

**GAS-FIRED STANDBY ELECTRICITY GENERATION FACILITY
HERMITAGE PARK, HARTS FARM WAY, HAVANT
AIR QUALITY ASSESSMENT**

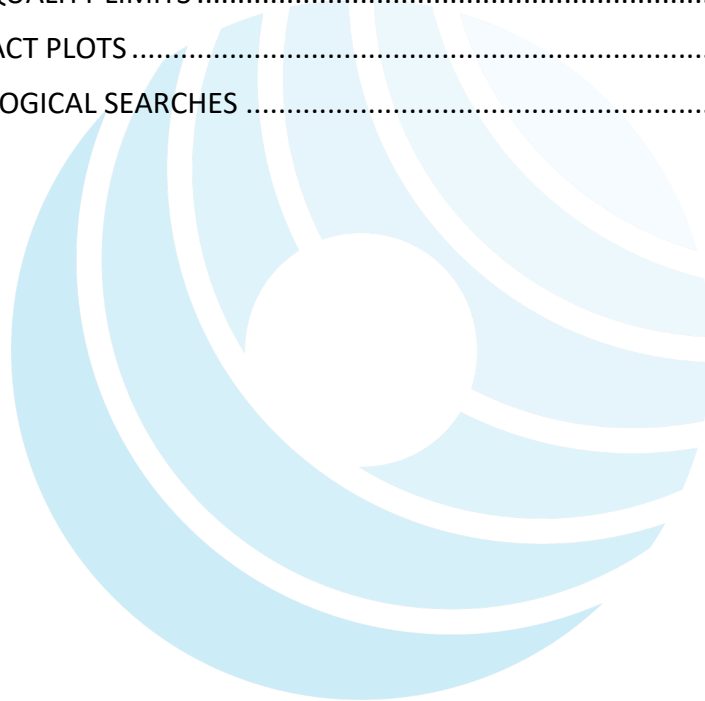
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1.0 INTRODUCTION

1.1 Background

This air quality assessment has been undertaken by Isopleth Ltd further to instruction by Forsa Energy Gas Holdings Ltd (hereafter referred to as 'Forsa').

The assessment considers air quality impacts associated with the proposed development of a small scale standby electricity generation plant (SSSEGP) peaking power plant at their land at Hermitage Park, Harts Farm Way, Havant (Drawing AQ1). The site, also referred to as 'Havant' lies within the administrative area of Havant Borough Council (HBC).

The proposed development will be for 5 No. Jenbacher spark ignition engines, fuelled by natural gas, for electricity generation that together will generate a total of 20.6MW_e with stacks at a height of 12.8m.

The impact of the proposed electricity generation facility on local air quality has been assessed. The type, source and significance of potential impacts are identified and the measures employed to minimise these impacts are described.

The key pollutant associated with operation of the spark ignition engines considered in this assessment are oxides of nitrogen (NO_x as NO₂), the primary pollutants arising from the combustion of natural gas, for which there is a quantitative limit. Other pollutants, such as sulphur dioxide (SO₂), sometimes associated with the operation of spark ignition engines (when run on biogas) are generated in negligible levels when using this fuel type. Predicted ground level concentrations of NO₂ are compared with relevant air quality standards and guidelines for the protection of human health and sensitive habitats.

1.2 Planning History

The most recent Planning application for the site ref: APP/21/00809 was approved on 19th January 2023:

'Proposed Gas fuelled Capacity Mechanism embedded generation plant to support the National Grid. A resubmission of previously approved applications (APP/17/00511 as amended by APP/18/01281) in order to secure a further three years to commence development following transfer of ownership of the site. Hermitage Park, Harts Farm Way, Havant'

The scheme proposed for application APP/21/00809 consisted of 10 No. MTU 20V4000 GS (GG20V4000A1) gas- fired engines, each rated at 2.535kW_e. Each engine was assumed to site within its own container with its own individual 8.5m stack. The modelled hours of operation were a maximum of 1500 per year.

1.3 Scope

This detailed assessment report relates to the impact of air pollutants from the operation of the proposed electricity generation facility. Results of the dispersion modelling for engine exhaust emissions are presented in terms of concentrations, with a description of magnitude and also determination of significance where relevant.



2.0 SITE DESCRIPTION

2.1 Location

The application is located at Hermitage Park which is a purpose built industrial park located off Harts Farm Way. The site is a square parcel of land on the south west of Hermitage Park although there are no clear defined site boundaries. The site is currently occupied by some hardstanding and overgrown vegetation with peripheral trees along the northern and western boundaries, with the A27 dual carriageway beyond the Park to the north of the site. The site is located in a Flood Zone 1 with a main river line running adjacent to the site and a surface water sewer crossing the site. Further afield to the site lies a range of commercial and industrial uses.

The approximate National Grid Reference for the site is 470620,105835. A location plan of the site is presented as Drawing AQ1.

There is an adjacent installation operated by Peak Gen Power Limited (Peak Gen), approximately 170m to the northwest of the Proposed Installation. The adjacent installation consists of 10 diesel (compression-ignition) engines. The emissions from that facility will now form part of the air quality background.

