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ALTILIUM METALS

UNIT 2 PLYMBRIDGE HOUSE

AIR QUALITY ASSESSMENT

MAY 2025

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ALTILIUM METALS

UNIT 2 PLYMBRIDGE HOUSE

AIR QUALITY ASSESSMENT

MAY 2025

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APPENDICES

DRAWINGS	**TITLE**	**SCALE**
ST21678-001	ESR and Eco Receptor Locations	1:50,000

EXECUTIVE SUMMARY

An air quality assessment has been undertaken to accompany an Environmental Permit application for the installation of three exhaust stacks at the Altilium Metals site in Plymouth. The assessment has been undertaken to consider the potential air quality effects associated with the operation of the two of the three stacks (the acid leaching stack and the solvent extraction stack), with potential effects considered at a number of existing sensitive human and ecological receptors.

Concentrations of Sulphuric Acid and Hydrogen Fluoride (HF) have been predicted at the closest residential properties to the site, as well as at relevant statutory designated habitat sites. The proposed furnace stack has not been considered within the assessment as this will not emit concentrations of the pollutants of concern mentioned above.

The assessment shows that, with the stacks in place, pollutant concentrations will be below the relevant air quality objectives/Environmental Assessment Levels (EALs) at all existing human receptors assessed. The overall air quality effects associated with the stacks are not therefore considered to be significant for human receptors.

In addition, significant pollutant contributions can be screened out at all existing ecological receptor points considered in the assessment, aside from the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site).

A robust methodology has been adopted within the assessment which assumes the emissions from the stacks are emitted continuously. Even under such a robust methodology, significant pollutant contributions can be screened out at all habitat sites considered within the assessment with the exception of the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site).

It is recommended that further consideration be given to this result by seeking further advice from an ecologist to determine the significance of the predicted pollutant concentrations within this habitat site.

1 INTRODUCTION

1.1 Background

1.1.1 This report details an assessment undertaken to consider the potential significance of emissions associated with two of the three proposed exhaust stacks at the Altilium Metals site in Plymouth. The assessment has considered emissions from the proposed acid leaching stack and the proposed solvent extraction stack.

1.1.2 The assessment has been undertaken using the AERMOD atmospheric dispersion model. Emissions of Sulphuric Acid and Hydrogen Fluoride (HF)associated with the exhaust stacks at the Unit 2 Plymbridge House site have been modelled at a number of representative existing sensitive receptor points. These represent both human receptors (i.e. residential dwellings) and ecological receptor points (i.e. statutory designated habitat sites). The proposed furnace stack has not been considered within the assessment as this will not emit concentrations of the pollutants of concern mentioned above

1.1.3 Predicted pollutant concentrations have been assessed against the relevant air quality objectives, and relevant critical levels and critical loads, to determine the risk of exceedance or potential for impact. Based on this, a conclusion has been reached on whether the emissions from the exhaust stacks are considered to be significant.

1.1.4 A H1 screening assessment has already been undertaken for the stacks, and the majority of pollutants to be emitted have passed the screening test (Benzene, Ammonia, Particulate Matter (PM2.5 and PM10), N-hexane, Carbon monoxide, Nickel and Sulphur dioxide), and therefore do not need further assessment.

1.2 Site Description

1.2.1 The site is located within the Estover Industrial Estate in Plymouth in a largely commercial/urbanised area. The site location is shown on drawing ST21678-001.

1.2.2 There are a number of statutory designated habitat sites in the local area which are relevant to the assessment. Within a 2km radius of the site are the Plymbridge Lane & Estover Road Site of Special Scientific Interest (SSSI), the Forder Valley Local Nature Reserve (LNR), the Bircham Valley LNR and the Seaton and Lower Bircham LNR.

1.2.3 Additionally, within a 10km radius of the site are the Tamar Estuaries Special Protection Area (SPA), the South Dartmoor Woods Special Area of Conservation (SAC), the Dartmoor SAC and the Plymouth Sound & Estuaries SAC.

2 LEGISLATION AND POLICY CONTEXT

2.1 Relevant Air Quality Legislation and Guidance

2.1.1 The air quality assessment has been undertaken in accordance with the following legislation and guidance:

- EU Ambient Air Quality Directive 2008/50/EC (i.e. the CAFE Directive);
- The Environment Act 1995, as amended 2021;
- Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, August 2023
- The Air Quality Standards Regulations 2010;
- Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(22), August 2022;
- Environment Agency, Air Emissions Risk Assessment for Your Environmental Permit, January 2025;
- Environment Agency, Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air, March 2014; and
- Conservation Agencies' Guidance on Evaluating Model Impacts Against Critical Loads.

2.1.2 Further details of these documents are included in **Appendix A**.

2.2 Assessment Criteria

Existing Sensitive Human Receptors

2.2.1 The relevant air quality objectives used in the assessment of air quality effects at existing sensitive human receptors, are included within Table 1.

Table 1: Air Quality Objectives Relevant to the Assessment[a]

Pollutant	Objective/Limit Value	Averaging Period	Source
Sulphuric Acid	300 µg/m^3	1-hour mean	Old EAL derivation method from EH40/2001 OEL
	10µg/m^3	Annual mean	

Table 1: Air Quality Objectives Relevant to the Assessment[a]			
Pollutant	**Objective/Limit Value**	**Averaging Period**	**Source**
Hydrogen Fluoride (HF)	160µg/m^3	1-hour mean	EPAQS Halogen and Hydrogen Halides (2006)
	16µg/m^3	Monthly mean	EPAQS Addendum to Halogens and Hydrogen Halides Report (2009)
[a] *Environmental Assessment Levels taken from the EA emissions risk assessment permitting guidance.*			

Existing Sensitive Ecological Receptor Points

2.2.2 Modelled airborne pollutant concentrations, at locations within the relevant statutory designated habitat sites, have been assessed against critical levels.

2.2.3 The relevant critical levels used in the assessment of air quality effects, associated with airborne pollutant concentrations, at existing sensitive ecological receptor points, are included within Table 2.

Table 2: Critical Levels Relevant to the Assessment[a]		
Pollutant	**Objective/Limit Value**	**Averaging Period**
Hydrogen Fluoride (HF)	5µg/m^3	Daily hour mean
	0.5µg/m^3	Weekly mean
[a] *In accordance with EA guidance*		

2.2.4 Environment Agency (EA) guidance[1] states that emissions can be considered not significant, for SPAs/SACs and SSSIs, where the following criteria apply:

- The short-term Process Contribution (PC) is less than 10% of the short-term environmental standard for protected conservation areas; and
- The long-term PC is less than 1% of the long-term environmental standard for

[1] Environment Agency, Air emissions risk assessment for your environmental permit, March 2023 [Accessed at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit]

protected conservation areas.

2.2.5 Where these requirements aren't met, the Predicted Environmental Concentration (PEC) should be calculated for long-term concentrations only and should be compared against the above criteria. If the long-term PC is greater than 1%, but the PEC is less than 70% of the long-term environmental standard, the emissions are considered not significant.

2.2.6 For local nature sites (such as LNRs), emissions can be considered insignificant where both of the following criteria apply:

- The short-term PC is less than 100% of the short-term environmental standard; and
- The long-term PC is less than 100% of the long-term environmental standard.

2.2.7 Should these criteria be exceeded, it does not necessarily follow that there will be a consequent significant ecological effect; rather it indicates the potential for such an effect to occur.

2.2.8 Should these criteria be exceeded, it does not necessarily follow that there will be a consequent significant ecological effect; rather it indicates the potential for such an effect to occur.

2.2.9 Further discussion of the PC and PEC are provided in section 3.2 of this report.

3 ASSESSMENT METHODOLOGY

3.1 Atmospheric Dispersion Modelling

3.1.1 Potential emissions to atmosphere have been modelled using AERMOD (Lakes Environmental). This is a proprietary quantitative atmospheric dispersion model that is based upon the Gaussian theory of plume dispersion.

