose from Hawarden Meteorological Station, 2012

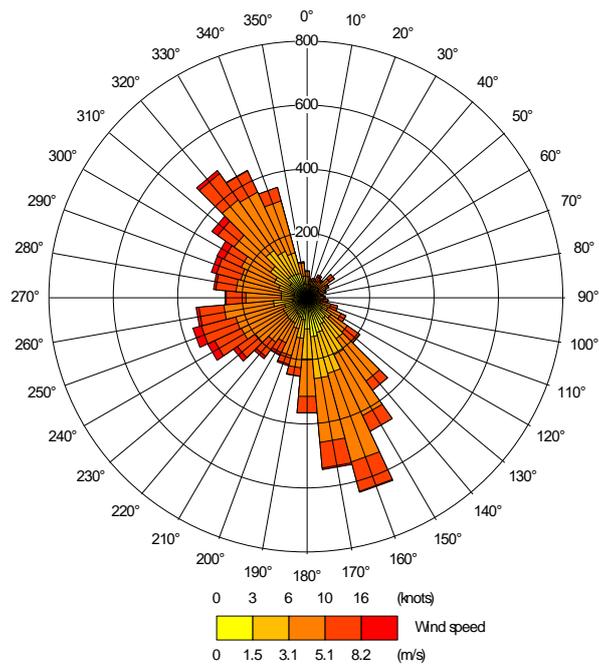


Figure E-5 Windrose from Hawarden Meteorological Station, 2013