2.2 Development Description

The site will operate on a largely unmanned basis and will be remotely operated by Forsa. The standby, natural gas fuelled spark ignition engines provide balance to the National Grid during unexpected periods of high demand for electricity or where there are constraints on electricity available in England and Wales.

The proposed facility will comprise:

- 4 No. 4.499 MW_e Jenbacher J624, K12 spark ignition engines; and
- 1 No. 2.676 MW_e Jenbacher J616, J12 spark ignition engines.

The engines will be fuelled by natural gas, for electricity generation that together will generate a total of 20.6 MWe. Emissions to air will be via 5 No. engine exhausts of 12.8m in height, each serving a single engine.

The NO_x emission concentration of the engines is **250 mg/Nm³ at 5% O₂, 0 degC, 1atm, dry**. This may be converted to differing oxygen concentrations using the equation in MCERTS monitoring Guidance M2 Box 3.5. In this case, the concentration may also be expressed as **95 mg/Nm³ at 15% O₂, 0 degC, 1atm, dry**.

This air quality assessment assumes that each of the engines within the power plant will operate for a maximum of 3000 hours per year.

3.0 REGULATORY STANDARDS AND GUIDELINES

3.1 International Legislation and Policy

European Directive 2008/50/EC of the European Parliament and of the Council of 21st May 2008, sets legally-binding Europe-wide limit values for the protection of public health and sensitive habitats. The Directive streamlines the European Union's air quality legislation by replacing four of the five existing Air Quality Directives within a single, integrated instrument.

The pollutants included are sulphur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter of less than 10 micrometres (µm) in aerodynamic diameter (PM₁₀), particulate matter of less than 2.5 µm in aerodynamic diameter (PM_{2.5}), lead (Pb), carbon monoxide (CO), benzene (C₆H₆), ozone (O₃), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

Directive 2008/50/EC makes it clear that the ambient air quality standards shall not be enforced where there is no regular public access and fixed habitation:

'2. Compliance with the limit values directed at the protection of human health shall not be assessed at the following locations:

(a) any locations situated within areas where members of the public do not have access and there is no fixed habitation;

(b) in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply;

(c) on the carriageway of roads; and on the central reservations of roads except where there is normally pedestrian access to the central reservation.'

The Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2019 (SI 2019/39) were made on 8 January 2019 and came into force on exit day. The Regulations ensured that the Environmental Permitting (EP) regime in England and Wales could continue to function after Brexit.

3.2 Air Quality Strategy for England, Scotland, Wales & Northern Ireland

The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007, pursuant to the requirements of Part IV of the Environment Act 1995. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

The AQS sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems.

The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence

reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

For some pollutants there is both a long-term (annual mean) standard and a short-term standard. In the case of NO₂, the short-term standard is for a 1-hour averaging period, whereas for CO it is the 8-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants.

Table 3-1
Air Quality Strategy Objectives

Pollutant	Concentrations	Measured As
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times per year	1 hour mean
	40 µg/m ³	Annual mean

The health studies which provide the basis for the air quality standards are based on data for individuals within a population, and therefore the exposure should relate to that of an individual.

For the purposes of LAQM, regulations state that exceedances of the objectives should be assessed in relation to 'the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present'.

Examples of where the objectives should, and should not apply, are summarised in Table 3-2 below, as taken from DEFRA Guidance LAQM TG(22). This table should be considered in the context of the conclusions of various review documents such as The AQC report¹ *Relationship between the UK Air Quality Objectives and Occupational Air Quality Standards* (November 2016). In particular it is important that, when setting the objective, DEFRA took account of EPAQS's recommendations. It was also influenced by the limit value set in European Commission's First Air Quality Daughter Directive which made it clear that it only applied to 'outdoor air in the troposphere, excluding work places'. The Ambient air quality Directive is consistent with this, stating that 'Compliance with the limit values directed at the protection of human health shall not be assessed... on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply'.

¹<http://www.aqconsultants.co.uk/AQC/media/Reports/Relationship-between-the-UK-Air-Quality-Objectives-and-Occupational-Air-Quality-Standards.pdf>

As such, commercial / industrial occupiers of industrial units would therefore be outside the requirements of the air quality objectives. Occupiers of industrial units where members of the public would 'regularly be present' are however within the requirements, such as some of those mentioned in section 2.1 above.

Table 3-2
Air Quality Strategy Objectives

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 façades 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 objective would apply, together with hotels. 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.
1-hour mean	All locations where the annual mean, 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations 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 where members of the public might reasonably expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

3.3 Local Air Quality Management (LAQM)

Part IV of the Environment Act 1995 also requires local authorities to periodically Review and Assess the quality of air within their administrative area. The Reviews have to consider the present and future air quality and whether any air quality objectives prescribed in Regulations are being achieved or are likely to be achieved in the future.

Where any of the prescribed air quality objectives are not likely to be achieved the authority concerned must designate that part an Air Quality Management Area (AQMA).

For each AQMA, the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local

air quality in pursuit of the air quality objectives. Local authorities are not statutorily obliged to meet the objectives, but they must show that they are working towards them.

The Department of Environment, Food and Rural Affairs (DEFRA) has published technical guidance for use by local authorities in their Review and Assessment work. This guidance is commonly referred to as LAQM.TG(22). Full details are available on the DEFRA website.