3.1.2 The model uses all input data, including the characteristics of the release (e.g. rate, temperature, velocity, height, location, etc.), the terrain, meteorological data and the locations of the buildings adjacent to the proposed emission points, to predict the concentration of the substance of interest at a specified point.

3.1.3 The model uses sequential hourly meteorological data, and the locations of the buildings, to predict the concentration of each substance at each point for each hour over the course of a year. This allows the long-term mean and short-term peak ground level concentrations to be estimated over the modelled area as required.

3.1.4 The dispersion modelling has been carried out in accordance with the EA guidance on carrying out risk assessments for environmental permits.

3.2 Prediction of Pollutant Concentrations

3.2.1 The assessment has considered the following pollutants from two sources in total (e.g. two of the three proposed exhaust stacks):

- Sulphuric Acid concentrations (in micrograms per cubic metre, $\mu g/m^3$); and
- HF concentrations (in milligrams per cubic metre, mg/m^3).

3.2.2 The AERMOD model produces computed concentrations which are known as the Process Contribution (PC). This represents the emissions from the process being modelled.

3.2.3 For human receptors, the PC is added to the relevant ambient background concentration to provide a total Predicted Environmental Concentration (PEC) at the existing receptors assessed. The PC and PEC values are then compared with the relevant air quality objectives (as detailed in Table 1) and the likelihood of exceedance is determined.

3.2.4 For ecological receptor points, in the first instance, the PC is compared to the relevant critical levels (as detailed in Table 2). Where exceedance of the relevant screening criteria is predicted, the PC values can be added to the relevant ambient background concentrations and/or deposition rates for further comparison.

3.2.5 Further details of the modelling methodology are provided in **Appendix B**.

3.3 Existing Sensitive Human Receptors

3.3.1 A number of existing sensitive human receptors (referred to as ESR 1 to ESR 7) have been selected for consideration in the air quality assessment. These have been chosen based on their sensitivity and their proximity to the exhaust stacks.

3.3.2 Details of these receptors are provided in Table 3, and their locations are shown on drawing ST21678-001.

Table 3: Existing Sensitive Human Receptors Considered in Air Quality Assessment

Receptor	Address	Location	
		Easting	Northing
ESR 1	Plymbrdge Road, Plymouth	250830	60191
ESR 2	Laurel Drive, Plymouth	251076	60437
ESR 3	Earls Wood Drive, Plymouth	251893	59234
ESR 4	Wentwood Gardens, Plymouth	251242	59484
ESR 5	Rothbury Close, Plymouth	251087	59636
ESR 6	Long Down Gardens, Plymouth	251341	59265
ESR 7	Forget Me Not Lane, Plymouth	251748	60205

3.3.3 In addition to selected existing sensitive receptors, a uniform Cartesian grid has also been modelled. The parameters of the modelled Cartesian grid are included in Table 4.

Table 4: Uniform Cartesian Grid Parameters (UCART2)

Parameter	X	Y
South West Grid Coordinates	250345.32	58376.37
Number of Points	80	105
Spacing (m)	20	20
Length (m)	1,580	2,080

Table 4: Uniform Cartesian Grid Parameters (UCART2)		
Parameter	**X**	**Y**
Total Number of Grid Receptors	8400	

3.4 Existing Sensitive Ecological Receptor Points

3.4.1 The EA guidance on carrying out risk assessments for environmental permits advises that the following screening distances apply to statutory designated habitat sites (referred to in the guidance as 'protected conservation areas'):

- 10km from a site: Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites; and
- 2km from a site: Sites of Special Scientific Interest (SSSIs) and local nature sites (Ancient Woodland, Local Wildlife Sites (LWSs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)).

3.4.2 A review of the MAGIC online resource[2] indicates that there are four relevant sites located within 2km of the site:

- Plymbridge Lane & Estover Road SSSI
- Forder valley LNR
- Bircham Valley LNR
- Seaton and Lower Bircham LNR

3.4.3 There are also four relevant sites located within a 10km radius:

- Tamar Estuaries Complex SPA
- South Dartmoor Woods SAC
- Dartmoor SAC
- Plymouth Sound & Estuaries SAC

3.4.4 With regard to all habitat sites aside from the Estover Road section of the Plymbridge Lane & Estover Road SSSI, ecological receptor points (referred to as ECO 1 to ECO 28) have been considered in the air quality assessment. Details of these receptors are provided in Table 5, and their locations are shown on drawing ST21678-001.

[2] [Accessed at: https://magic.defra.gov.uk/]

Table 5: Existing Sensitive Ecological Receptor Points Considered in Air Quality Assessment			
Receptor	Designated Habitat Site	Location	
		X	Y
ECO 1	Bircham Valley LNR	250626	59616
ECO 2		250602	59675
ECO 3		250576	59785
ECO 4		250597	59827
ECO 5		250526	59514
ECO 6		250471	59338
ECO 7		250415	59271
ECO 8		250437	59018
ECO 9	Seaton and Lower Bircham LNR	250455	58957
ECO 10		250450	58880
ECO 11		250426	58789
ECO 12		250389	58685
ECO 13		250390	58570
ECO 14		250408	58413
ECO 15	Forder Valley LNR	250982	58386
ECO 16		250919	58387
ECO 17		250865	58387
ECO 18		250796	58389
ECO 19		250743	58386

Table 5: Existing Sensitive Ecological Receptor Points Considered in Air Quality Assessment			
Receptor	Designated Habitat Site	Location	
		X	Y
ECO 20	Plymbridge Lane & Estover Road SSSI (Plymbridge Lane section)	249951	59839
ECO 21	Tamar Estuaries Complex SPA Plymouth Sound & Estuaries SAC	246015	60270
ECO 22		246628	60891
ECO 23		246313	60604
ECO 24	South Dartmoor SAC	253411	63556
ECO 25		253755	63464
ECO 26	Dartmoor SAC	259914	61411
ECO 27		259387	62242
ECO 28		258981	63174

3.4.1 With regard to the Estover Road section of the Plymbridge Lane & Estover Road SSSI as this SSSI is adjacent to the site, receptors at this SSSI were modelled as a uniform Cartesian Grid. Details of this are shown in Table 6 below.

Table 6: Uniform Cartesian Grid Parameters (UCART1)		
Parameter	X	Y
South West Grid Coordinates	251542.88	59756.98
Number of Points	30	21
Spacing (m)	1.5	1.5
Length (m)	43.50	30
Total Number of Grid Receptors	630	

3.5 Limitations and Uncertainties

3.5.1 The atmospheric dispersion model has been run separately for the most recent five years of meteorological data, with the highest results presented.

3.5.2 The assessment assumes that the two exhaust stacks will be operational continuously throughout the year. In reality the stacks will not run continuously and therefore this assessment is considered to be overly robust.

3.5.3 As a result of these conservative inputs, the model is considered more likely to provide an overestimation of the potential air quality effects, associated with the two stacks, than an underestimation.

4 BASELINE SITUATION

4.1 Background Air Pollutant Concentrations at Existing Sensitive Human Receptors

4.1.1 The air quality assessment needs to take into account background concentrations upon which the predicted pollutant concentrations from the exhaust stacks are superimposed.

4.1.2 There are no representative background pollutant monitoring locations in the vicinity of the site. Advice has been sought from the EA with regard to the appropriate background concentrations to use in the assessment, who have provided the data detailed in Table 7 below.

Table 7: Background Air Pollutant Concentrations Used in the Air Quality Assessment

Receptor	Sulphuric Acid (µg/m^3)[a]	Hydrogen Fluoride (µg/m^3)[b]
ESR 1	0.00	0.003
ESR 2	0.00	0.003
ESR 3	0.00	0.003
ESR 4	0.00	0.003
ESR 5	0.00	0.003
ESR 6	0.00	0.003
ESR 7	0.00	0.003

[a] *In Line with advice from the EA, Sulphuric Acid isn't monitored, and it is regularly assumed the background is zero.*
[b] *In line with advice from the EA, a background concentration of 0.003 is routinely used within EA checks.*

5 IMPACT ASSESSMENT

5.1 Assessment of Pollutant Concentrations

5.1.1 Sulphuric Acid and HF concentrations, as a result of the operation of the two exhaust stacks, have been modelled at a number of existing human and ecological sensitive receptors/receptor points, where applicable.