3.4 The Habitats Directive

The 'Habitats Directive' relates to Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. The Directive establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments. Natura 2000 sites in the UK include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). One or more nationally protected sites such as SSSI may be found within Natura 2000 sites, or outside these but do not themselves fall within the Natura 2000 network and are not therefore covered by the Habitats Directive unless they also fall within an SPA or SAC.

Two key sections relevant to air quality in the Directive are those found in Article 6:

'2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive .

3. Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'* [*my emphasis]

Therefore, according to the Directive, a scheme must only proceed where it does not adversely affect the integrity of one or more SAC or SPAs in view of the site's conservation objectives. This should include the potential for in-combination impacts which prevents the possibility of multiple schemes with a very small (but not negligible) impact together adversely affecting the integrity of one or more SAC or SPAs in view of the site's conservation objectives.

3.5 National Planning Policy

The latest revision of the National Planning Policy Framework (NPPF) was published in December 2023 and sets out the Government's planning policies for England and how these are expected to be applied.

The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, this NPPF recognises three overarching objectives, including the following of relevance to air quality:

“c) An environment objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigation and adapting to climate change, including moving to a low carbon economy.”

Chapter 15 (paragraph 180) of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]”

The NPPF (paragraph 192) specifically recognises air quality as part of delivering sustainable development and states 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 Air Quality Management Areas and Clean Air Zones, 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 the 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 Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.”

The site will require a Permit regulated by the Environment Agency. NPPF paragraph 194 states the following in relation to the relationship between the two regimes:

194. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

3.6 Havant Council Policies

Relevant HBC planning Policy includes:

- Havant Borough Council Borough Design Guide SPD December 2011
- Havant Borough Council Parking SPD July 2016

The Havant Borough Local Plan (Core Strategy) March 2011 is the main Policy document of relevance to potential air quality impacts. Policies relevant to this assessment include:

CS11 (Protecting and Enhancing the Special Environment and Heritage of Havant Borough):

'Planning permission will be granted for development that:

...

2. Protects and where possible enhances the borough's statutory and non-statutory designated landscape, habitats and features of biological, hydrological or geological interest. Protection and enhancement will be achieved by appropriate adaptation and mitigation measures including wardening, education and information and the creation of new habitats, water bodies/courses planting of new trees and woodland.

3. Has particular regard to the following hierarchy of nature conservation designations within the borough (as identified on the Proposals Map):

(i) Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar [International].

(ii) Sites of Special Scientific Interest (SSSI) and National Nature Reserves [National].

(iii) Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), other Ancient Woodland not identified in (ii) above [Local].

...'

DM10 Pollution:

'Development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants will only be permitted where all of the following relevant criteria can be met:

- 1. The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk.*
- 2. National air quality standards or objectives would not be breached.*
- 3. The water environment would not be detrimentally affected.*
- 4. It would not lead to an unacceptable deterioration in the quality or potential yield of coastal, surface and ground water resources.*

5. External lighting is of the minimum level of illumination and duration required for security and operational purposes.

6. External lighting would not interfere with safe navigation in either Chichester or Langstone Harbours and other coastal locations.'

A detailed review of planning policy is outside the scope of this report.



4.0 ASSESSMENT METHODOLOGY

The scope of the impact assessment for stack emissions from the proposed plant has been determined in the following way:

- review of air quality data for the area surrounding the Site, including data from the Defra Air Quality Information Resource (UK-AIR) and the Air Pollution Information System (APIS);
- desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- review of emission parameters for the power plant and dispersion modelling using the Breeze AERMOD 11 dispersion model to predict ground-level concentrations of pollutants at sensitive human and habitat receptor locations.

Manufacturer emission limits have been assumed for the purposes of the modelling assessment and each engine is assumed to be operating at full load for 3000 hours in the year.

The input parameters used in the assessment are identified in Appendix A.

4.1 Local Meteorological Data

The dispersion modelling has been carried out using five years (2018-2022) of hourly sequential meteorological data in order to take account of inter-annual variability and reduce the effect of any atypical conditions. Data from the Thorney Island meteorological station, has been used for the assessment. This site is the most representative data currently available for the area which provides the level of completeness required for dispersion modelling (i.e. minimal missing data) and was used in the air quality assessment for approved application APP/21/00809.

The meteorological data has been prepared based on a surface roughness of 0.5m with the Albedo / Bowen is characterised as urban (100%). The surface roughness is consistent with that used in the air quality assessment for approved application APP/21/00809.

A windrose for all years of meteorological data are presented in Appendix B.

4.2 Topography

The presence of elevated terrain can significantly affect the dispersion of pollutants and the resulting ground level concentration in a number of ways. Elevated terrain reduces the distance between the plume centre line and the ground level, thereby increasing ground level concentrations. Elevated terrain can also increase turbulence and, hence, plume mixing with the effect of increasing concentrations near to a source and reducing concentrations further away.

The power plant building will lie at a basal elevation of around 2m AoD. Topography has been incorporated within the dispersion model.

AERMOD utilises digital elevation data to determine the impact of topography on dispersion from a source. Topographical data for the site has been obtained in OS digital (.ntf) format. Data was processed by the AERMAP function within AERMOD to calculate terrain heights, and interpolate data to calculate terrain heights for sources, buildings etc.

4.3 Building Downwash / Entrainment

The presence of buildings close to emission sources can significantly affect the dispersion of pollutants by leading to downwash. This occurs when a building distorts the wind flow, creating zones of increased turbulence. Increased turbulence causes the plume to come to ground earlier than otherwise would be the case and result in higher ground level concentrations closer to the stack.

Downwash effects are only significant where building heights are greater than 40% of the emission release height. The downwash structures also need to be sufficiently close for their influence to be significant.

The engine containers are 4.74m in height and have been included in the dispersion model to account for potential downwash effects.

4.4 Nitrogen Oxides to NO₂ Conversion

Oxides of nitrogen (NO_x) emitted to atmosphere as a result of combustion will consist largely of nitric oxide (NO), a relatively innocuous substance. Once released into the atmosphere, NO is oxidised to NO₂. The proportion of NO converted to NO₂ depends on a number of factors including wind speed, distance from the source, solar irradiation and the availability of oxidants, such as ozone (O₃).

A conversion ratio of 70% NO_x:NO₂ has been assumed for comparison of predicted concentrations with the long-term objectives for NO₂. A conversion ratio of 35% has been utilised for the assessment of short-term impacts, as recommended by Environment Agency guidance².

4.5 Sensitive Human Health Receptors

The term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes as a consequence of the proposed power plant. As described in section 3.2 of this report, annual objectives only apply at residences.

A selection of the closest receptors to the development which have been used for modelling purposes are shown in Tables 4.1 – 4.2 and are also shown on Drawings AQ1 and ECO1. It is recognised that this list is not exhaustive, however these receptors have been selected in order to provide an indication of impacts in all directions from the proposed plant. All receptors are with that used in the air quality assessment for approved application APP/21/00809.

² AQMAU, Conversion Rates for NO_x and NO₂.

Table 4-1 shows the locations of the modelled receptors which have been classed as potential residences.

Table 4-1
Modelled Receptors: Residential

Reference	Description	OS GR Xm	OS GR Ym	Elevation (mAoD)
D1	Mill Lane, Brockhampton	470273	106054	2.5
D2	Lower Road, Brockhampton	469945	106161	8.3
D3	Mill Lane, Brockhampton	470330	106079	2.0
D4	Brockhampton Road, Brockhampton,	470958	106118	4.0
D5	Brookmead Way, Langstone	471454	105563	3.0
D6	Havant Road, Bedhampton	469309	105643	3.7
D7	Abrams Way, Brockhampton	470818	106240	3.5
D8	Bosmere Junior School, South Street, Brockhampton	471641	106121	8.9
D9	Bulbeck Road, Brockhampton	471577	106179	8.5
D10	Rectory Road, Langstone	471733	105795	5.9

For impacts at this site, a receptor grid at 20m resolution across the model domain has also been used (1.5 stack heights). These results have been presented as impact isopleths and this allows the concentration at all locations to be seen. These predicted ground level concentrations may then be compared with relevant long term and short term air quality standards and guidelines for the protection of health.

4.6 Sensitive Habitats and Ecosystems

The presence of the following habitat sites have been assessed:

- Special Areas of Conservation (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive³;
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive⁴;
- Ramsar Sites designated under the Convention on Wetlands of International Importance⁵.
- Sites of Special Scientific Interest (SSSI); and
- Ancient Woodland.

Where sensitive ecological receptors are present, maximum predicted ground level concentrations of NOx are compared with relevant critical levels, thresholds of airborne

³ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

⁴ Council Directive 79/409/EEC on the conservation of wild birds.

⁵ Ramsar (1971), The Convention of Wetlands of International Importance especially as Waterfowl Habitat.

pollutant concentrations above which damage may be sustained to sensitive plants and animals. The development is not a significant source of SO₂ or HCL / HF.

Environment Agency guidance states that *“the critical levels should be applied at all locations as a matter of policy, as they represent a standard against which to judge ecological harm”*.

Critical loads refer to the threshold beyond which deposition of pollutants to water or land results in measurable damage to vegetation and habitats. The maximum predicted deposition rates are compared with site specific critical loads obtained from APIS.

MAGIC searches for areas 10km (European sites and SSSI) and 2km from the site (AW) are included in Appendix E. These distances are consistent with Environment Agency Guidance for standby generation. The receptors modelled are shown in table 4-2 below and shown on Drawing ECO1. All ecological receptors are with that used in the air quality assessment for approved application APP/21/00809.