5.2 Sulphuric Acid Concentrations

5.2.1 The background concentrations of Sulphuric Acid, detailed in Table 7, have been used to determine the PEC concentrations at each human receptor, for each year of meteorological data. The PC and PEC concentrations as a percentage of the relevant air quality objective have then been determined for each receptor, for each year of meteorological data.

5.2.2 The highest concentrations/percentages, for the considered existing sensitive human receptors, are summarised in Table 9.

Table 9: Maximum Modelled Sulphuric Acid Concentrations for Existing Sensitive Human Receptors

Pollutant	AQO	ESR	PC	PEC	PC/AQO	PEC/AQO
Sulphuric Acid 1 hour mean	300µg/m^3	ESR 4	10.51µg/m^3	10.51µg/m^3	3.50%	3.50%
Sulphuric Acid Annual Mean	10µg/m^3	ESR 5	0.09µg/m^3	0.09µg/m^3	0.94%	0.94%

HF Concentrations

5.2.3 The background concentrations of HF, detailed in Table 7, have been used to determine the PEC concentrations at each human receptor, for each year of meteorological data. The PC and PEC concentrations as a percentage of the relevant air quality objective have then been determined for each receptor, for each year of meteorological data.

5.2.4 The highest concentrations/percentages, for the considered existing sensitive human receptors, are summarised in Table 10.

Table 10: Maximum Modelled HF Concentrations for Existing Sensitive Human Receptors						
Pollutant	**AQO**	**ESR**	**PC**	**PEC**	**PC/AQO**	**PEC/AQO**
HF 1 hour mean	160mg/m^3	ESR 4	0.18mg/m^3	0.18mg/m^3	0.11%	0.11%
HF Monthly mean	16mg/m^3	ESR 5	0.003mg/m^3	0.006mg/m^3	0.020%	0.039%

Summary

5.2.5 The results confirm that the maximum modelled PCs and PECs do not exceed the relevant air quality objectives/EALS for the existing residential receptors considered in the assessment (i.e. ESR 1 to ESR 7).

5.2.6 On this basis, it is therefore considered that the proposed exhaust heights for the two stacks are sufficient to ensure the adequate dispersion of Sulphuric Acid and HF, and therefore further mitigation will not be required.

5.2.7 The modelled Sulphuric Acid and HF concentrations for the considered receptors are detailed in **Appendix C**.

5.3 Existing Sensitive Ecological Receptor Points

5.1.2 In line with the EA guidance, the short-term HF PCs have been compared against the relevant critical levels. The PC values, as a percentage of the relevant critical level, have been determined for each receptor point considered, for each year of meteorological data.

5.1.3 There are no critical levels provided by the EA for airborne Sulphuric Acid emissions at ecological habitat sites and therefore this has been excluded from the ecological assessment.

HF Airborne Concentrations

5.3.1 Short-term and long-term PCs have been predicted at the existing sensitive ecological receptor points. The highest concentrations/percentages are summarised in Table 11.

Table 11: Maximum Modelled HF Concentrations for Existing Sensitive Ecological Receptor Points				
Pollutant	**Critical Level**	**Habitat Site**	**PC (µg/m^3)**	**PC as % of Critical Level**
HF Daily Mean	5µg/m^3	Plymbridge Lane & Estover Road SSSI (Estover road section)	0.451	9.03%
		Bircham Valley LNR	0.01	0.16%
		Seaton & Lower Bircham LNR	0.0033	0.07%
		Forder Valley LNR	0.0030	0.06%
		Plymbridge Lane & Estover Road SSSI (plymbridge lane section)	0.004	0.08%
		Tamar Estuaries Complex SPA	0.00036	0.01%
		Plymouth Sound SAC	0.00036	0.01%
		South Dartmoor SAC	0.00046	0.02%
		Dartmoor SAC	0.00006	0.00%
HF Weekly Mean	0.5µg/m^3	Plymbridge Lane & Estover Road SSSI (Estover road section)	0.508	101.61%
		Bircham Valley LNR	0.030	6.03%
		Seaton & Lower Bircham LNR	0.012	2.32%
		Forder Valley LNR	0.010	2.01%
		Plymbridge Lane & Estover Road SSSI (plymbridge lane section)	0.019	3.81%
		Tamar Estuaries Complex SPA	0.001	0.25%
		Plymouth Sound SAC	0.001	0.25%

Table 11: Maximum Modelled HF Concentrations for Existing Sensitive Ecological Receptor Points				
Pollutant	**Critical Level**	**Habitat Site**	**PC (μg/m³)**	**PC as % of Critical Level**
		South Dartmoor SAC	0.002	0.41%
		Dartmoor SAC	0.0002	0.05%

5.3.2 With regard to the short term mean HF concentrations (ie the weekly and daily mean), contributions can be screened out at all but one of the designated habitat sites on the basis that the maximum modelled PCs do not exceed 10% of the short-term critical level. The PC exceeds 10% of the short-term weekly mean critical level at the Estover Road section of the Plymbridge Lane & Estover Road SSSI. Therefore, contributions to weekly mean HF concentration cannot be screened out at this habitat site.

Summary

5.3.3 The results confirm that the maximum modelled PCs do not exceed the relevant criteria for the critical levels for any of the modelled locations considered in the assessment (i.e. at ECO 1 to ECO 28) and UCART2, aside from the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site) .

5.3.4 A robust methodology has been adopted within the assessment which assumes the emissions from the stacks are emitted continuously. Even under such a robust methodology, significant pollutant contributions can be screened out at all habitat sites considered within the assessment with the exception of the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site).

5.3.5 It is recommended that further consideration be given to this result by seeking further advice from an ecologist to determine the significance of the predicted pollutant concentrations within this habitat site.

5.3.6 The maximum modelled HF concentrations expressed as a percentage of the relevant critical levels respectively, for the considered existing sensitive ecological receptor location points, are detailed in **Appendix D**.

6 CONCLUSIONS

7.1.1 Atmospheric dispersion modelling has been undertaken using AERMOD to consider emissions associated with two proposed exhaust stacks at the Altilium Metals site in Plymouth.

7.1.2 The results confirm that the maximum modelled PCs do not exceed the relevant criteria for the critical levels for any of the modelled locations considered in the assessment (i.e. at ECO 1 to ECO 28) and UCART2, aside from the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site) .

7.1.3 A robust methodology has been adopted within the assessment which assumes the emissions from the stacks are emitted continuously. Even under such a robust methodology, significant pollutant contributions can be screened out at all habitat sites considered within the assessment with the exception of the weekly mean HF concentration at the Estover Road section of the Plymbridge Lane & Estover Road SSSI (i.e. directly adjacent to the site).

7.1.4 It is recommended that further consideration be given to this result by seeking further advice from an ecologist to determine the significance of the predicted pollutant concentrations within this habitat site.

APPENDICES

APPENDIX A: AIR QUALITY LEGISLATION AND GUIDANCE

National Air Quality Strategy

A.1 The Environment Act 1995, as amended 2021, requires the UK government to prepare a national Air Quality Strategy. The first UK strategy was published in March 1997, setting out policies for the management of ambient air quality. This was subsequently updated in 2007[1].

A.2 The 2007 strategy establishes the framework for air quality management in England, Scotland, Wales and Northern Ireland. Air quality standards and objectives are set out for eight pollutants which may potentially occur at levels that give cause for concern. The strategy also provides details of the role that local authorities are required to take in working towards improvements in air quality, known as the Local Air Quality Management (LAQM) regime.

A.3 Defra published an updated air quality strategy in April 2023, and updated in August 2023[2]. The revised strategy supersedes the 2007 strategy in England only and provides a framework to enable local authorities to make the best use of their powers and make improvements for their communities. It also includes guidance on the new fine particulate matter targets for England.