Table 4-2
Modelled Receptors: Ecological

Reference	Description	OS GR Xm	OS GR Ym	Elevation (mAoD)
ER1	Ancient Woodland	469532.0	106992.0	27.8
ER2	Chichester and Langstone Harbours Ramsar/SPA, Farlington Marshes LNR	468990.0	105431.0	2.7
ER3	Chichester and Langstone Harbours Ramsar/SPA, Solent Maritime SAC	470389.0	105382.0	0.1
ER4	Chichester and Langstone Harbours Ramsar/SPA	471184.0	105177.0	2.0
ER5	Chichester and Langstone Harbours Ramsar/SPA, Solent Maritime SAC	472097.0	105106.0	0.2
ER6	Portsmouth Harbour Ramsar/SPA	465249.0	104568.0	1.3
ER7	Perennial vegetation of stony banks feature of Chichester and Langstone Ramsar/SPA	468508.0	104709.0	2.0
ER8	Atlantic salt meadows (coastal saltmarsh) feature of Solent Maritime SAC	469191.0	105314.0	0.4
ER9	H130 Candidate site	470386.0	105686.0	0.8
ER10	H130 Candidate site	470368.0	105726.0	0.7
ER11	H130 Candidate site	470611.0	105632.0	0.6
ER12	H130 Candidate site	470667.0	105678.0	0.7
ER13	H130 Candidate site	470414.0	105621.0	0.7
ER14	H130 Candidate site	470432.0	105565.0	0.8
ER15	H130 Candidate site	470444.0	105512.0	0.2
ER16	H130 Candidate site	470497.0	105498.0	0.0
ER17	H130 Candidate site	470542.0	105536.0	0.4
ER18	H130 Candidate site	470576.0	105584.0	0.5
ER19	H90 Candidate site	470640.0	105222.0	0.8

Reference	Description	OS GR Xm	OS GR Ym	Elevation (mAoD)
ER20	H90 Candidate site	470657.0	105251.0	1.0
ER21	H90 Candidate site	470669.0	105275.0	1.0
ER22	H29 Candidate site	470697.0	105127.0	0.9
ER23	H29 Candidate site	470736.0	105129.0	1.0
ER24	H29 Candidate site	470759.0	105131.0	1.1
ER25	H07C Candidate site	470376.0	105641.0	0.6
ER26	H07C Candidate site	470382.0	105608.0	0.9
ER27	H07C Candidate site	470335.0	105621.0	1.0
ER28	H07C Candidate site	470389.0	105564.0	0.4
ER29	H07B Candidate site	470130.0	105535.0	1.0
ER30	H07B Candidate site	470131.0	105510.0	1.0
ER31	H07B Candidate site	470134.0	105427.0	1.0
ER32	H07B Candidate site	470105.0	105471.0	1.0
ER33	H08 Candidate site	470086.0	105757.0	2.0
ER34	H08 Candidate site	470132.0	105736.0	1.4
ER35	H08 Candidate site	470152.0	105712.0	1.0
ER36	H08 Candidate site	470162.0	105662.0	1.0
ER37	H08 Candidate site	470161.0	105620.0	1.0
ER38	H08 Candidate site	470140.0	105577.0	1.0
ER39	H07A Candidate site	469910.0	105532.0	1.0
ER40	H07A Candidate site	469838.0	105609.0	2.0
ER41	H07A Candidate site	469862.0	105565.0	1.3
ER42	H09 Candidate site	470566.0	105896.0	2.0
ER43	H09 Candidate site	470558.0	105937.0	2.0
ER44	H09 Candidate site	470505.0	105956.0	2.0
ER45	H09 Candidate site	470452.0	105942.0	2.0
ER46	H28 Candidate site	470922.0	105148.0	1.0
ER47	H28 Candidate site	470928.0	105176.0	1.0
ER48	H28 Candidate site	470941.0	105194.0	1.0
ER49	H28 Candidate site	470967.0	105196.0	1.0
ER50	H09 Candidate Site	470429.9	105853.1	2.0
ER51	H130 Candidate Site	470635.2	105666.2	0.5
ER52	H07C Low Use Site	470372.4	105637.5	0.7
ER53	H07A Core Area	469922.7	105533.8	1.0
ER54	H90 Primary Support Area	470726.6	105268.9	1.0

The locations listed as 'candidate sites' are actually gradings for overwintering site for geese. The officer report for application Ref: APP/21/00809 includes a response from the Council ecology team as follows:

'To clarify (although this does not affect the overall assessment): the various sites listed within the Solent Waders & Brent Goose Strategy (SWBGS) are not 'candidate'

sites but rather each is graded according to its importance to overwintering SPA bird species (Core site, Primary, Secondary etc.). In line with Natural England guidance, these non-SPA sites are treated as functionally linked land and therefore analogous to the SPA in terms of their function to SPA qualifying species: in this case bird species. Their treatment as 'seasonal' SPA habitat is to ensure that impacts arising from development related impacts are considered fully. I acknowledge that many SWBGS sites comprise improved grassland, often of amenity value, and as such are not analogous with the often highly sensitive vegetation communities found within European sites such as SPAs and SACs. I am unsure whether SWBGS sites should be assessed within HRA as, in the context of AQ impacts, equivalent to locally designated sites or should be treated as an extension of SPA habitat – this is something that LPAs need clarification on from Natural England.'

The isopleths included in the appendices to this report allow the impact to be seen in relation to any ecological sites of local interest which have not been specifically mentioned in this report.

A summary of critical levels for the protection of sensitive ecosystems and vegetation is presented in Appendix C.

4.7 Significance of Impact

The significance of impact from the generation plant at the Havant facility has been considered against criteria for both planning and also permitting criteria issued by the Environment Agency.