Air Quality Standards and Objectives

A.4 Air quality standards and objectives are set out in the strategy for the following pollutants: nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), lead (Pb), fine particulate matter (PM_{10}), benzene (C_6H_6), 1, 3–butadiene (C_4H_6) and ozone (O_3).

A.5 Objectives for each pollutant, except O3, were first given statutory status in the Air Quality (England) Regulations 2000[3] and Air Quality (England) (Amendment) Regulations 2002[4]. These objectives are defined in the strategy as:

> *"the maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, within a specified timescale."*

A.6 EU limit values, set out within the Ambient Air Quality Directive 2008/50/EC[5] (i.e. the CAFE

[1] Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007
[2] Department of Environment, Food and Rural Affairs, Air quality strategy: framework for local authority delivery, August 2023
[3] The Air Quality (England) Regulations 2000. SI No 928
[4] The Air Quality (Amendment) Regulations 2002
[5] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Directive), were transposed into UK legislation on 11th June 2011 as The Air Quality Standards Regulations 2010. These are mostly the same as the air quality objectives in terms of concentrations; however, there are differences in determining how compliance is achieved. Although the UK is no longer part of the EU, no changes have yet been made to the objectives and limit values used in the management and assessment of air quality.

A.7 Whilst there is no specific objective for $PM_{2.5}$ in England, a limit value of 20µg/m^3 is referred to in the regulations, which has been adopted for use in this assessment (as recommended by the LAQM Helpdesk). An objective has been set for $PM_{2.5}$ in Scotland since early 2016. The Environment Act 2021 sets out a requirement to establish a target objective for $PM_{2.5}$, and this has now been set through the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. Annual mean concentrations of $PM_{2.5}$ must now meet a target of 10 µg/m^3 across England by 2040.

A.8 Examples of where these objectives and limit values apply are detailed in the Defra LAQM Technical Guidance document LAQM.TG(22)[6] and are included in Table A1.

Table A1: Examples of Where the Air Quality Objectives Should Apply

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens of residential properties [a]	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour objectives apply.	Kerbside sites where public would not be expected to have regular

[6] Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(22), August 2022

Table A1: Examples of Where the Air Quality Objectives Should Apply		
Averaging Period	**Objectives Should Apply at:**	**Objectives Should Generally Not Apply at:**
	Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend one hour or longer	access
15-minute mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer	
[a] Such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied		

Local Air Quality Management

A.9 LAQM legislation in the Environment Act 1995 requires local authorities to conduct the periodic review and assessments of air quality. These aim to identify all those areas where the objectives are being, or are likely to be, exceeded. Where exceedances are likely to occur, local authorities are required to declare an Air Quality Management Area (AQMA).

A.10 LAQM.TG(22) presents a streamlined approach for LAQM in England and Scotland; however, Northern Ireland is still considering changes to LAQM and therefore works according to the previous regime.

A.11 The Welsh Government amended the LAQM regime in Wales in 2017 by issuing new statutory policy guidance in order to bring the system into line with the Well-being of Future Generations (Wales) Act 2015[7]. This aims to achieve compliance with the national air quality objectives in specific hotspots and to reduce exposure to pollution more widely, so as to achieve the greatest public health benefit.

A.12 Local authorities in England are required to produce Annual Status Reports (ASRs), and in Scotland, Annual Progress Reports (APRs). These replace all other reports which

[7] Well-being of Future Generations (Wales) Act 2015 (anaw 2)

previously had to be submitted including Updating and Screening Assessments, Progress Reports and Detailed Assessments (which would be produced to assist with an AQMA declaration).

A.13 Local authorities now have the option of a fast-track AQMA declaration option. This allows more expert judgement to be used and removes the need for a Detailed Assessment where a local authority is confident of the outcome. Detailed Assessments should however still be used if there is any doubt.

A.14 As part of the UK Government's requirement to improve air quality, selected local authorities in England are also currently investigating the feasibility of setting up Clean Air Zones (CAZs). These are areas where targeted action and co-ordinated resources aim to improve air quality within an urban setting, in order to achieve compliance with the EU Limit Values within the shortest possible time.

A.15 The first CAZs were implemented in Bath in March 2021, and in Birmingham in June 2021. Since then, CAZ's have also been declared in Bradford, Bristol, Portsmouth, Sheffield and Tyneside (Newcastle and Gateshead). In addition, the London Ultra Low Emission Zone (ULEZ) has now been expanded to incorporate all London Boroughs.

National Planning Policy Framework

A.16 The National Planning Policy Framework (NPPF)[8], introduced in March 2012, updated in February 2025, requires that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of AQMAs and CAZs, and the cumulative impacts from individual sites in local areas.

Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.

Planning decisions should ensure that any new development in AQMAs and CAZs is consistent with the local air quality action plan."

Planning Practice Guidance

[8] Ministry of Housing, Communities and Local Government, National Planning Policy Framework, January 2025

A.17 The Planning Practice Guidance (PPG)[9], updated in November 2019, states that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impacts in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).

A.18 Where a proposed development is anticipated to give rise to concerns about air quality, an appropriate assessment needs to be carried out. Where the assessment concludes that the proposed development (including mitigation) will not lead to an unacceptable risk from air pollution, prevent sustained compliance with national objectives or fail to comply with the requirements of the Habitats Regulations, then the local authority should proceed to decision with appropriate planning conditions and/or obligations.

Institute of Air Quality Management – A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites

A.19 Guidance has been prepared by the IAQM with relation to the assessment of air quality impacts on designated nature conservation sites[10]. For the assessment of point sources, such as stacks associated with industrial processes, this makes reference to the Environment Agency (EA) guidance on carrying out a risk assessment as part of an Environmental Permit application (including the screening distances for habitat sites and the criteria for screening out significant effects).

Environment Agency Guidance on Air Emissions Risk Assessments

A.20 The Environment Agency (EA) has produced guidance to support the completion of an air emissions risk assessment as part of Environmental Permit applications[11]. This sets out steps to be followed when carrying out a risk assessment, including defining when detailed atmospheric dispersion modelling is required as part of an Environmental Permit application. The document also sets out environmental benchmarks for a range of pollutants and the required contents of air dispersion modelling reports.

AQTAG06 – Technical Guidance on Detailed Modelling Approach for an Appropriate

[9] Department for Communities and Local Government. Planning Practice Guidance: Air Quality, November 2019
[10] Institute of Air Quality Management, A Guide to the Assessment of Air Quality Impacts at Designated Nature Conservation Sites v1.1, May 2020
[11] Environment Agency, Air emissions risk assessment for your environmental permit, January 2025 [Accessed at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit]

Assessment for Emissions to Air

A.21 Guidance has been produced[12] to provide an overview of how a quantitative assessment (Stage 3 appropriate assessment) should be carried out, using short range modelling to consider emissions to air arising from an Environmental Permitting Regulations (EPR) process, to fulfil the requirements of the Habitats Regulations.

A.22 The guidance provides details of the different inputs required for a dispersion modelling exercise. In addition, it sets out recommended deposition velocities for both grassland and forest habitats, which are used in an assessment of nutrient nitrogen and acid deposition.

Guidance on Evaluating Model Impacts Against Critical Loads

A.23 A method for calculating exceedance of the acidity critical load function, and the contribution from a source to the critical load function, is provided on the Air Pollution Information System (APIS) website[13].

A.24 The critical load function, which was developed under the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP), defines combinations of sulphur and nitrogen deposition, and so allows the combined inputs of sulphur and nitrogen deposition to be considered. The function is a three-node line on a graph representing the acidity critical load, with combinations above this line exceeding the critical load. All areas below or on the line represent an “envelope of protection” where critical loads are not exceeded. An example graph is shown in Figure 1, below.