4.7.1 Planning

The EPUK Guidance describes that:

'Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. This is the primary requirement of the EIA regulations, but is also relevant to other air quality assessments.

It is important to distinguish between the meaning of 'impact' and 'effect' in this context. An impact is the change in the concentration of an air pollutant, as experienced by a receptor.

This may have an effect on the health of a human receptor, depending on the severity of the impact and other factors that may need to be taken into account. Judging the severity of an impact is generally easier than judging the significance of an effect.'

In determining impact significance from the pollutants discharged to air, specific reference has been made to Table 6.3 of "Development Control: Planning for Air Quality", which presents descriptors for impact magnitude and impact significance. These descriptors are reproduced below and relate to annual average impacts.

4-1: EPUK Impact descriptors for individual receptors

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

The following standard terminology has been applied:

- Substantial beneficial;
- Moderate beneficial;
- Minor beneficial;
- Neutral/negligible;
- Minor adverse;
- Moderate adverse; and
- Substantial adverse.

In relation to short-term impacts, the EPUK guidance states:

'6.38 Where such peak short term concentrations from an elevated source are in the range 10-20% of the relevant AQAL, then their magnitude can be described as small, those in the range 20-50% medium and those above 50% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to reference background or baseline concentrations. That is not to say that background concentrations are unimportant, but they will, on an annual average basis, be a much smaller quantity than the peak concentration caused by a substantial plume and it is the contribution that is used as a measure of the impact, not the overall concentration at a receptor. This approach is intended to be a streamlined and pragmatic assessment procedure that avoids undue complexity.'

Therefore, the following descriptors for impact magnitude resulting from short term impacts are applied in this assessment:

- <10%: Negligible;
- 10-20%: Small;
- 20-50%: Medium; and
- >50 Large.

The EPUK guidance also states that:

'judgement of the significance should be made by a competent professional who is suitably qualified. The reasons for reaching the conclusions should be transparent and set out logically.'

An impact which results in an exceedance of an air quality objective will normally be regarded as 'significant'.

4.7.2 Permitting

The EA impact, effect and significance criteria are as detailed below.

Stage 1

The EA Guidance describes that, to screen out a PC for any substance so that no further assessment is needed for that pollutant, the PC must meet both of the following criteria:

- the short-term PC is less than 10% of the short-term environmental standard;
- the long-term PC is less than 1% of the long-term environmental standard

If both of these criteria are met no further assessment of the substance is required. There will be a need to carry out a second stage of screening to determine the impact of the PEC if the criteria are not met.

Stage 2

The EA Guidance describes that, in the second stage of screening if both of the following requirements are met there is no requirement for any further assessment of that substance. Detailed modelling will be required for emissions that don't meet both of the following requirements:

- the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration; and
- the long-term PEC is less than 70% of the long-term environmental standards

The guidance then states that no further action is needed if the assessment has shown that both of the following apply:

- emissions comply with BAT associated emission levels (AELs) or the equivalent requirements where there is no BAT AEL; and
- the resulting PECs are not predicted to exceed environmental standards

A cost benefit analysis is required if any of the following apply:

- PCs could cause a PEC to exceed an environmental standard (unless the PC is very small compared to other contributors);
- the PEC is already exceeding an environmental standard;
- the activity or part of it isn't covered by a 'BAT reference document' (BREF);
- the emissions from the facility don't comply with BAT AELs; or

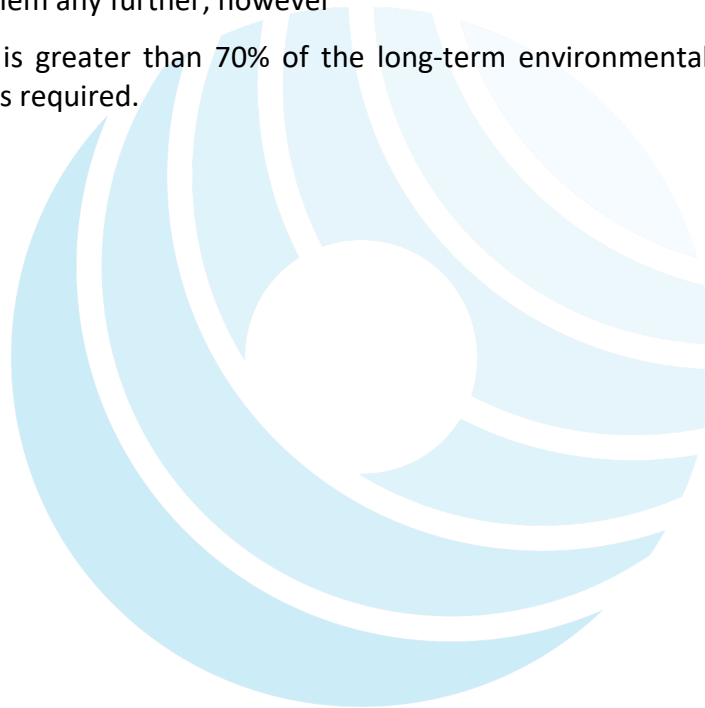
- a BAT assessment has been requested.

If the emissions from the facility that affect ecological sites meet both of the following criteria, they are insignificant:

- the short-term 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 protected conservation areas

If these requirements are not met there is a need to calculate the PEC and check the PEC against the standard for protected conservation areas.

- If your long-term PC is greater than 1% and the PEC is less than 70% of the long-term environmental standard, the emissions are insignificant and there is no requirement to assess them any further; however
- If the PEC is greater than 70% of the long-term environmental standard, detailed modelling is required.



5.0 BASELINE CONDITIONS

5.1 Council Review and Assessment of Air Quality

The HBC Combined 2022 and 2023 Air Quality Annual Status Report (ASR), June 2023 states that:

'Air quality within the Havant area is generally good. This Annual Status Report shows that the air quality objectives are likely to be achieved for NO₂ at relevant locations throughout the Borough, with many residential areas likely to enjoy excellent air quality. However, concentrations may be locally elevated in areas close to congested road junctions, or where topographic features adversely affect dispersion.

...

There were no exceedances of annual mean NO₂ concentrations identified in 2021 and 2022. There is a general decreasing trend in annual mean NO₂ concentrations over the past five years. Figures have slightly risen since 2020, due to the easing of Covid-19 lockdown restrictions. However, these figures are lower than pre-pandemic 2019 NO₂ concentrations at all the diffusion tube locations.'

The proposed development site is therefore not located within an AQMA.

5.2 Local Monitoring Data

HBC did not undertake automatic (continuous) monitoring during 2021 and 2022. However, the council did undertake non-automatic monitoring of NO₂ at 23 sites during 2021 and 2022.

There is no recent Council monitoring data which is directly relevant to the site location, the closest being at the A27 / A3023 / B2149 Junction. The 2022 annual average NO₂ concentrations at those locations were:

- Site 2: 18.5 µg/m³;
- Site 12: 22.6 µg/m³;
- Site 19C: 28.4 µg/m³; and
- Site 20: 19.1 µg/m³.

All results were well below the annual objective of 40 µg/m³.

5.3 DEFRA Background Maps

Information on background concentrations in the vicinity of the site has been obtained from the DEFRA background pollutant maps. Background concentrations from the grid square which represents the site for the current year of 2024 are shown in Table 5-1 below.

- NO_x: 24.9µg/m³; and
- NO₂: 17.5µg/m³.

Estimated DEFRA background concentrations are therefore 'well below' the relevant objectives and broadly consistent with HBC monitoring results for Site 2 and Site 20.

5.4 Backgrounds: Ecological Receptors

The 2019-2021 NO_x background given by APIS for the site is similar to the DEFRA background for this grid square, at 25.9 µg/m³. The difference is likely to reflect the 4 years between the base years for the data sources but is not materially different.

In terms of nutrient Nitrogen critical load, the average background 11.9 Kg N/ha/year for low lying vegetation.



6.0 PREDICTED IMPACTS

The assessment results are presented in the tables below.

6.1 All Locations

The predicted process contribution (PC) at the maximum point of impact (offsite) is presented in Table 6.1 for short term limits. The annual objective does not apply at the point of maximum ground level concentration except where a residence is present.

Table 6-1
Maximum Predicted Ground Level Concentrations

Pollutant	Averaging Period	EAL ($\mu\text{g}/\text{m}^3$)	PC ($\mu\text{g}/\text{m}^3$)	PC (%age of EAL)
NO ₂	1-hour	200	54.0	27%

[*18th Highest value of operational period, equating to 99.79th percentile of entire year.]

The results show that the process contribution for short term NO₂ is below the relevant objective at this point of maximum impact. As can be seen in the impact drawings, these maximum levels do not occur at a location where members of the public would regularly be present.

The potentially significant long-term and short-term impacts are compared with the baseline concentrations (i.e. PC + Baseline, or Predicted Environmental Concentration, 'PEC') for the power generation plant in Table 6.2.

Table 6-2
Comparison of Predictions with Baseline Concentrations

Pollutant	EAL	Baseline	PEC	PEC (%age of EAL)
NO ₂	200	35.1	89.0	45%

In terms of impact at the point of maximum Ground Level Concentration (GLC) the magnitude of change in 1-hour NO₂ impact is 'medium'. However, this location is not a location '*where members of the public have regular access*', i.e. it is not likely that a member of the public would be at this location for 18 hours or more per year.

6.2 Discrete Receptors: Residential

The predicted process contribution (PC) and predicted environmental concentration (PEC) at the assessed receptor locations, where members of the public would reasonably be expected to spend time, is presented in Table 6.3.

Table 6-3
Residential Receptor Impact Concentrations ($\mu\text{g}/\text{m}^3$)

Receptor	PC Annual NO ₂	PEC Annual NO ₂	PC 1-hr NO ₂	PEC 1-hr NO ₂
D1	0.28	17.8	11.7	46.8
D2	0.11	17.6	6.0	41.0
D3	0.31	17.8	12.1	47.2
D4	0.81	18.3	13.9	49.0
D5	0.23	17.8	6.6	41.7
D6	0.09	17.6	4.1	39.1
D7	0.62	18.2	12.4	47.5
D8	0.21	17.7	5.1	40.1
D9	0.23	17.8	5.3	40.4
D10	0.18	17.7	4.9	40.0

Maximum predicted impacts can be seen in Appendix D. The highest long term NO₂ impact at an assessed residential receptor is predicted to fall at D4 (Brockhampton Road, Brockhampton) which represents 2% of the annual objective and is therefore negligible, the overall PEC being less than 46% of the objective. The highest hourly NO₂ impact at an assessed residential receptor is also predicted to fall at receptor D4 which is 7% of the short term objective and therefore negligible.