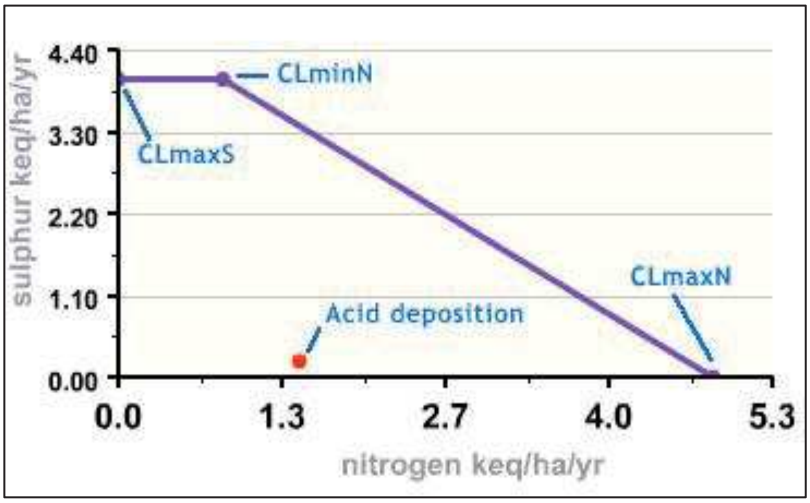


Figure 1: Example critical load function graph, reproduced from the APIS website

[12] Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air, AQTAG06, March 2014

[13] [Accessed at: http://www.apis.ac.uk/clf-guidance]

A.25 The guidance enables a calculation to be made of the contribution to acid deposition as a percentage of the relevant critical load value, and advises:

"Where PEC is greater than CLminN (the majority of cases), the combined inputs of sulphur and nitrogen need to be considered. In such cases, the total acidity input should be calculated as a proportion of the CLmaxN.

Where PEC N Deposition > CLminN

*PC as %CL function = ((PC of S+N deposition)/CLmaxN)*100"*.

APPENDIX 6.3: METHODOLOGY FOR OPERATIONAL PHASE ASSESSMENTS

Atmospheric Dispersion Modelling

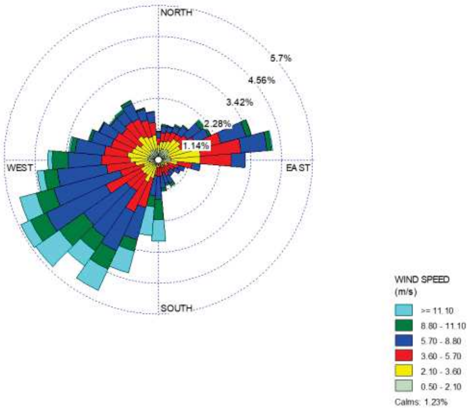
B.1 The atmospheric dispersion model AERMOD (Lakes Environmental) has been used to assess the potential air quality impacts associated with the operation of the three proposed stacks. This dispersion model is widely used and accepted for the purpose of undertaking assessments to support both planning and Environmental Permit applications.

Meteorological Data

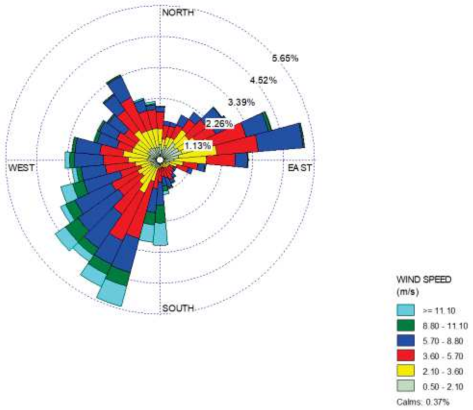
B.1 The meteorological data used in the air quality modelling has been obtained from ADM Limited and is from the Plymouth recording station, covering the period between 1st January 2020 and 31st December 2024.

B.2 The 2020 to 2024 wind roses for the Plymouth meteorological recording station are shown in Figure B1. Each year has been run separately in the model.

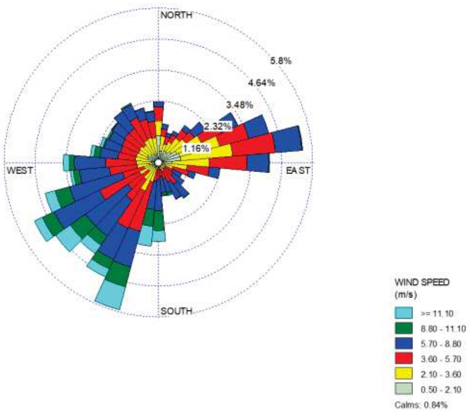
2020



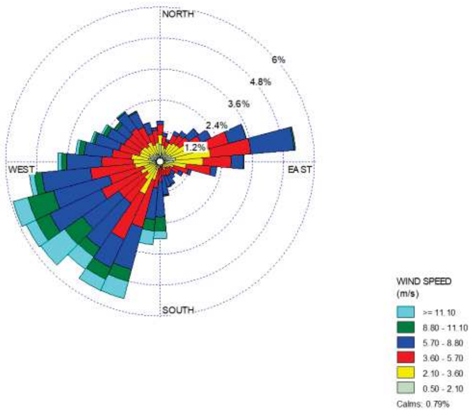
2021



2022



2023



2024

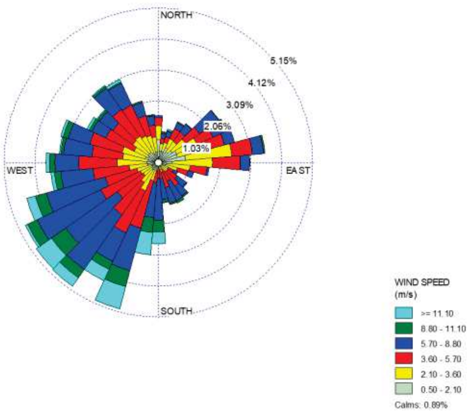


Figure B1: 2020 to 2024 Wind Roses for Plymouth Recording Station

Surface Characteristics

B.3 The predominant characteristics of land use in an area provides a measure of the vertical mixing and dilution that takes place in the atmosphere due to factors such as surface roughness and albedo.

B.4 The meteorological data has been processed using AERMET, the supporting meteorological pre-processing software (Lakes Environmental, Version), to enable the surface characteristics to be set in the model.

B.5 The values set within the model are included in Table B1.

Table B1: Surface Characteristics Included in Model		
Setting	**Deciduous Forest**	**Urban**
Albedo	0.215	0.2075
Bowen ratio	0.875	1.625
Surface roughness	0.9m	1m

B.6 Buildings can also have a significant influence on the behaviour of the local airflow and 'downwash' can occur, where an emission plume can be drawn down in the vicinity of buildings. There are a number of existing buildings near to the sources of the emissions, as well as the proposed buildings, and therefore building effects have been included within the model.

B.7 Further details of the buildings included in the model are provided later in this appendix.

Terrain

B.8 To consider the impact of terrain surrounding the site, on the dispersion of pollutants, OS Terrain 5 data has been used in the model (in x.y.z format). This has been processed using the in-built AERMAP terrain processor.

Emission Parameters

B.9 Information regarding the three exhausts has been provided by Altilium Metals. The parameters included in the model are shown in Table B2.

Table B2: Model Parameters for Sources Included in Model		
Parameter	Input in Model	
	Acid Leaching	Solvent Extraction
Flue location (X,Y)	251593 , 059817	251585 , 059795
Ref in Model	STCK1	STCK2
Base elevation	117.6m	117.6m
Exhaust height	12	12
Exhaust diameter	0.3m	0.3m
Exhaust gas flow at exit (Am^3/hr)	1700	800
Exhaust gas flow at exit (Am^3/s)	0.472	0.222
Exhaust efflux velocity (m/s)	6.677	3.141
Exhaust gas exit temp. (°C)	15*	15*
*Temperature of stacks is ambient, so average ambient temperature has been used in the calculation of normalised flow rates, and the ambient temperature option selected in the AERMOD source input page for both stacks.		

B.10 The locations of the exhausts in the model are shown in Figure B2, overleaf.

Figure B2: Location of Exhausts in Model

B.11 The emission concentrations for each substance, as well as the calculated emission rates, are shown in Table B3, overleaf.

Table B3: Emission rates from the Gas Engine Exhausts		
Emitted Substance	**Input in Model**	
	Acid Leaching	**Solvent Extraction**
Emission Concentration (mg/Nm^3)		
Sulphuric Acid	35	35
HF	1	N/A
Emission Rate (g/s)		
NO_X	0.0157	0.0074
CO	0.0004	N/A

Treatment of Buildings

B.12 There are a number of existing buildings located within, and near to, the existing Altilium Metals buidling. The buildings included within the model are detailed in Table B4, and their locations are shown in Figure B3.

Table B4: Onsite Buildings Included in Model						
Building Number	Building Name in Model	Building Description	Base Elevation (m)	Height of Building (m)	Grid Reference of SW Corner/ Centre of Circle	
					X	Y
1	BLD_1	Altilium Metals	117.6	10	251534	59830
2	BLD_2	Existing business within Industrial Estate	115.6	9	251584	59733
3	BLD_3		112.33	12	251717	59789
4	BLD_4		113.84	9	251696	59830
5	BLD_5		114.05	9	251645	59862
6	BLD_6		117.11	9	251611	59900
7	BLD_7		121.2	9	251441	59774
8	BLD_8		118.7	8	251446	59759
9	BLD_9		114.13	9	251507	59688
10	BLD_10		110.26	9	251587	59623
11	BLD_11		110.29	9	251680	59668

B.13 The locations of the buildings are shown in Figure B3.

Figure B3: Location of Buildings in Model

Appendix C: Predicted Sulphuric Acid and HF Concentrations for Existing Sensitive Human Receptors

Predicted Sulphuric Acid Concentrations

C.1 The predicted sulphuric acid concentrations for the existing sensitive receptors and points across the receptor grid, for each year of meteorological data, are shown below. The highest results for the receptors considered are highlighted in red.

Sulphuric Acid		2020											
				SHORT TERM - 1 hour mean					LONG TERM - annual mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE											
		X	Y	μg/m³	μg/m³	μg/m³	%	%	μg/m³	μg/m³	μg/m³	%	%
ESR 1				5.67	5.67	5.67	1.89	1.89	0.01	0.01	0.01	0.10	0.10
ESR 2				2.21	2.21	2.21	0.74	0.74	0.01	0.01	0.01	0.12	0.12
ESR 3				6.15	6.15	6.15	2.05	2.05	0.04	0.04	0.04	0.38	0.38
ESR 4				9.88	9.88	9.88	3.29	3.29	0.06	0.06	**0.06**	0.64	0.64
ESR 5				6.78	6.78	6.78	2.26	2.26	0.06	0.06	0.06	0.62	0.62
ESR 6				6.42	6.42	6.42	2.14	2.14	0.04	0.04	0.04	0.37	0.37
ESR 7				8.73	8.73	8.73	2.91	2.91	0.06	0.06	0.06	0.57	0.57

2021

				SHORT TERM - 1 hour mean					LONG TERM - annual mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE											
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				6.75	6.75	6.75	2.25	2.25	0.02	0.02	0.02	0.16	0.16
ESR 2				4.43	4.43	4.43	1.48	1.48	0.02	0.02	0.02	0.15	0.15
ESR 3				6.80	6.80	6.80	2.27	2.27	0.04	0.04	0.04	0.40	0.40
ESR 4				10.51	**10.51**	**10.51**	**3.50**	**3.50**	0.08	0.08	0.08	0.85	0.85
ESR 5				9.05	9.05	9.05	3.02	3.02	0.09	0.09	0.09	0.86	0.86
ESR 6				8.03	8.03	8.03	2.68	2.68	0.05	0.05	0.05	0.50	0.50
ESR 7				6.66	6.66	6.66	2.22	2.22	0.06	0.06	0.06	0.64	0.64

2022

				SHORT TERM - 1 hour mean					LONG TERM - annual mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE											
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				4.30	4.30	4.30	1.43	1.43	0.01	0.01	0.01	0.11	0.11
ESR 2				1.71	1.71	1.71	0.57	0.57	0.01	0.01	0.01	0.12	0.12
ESR 3				5.19	5.19	5.19	1.73	1.73	0.03	0.03	0.03	0.35	0.35
ESR 4				6.34	6.34	6.34	2.11	2.11	0.08	0.08	0.08	0.75	0.75
ESR 5				6.24	6.24	6.24	2.08	2.08	0.09	**0.09**	**0.09**	**0.94**	**0.94**
ESR 6				6.58	6.58	6.58	2.19	2.19	0.04	0.04	0.04	0.40	0.40
ESR 7				7.72	7.72	7.72	2.57	2.57	0.06	0.06	0.06	0.55	0.55

2023

RECEPTOR	ADDRESS	GRID REFERENCE		SHORT TERM - 1 hour mean					LONG TERM - annual mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				4.52	4.52	4.52	1.51	1.51	0.01	0.01	0.01	0.12	0.12
ESR 2				1.61	1.61	1.61	0.54	0.54	0.01	0.01	0.01	0.11	0.11
ESR 3				3.79	3.79	3.79	1.26	1.26	0.03	0.03	0.03	0.31	0.31
ESR 4				10.42	10.42	10.42	3.47	3.47	0.06	0.06	0.06	0.59	0.59
ESR 5				9.06	9.06	9.06	3.02	3.02	0.07	0.07	0.07	0.69	0.69
ESR 6				7.49	7.49	7.49	2.50	2.50	0.03	0.03	0.03	0.35	0.35
ESR 7				8.92	8.92	8.92	2.97	2.97	0.06	0.06	0.06	0.61	0.61

2024

RECEPTOR	ADDRESS	GRID REFERENCE		SHORT TERM - 1 hour mean					LONG TERM - annual mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				3.35	3.35	3.35	1.12	1.12	0.01	0.01	0.01	0.10	0.10
ESR 2				2.28	2.28	2.28	0.76	0.76	0.01	0.01	0.01	0.12	0.12
ESR 3				6.67	6.67	6.67	2.22	2.22	0.04	0.04	0.04	0.36	0.36
ESR 4				10.51	10.51	10.51	3.50	3.50	0.07	0.07	0.07	0.74	0.74
ESR 5				5.07	5.07	5.07	1.69	1.69	0.08	0.08	0.08	0.75	0.75
ESR 6				5.72	5.72	5.72	1.91	1.91	0.04	0.04	0.04	0.38	0.38
ESR 7				4.72	4.72	4.72	1.57	1.57	0.05	0.05	0.05	0.54	0.54

Predicted HF Concentrations

C.2 The predicted HF concentrations for the existing sensitive receptors and points across the receptor grid, for each year of meteorological data, are shown, below. The highest results for the receptors considered are highlighted in red.

	Hydrogen Fluoride			2020									
				SHORT TERM - 1 hour mean					SHORT TERM - monthly mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE											
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				0.10	0.10	0.10	0.06	0.06	0.00	0.00	0.00	0.00	0.02
ESR 2				0.04	0.04	0.04	0.02	0.02	0.00	0.00	0.00	0.00	0.02
ESR 3				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03
ESR 4				0.17	0.17	0.17	0.11	0.11	0.00	0.00	**0.01**	0.01	0.03
ESR 5				0.12	0.12	0.13	0.08	0.08	0.00	0.00	0.00	0.01	0.03
ESR 6				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03
ESR 7				0.14	0.14	0.15	0.09	0.09	0.00	0.00	0.00	0.01	0.03
							<10%					<1%	<70%
					30.24			151.2					

				2021									
				SHORT TERM - 1 hour mean					SHORT TERM - monthly mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE		NO_X 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_X ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL
		X	Y	µg/m³	µg/m³	µg/m³	%	%	µg/m³	µg/m³	µg/m³	%	%
ESR 1				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.00	0.02
ESR 2				0.07	0.07	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.02
ESR 3				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03
ESR 4				0.17	0.17	0.17	0.11	0.11	0.00	0.00	0.01	0.02	0.03
ESR 5				0.16	0.16	0.16	0.10	0.10	0.003	**0.003**	**0.006**	**0.020**	**0.039**
ESR 6				0.13	0.13	0.14	0.08	0.09	0.00	0.00	0.00	0.01	0.03
ESR 7				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03

2022

				SHORT TERM - 1 hour mean					SHORT TERM - monthly mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE		NO_X 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_X ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL
		X	Y	µg/m^3	µg/m^3	µg/m^3	%	%	µg/m^3	µg/m^3	µg/m^3	%	%
ESR 1				0.07	0.07	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.02
ESR 2				0.03	0.03	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.02
ESR 3				0.09	0.09	0.10	0.06	0.06	0.00	0.00	0.00	0.01	0.03
ESR 4				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.01	0.01	0.03
ESR 5				0.12	0.12	0.12	0.07	0.08	0.00	0.00	0.01	0.01	0.03
ESR 6				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03
ESR 7				0.13	0.13	0.13	0.08	0.08	0.00	0.00	0.00	0.01	0.03

2023

				SHORT TERM - 1 hour mean					SHORT TERM - monthly mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE		NO_X 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_2 1 HOUR	NO_X ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL	NO_2 ANNUAL
		X	Y	µg/m^3	µg/m^3	µg/m^3	%	%	µg/m^3	µg/m^3	µg/m^3	%	%
ESR 1				0.07	0.07	0.07	0.04	0.05	0.00	0.00	0.00	0.00	0.02
ESR 2				0.03	0.03	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.02
ESR 3				0.06	0.06	0.07	0.04	0.04	0.00	0.00	0.00	0.01	0.03
ESR 4				0.18	0.18	0.18	0.11	0.11	0.00	0.00	0.00	0.01	0.03
ESR 5				0.16	0.16	0.16	0.10	0.10	0.00	0.00	0.01	0.01	0.03
ESR 6				0.12	0.12	0.13	0.08	0.08	0.00	0.00	0.00	0.01	0.03
ESR 7				0.15	0.15	0.15	0.09	0.09	0.00	0.00	0.00	0.01	0.03

2024

				SHORT TERM - 1 hour mean					SHORT TERM - monthly mean				
				PC	PC	PEC	PC/AQO	PEC/AQO	PC	PC	PEC	PC/AQO	PEC/AQO
RECEPTOR	ADDRESS	GRID REFERENCE											
		X	Y	µg/m^3	µg/m^3	µg/m^3	%	%	µg/m^3	µg/m^3	µg/m^3	%	%
ESR 1				0.06	0.06	0.06	0.04	0.04	0.00	0.00	0.00	0.00	0.02
ESR 2				0.04	0.04	0.04	0.02	0.02	0.00	0.00	0.00	0.00	0.02
ESR 3				0.11	0.11	0.11	0.07	0.07	0.00	0.00	0.00	0.01	0.03
ESR 4				0.17	0.17	0.17	0.11	0.11	0.00	0.00	0.01	0.01	0.03
ESR 5				0.09	0.09	0.09	0.05	0.06	0.00	0.00	0.01	0.01	0.03
ESR 6				0.09	0.09	0.10	0.06	0.06	0.00	0.00	0.00	0.01	0.02
ESR 7				0.08	0.08	0.08	0.05	0.05	0.00	0.00	0.00	0.01	0.03

Appendix D: Predicted HF Concentrations for Existing Sensitive Ecological Receptor Points

Predicted HF Concentrations as a Percentage of the Critical Levels

D.1 The predicted HF concentrations as a percentage of the relevant critical levels for the existing sensitive receptor points within the habitat sites considered, for each year of meteorological data, are shown below.

Bircham Valley LNR

	HF Daily Mean as % of Critical Level					**HF Weekly Mean as % of Critical Level**				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 1	0.13%	0.10%	0.09%	0.11%	0.14%	4.84%	4.58%	3.05%	3.42%	5.06%
ECO 2	0.08%	0.10%	0.09%	0.10%	0.09%	3.06%	4.49%	2.99%	2.99%	2.77%
ECO 3	0.08%	0.12%	0.09%	**0.16%**	0.14%	5.21%	5.32%	3.23%	5.51%	5.44%
ECO 4	0.08%	0.13%	0.09%	0.15%	0.13%	3.24%	5.37%	3.39%	**6.03%**	4.47%
ECO 5	0.09%	0.08%	0.07%	0.08%	0.11%	2.85%	4.11%	2.02%	4.14%	2.52%
ECO 6	0.09%	0.09%	0.07%	0.09%	0.11%	2.45%	3.33%	3.68%	2.07%	2.01%
ECO 7	0.09%	0.09%	0.06%	0.09%	0.09%	3.01%	2.51%	3.00%	1.77%	2.52%
ECO 8	0.04%	0.07%	0.06%	0.08%	0.05%	1.49%	2.73%	2.32%	2.62%	1.44%

Seaton LNR

	HF Daily Mean as % of Critical Level					**HF Weekly Mean as % of Critical Level**				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 9	0.04%	0.06%	0.06%	**0.07%**	0.05%	1.54%	2.03%	1.49%	2.00%	1.43%
ECO 10	0.04%	0.05%	0.06%	0.05%	0.04%	1.44%	**2.32%**	1.38%	1.41%	2.01%
ECO 11	0.04%	0.05%	0.06%	0.04%	0.04%	1.21%	1.99%	1.32%	1.59%	2.02%
ECO 12	0.04%	0.04%	0.05%	0.04%	0.03%	1.53%	1.58%	1.17%	1.63%	1.58%
ECO 13	0.04%	0.03%	0.04%	0.03%	0.03%	1.47%	1.08%	1.05%	1.20%	1.08%
ECO 14	0.04%	0.03%	0.03%	0.03%	0.03%	1.20%	1.23%	1.26%	1.01%	1.04%

Forder Valley LNR

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 15	0.04%	0.05%	0.04%	0.04%	0.04%	1.42%	**2.01%**	1.96%	2.00%	1.21%
ECO 16	0.04%	**0.06%**	0.04%	0.03%	0.04%	1.27%	1.94%	1.30%	1.91%	1.18%
ECO 17	0.04%	0.06%	0.04%	0.03%	0.04%	1.23%	1.83%	1.26%	1.80%	1.74%
ECO 18	0.04%	0.04%	0.04%	0.03%	0.04%	1.19%	1.22%	1.21%	1.20%	1.62%
ECO 19	0.04%	0.04%	0.04%	0.03%	0.04%	1.16%	1.13%	1.52%	1.11%	1.23%

Plymbridge lane & Ester Road SSSI (Plymbridge lane section)

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 20	0.04%	**0.08%**	0.04%	0.08%	0.07%	2.43%	3.33%	2.04%	**3.81%**	2.57%

Tamar Estuaries SPA

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 21	0.00%	**0.01%**	0.01%	0.00%	0.00%	0.19%	0.22%	0.21%	0.20%	0.22%
ECO 22	0.01%	0.01%	0.00%	0.00%	0.00%	**0.25%**	0.22%	0.21%	0.22%	0.18%
ECO 23	0.01%	0.01%	0.01%	0.00%	0.01%	0.19%	0.22%	0.21%	0.22%	0.18%

Plymouth Sounds SAC

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 21	0.00%	0.01%	0.01%	0.00%	0.00%	0.19%	0.22%	0.21%	0.20%	0.22%
ECO 22	0.01%	0.01%	0.00%	0.00%	0.00%	**0.25%**	0.22%	0.21%	0.22%	0.18%
ECO 23	0.01%	0.01%	0.01%	0.00%	0.01%	0.19%	0.22%	0.21%	0.22%	0.18%

South Dartmoor SAC

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 24	0.01%	0.00%	0.01%	**0.02%**	0.01%	0.36%	0.27%	0.28%	0.38%	0.38%
ECO 25	0.01%	0.01%	0.01%	0.01%	0.01%	0.24%	0.37%	**0.41%**	0.38%	0.36%

Dartmoor SAC

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 26	0.00%	**0.00%**	0.00%	0.00%	0.00%	0.04%	**0.05%**	0.04%	0.04%	0.04%
ECO 27	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.02%	0.03%	0.04%	0.01%
ECO 28	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.03%	0.02%	0.01%	0.03%

Plymbridge lane & Ester Road SSSI (Estover Road section)

	HF Daily Mean as % of Critical Level					HF Weekly Mean as % of Critical Level				
	2020	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
ECO 20	7.31%	**9.03%**	7.48%	8.82%	7.88%	101.31%	101.61%	97.45%	97.37%	**101.61%**

Appendix E: Professional Experience

E.1 Details of the experience of the personnel involved with the project are provided below:

Paul Threlfall **Associate Director (Air Quality)**
BSc (Hons), MSc, MIEnvSc, MIAQM

Paul joined Wardell Armstrong in October 2017 as an Air Quality Scientist, after completing his MSc Water, Energy and the Environment at Liverpool John Moores University. The majority of his work is carried out in support of planning applications and, therefore, he has experience of undertaking air quality assessments for a wide range of projects including residential developments, commercial developments, and mixed-use developments. Paul also has extensive experience of undertaking detailed air quality assessments for large industrial developments for both planning and permit applications.

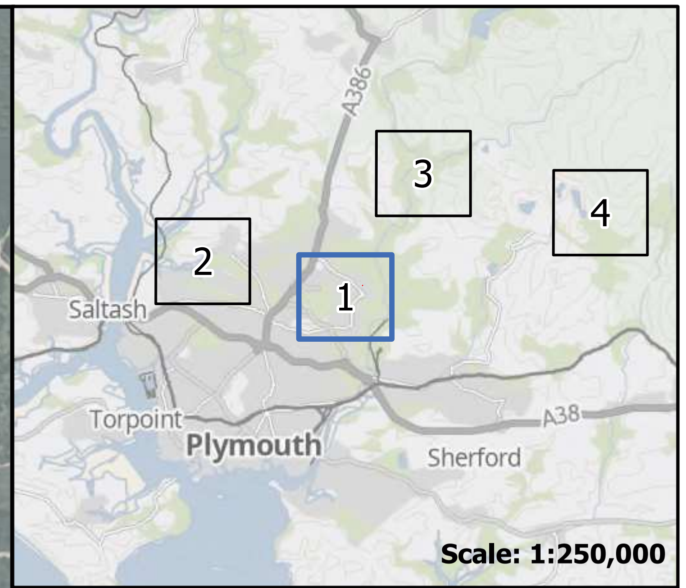
Paul has a broad range of skills and knowledge of air quality modelling and monitoring through his involvement in air quality projects, both as individual commissions and as part of Environmental Impact Assessments (EIAs). Paul also has extensive knowledge and experience of undertaking odour assessments, ranging from qualitative desk-based assessments to more detailed odour dispersion modelling assessments using AERMOD, as well as extensive experience of undertaking odour 'sniff test' observations.

Malcolm Walton **Technical Director & Service Lead**
BSc (Env Health) Dip (Acoustics & Noise Control) MCIEH AMIOA

Malcolm holds a Bachelor of Science degree in Environmental Health and the Diploma in Acoustics and Noise Control. Malcolm is a Member of the Chartered Institute of Environmental Health and an Associate Member of the Institute of Acoustics.

Malcolm joined Wardell Armstrong in September 2001 following 12 years working as an Environmental Health Officer in several local authorities, responsible for the enforcement of environmental legislation and, in particular, air pollution and noise nuisance. Malcolm has experience in the technical co-ordination of environmental appraisal of large schemes to UK and international standards. Malcolm regularly carries out and co-ordinates noise and air quality assessment work associated with planning applications including EIA work and PPC permit application/compliance. He also regularly acts as expert witness in planning inquiries in respect of noise, air quality and odour.

DRAWINGS



KEY

- Site Boundary
- ECO Receptors
- ESR Receptors

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UNIT 2 PLYMBRIDGE HOUSE

PROJECT

UNIT 2 PLYMBRIDGE HOUSE

DRAWING TITLE

ESR AND ECO RECEPTOR LOCATIONS
SHEET 1 OF 4

DRG No.	REV	SUIT. CODE
ST21678-001	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	02/06/2025

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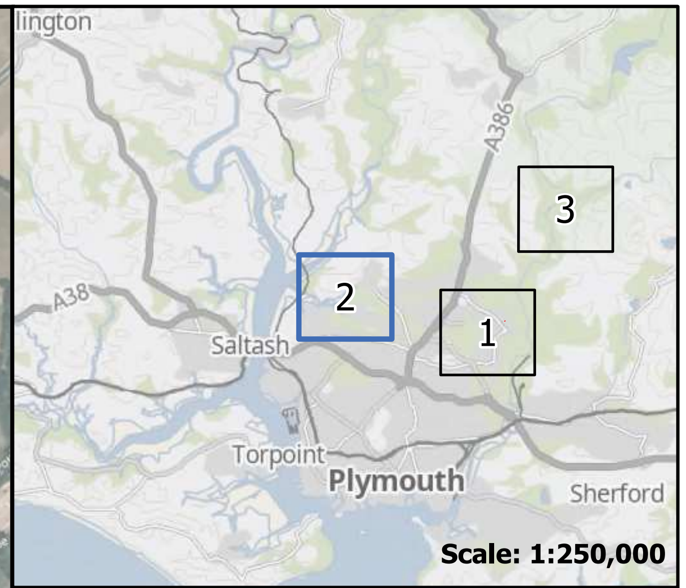

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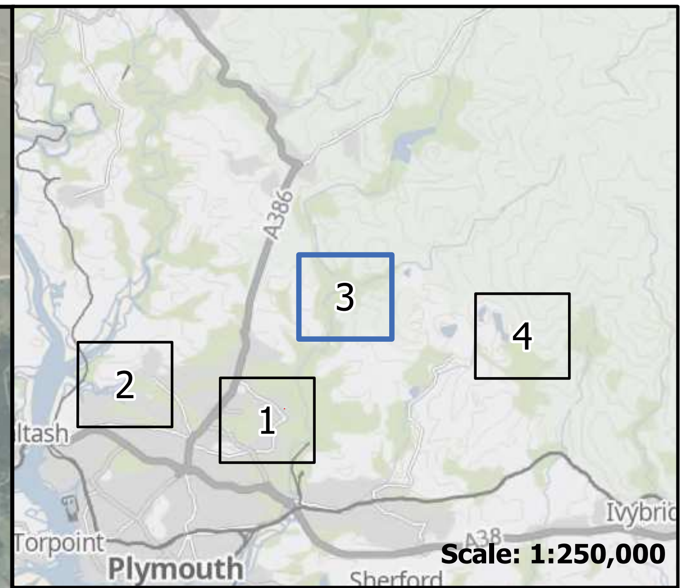

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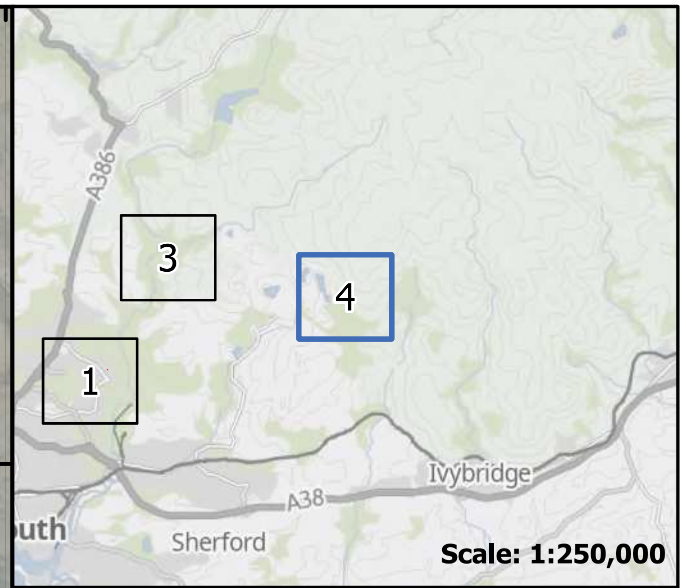

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