6.3 Discrete Receptors: Ecological

6.3.1 Critical Levels PC

The NO_x critical level PC impacts at all locations (annual and 24-hour) can be seen below.

Table 6-4
Ecological Receptors: Critical Levels ($\mu\text{g}/\text{m}^3$)

Receptor	PC Annual NO _x	Annual NO _x % of limit	PC 24-hr NO _x	24-hr NO _x % of limit
ER1	b	0.1%	1.1	1.4%
ER2	0.11	0.4%	1.3	1.8%
ER3	0.57	1.9%	7.5	9.9%
ER4	0.23	0.8%	2.9	3.8%
ER5	0.14	0.5%	1.7	2.2%
ER6	0.02	0.1%	0.4	0.5%
ER7	0.09	0.3%	0.9	1.3%
ER8	0.14	0.5%	1.8	2.4%
ER9	1.39	4.6%	16.8	22.4%
ER10	1.27	4.2%	17.3	23.0%
ER11	1.06	3.5%	18.5	24.6%
ER12	0.98	3.3%	23.3	31.1%
ER13	1.30	4.3%	14.3	19.1%

Receptor	PC Annual NO _x	Annual NO _x % of limit	PC 24-hr NO _x	24-hr NO _x % of limit
ER14	1.08	3.6%	11.6	15.4%
ER15	0.88	2.9%	11.3	15.1%
ER16	0.82	2.7%	12.1	16.2%
ER17	0.89	3.0%	13.4	17.8%
ER18	1.00	3.3%	14.9	19.8%
ER19	0.31	1.0%	4.2	5.6%
ER20	0.32	1.1%	4.3	5.7%
ER21	0.33	1.1%	4.3	5.8%
ER22	0.24	0.8%	3.3	4.4%
ER23	0.23	0.8%	3.1	4.1%
ER24	0.23	0.8%	3.0	4.0%
ER25	1.24	4.1%	15.1	20.2%
ER26	1.17	3.9%	13.4	17.9%
ER27	1.07	3.6%	12.8	17.1%
ER28	1.03	3.4%	10.1	13.5%
ER29	0.57	1.9%	6.4	8.5%
ER30	0.56	1.9%	6.0	8.0%
ER31	0.50	1.7%	5.7	7.6%
ER32	0.51	1.7%	5.7	7.5%
ER33	0.45	1.5%	6.6	8.8%
ER34	0.53	1.8%	6.8	9.0%
ER35	0.58	1.9%	7.2	9.7%
ER36	0.63	2.1%	8.5	11.3%
ER37	0.64	2.1%	8.3	11.1%
ER38	0.60	2.0%	7.4	9.9%
ER39	0.36	1.2%	5.0	6.7%
ER40	0.30	1.0%	4.0	5.4%
ER41	0.32	1.1%	4.5	6.1%
ER42	1.06	3.5%	29.7	39.7%
ER43	1.43	4.8%	27.6	36.8%
ER44	1.15	3.8%	24.4	32.6%
ER45	0.98	3.3%	16.3	21.8%
ER46	0.22	0.7%	3.8	5.1%
ER47	0.23	0.8%	4.1	5.5%
ER48	0.24	0.8%	4.3	5.7%
ER49	0.24	0.8%	4.3	5.7%
ER50	1.12	3.7%	18.8	25.0%
ER51	1.04	3.5%	21.5	28.6%
ER52	1.22	4.1%	14.8	19.8%
ER53	0.37	1.2%	5.1	6.9%

Receptor	PC Annual NO _x	Annual NO _x % of limit	PC 24-hr NO _x	24-hr NO _x % of limit
ER54	0.30	1.0%	4.2	5.6%

The highest annual average NO_x impact 1.43 µg/m³ which represents 4.8% of the annual average NO_x critical level. The highest 24-hour average NO_x impact is 29.7µg/m³ which represents 39.7% of the 24-hour average NO_x critical level. These are both at the H09 Candidate site.

The highest annual average NO_x impact at a European site 0.57 µg/m³ at the Chichester and Langstone Harbours Ramsar/SPA, Solent Maritime SAC which represents 1.9% of the annual average NO_x critical level. The highest 24-hour average NO_x impact within a European site is 7.5µg/m³ which represents 9.9% of the 24-hour average NO_x critical level.

The PEC is below 100% at all points on the modelling grid and therefore acceptable at any local sites and AW according to EA Guidance.

6.3.2 Critical Levels PEC

The NO_x critical level Predicted Environmental Concentration can be seen in Table 6-5, below.

Table 6-5
Ecological Receptors: Critical Level PEC (µg/m³)

Receptor	PC Annual NO _x	PEC Annual NO _x	PEC Annual NO _x % of limit
ER1	0.04	25.0	83.2%
ER2	0.11	25.0	83.4%
ER3	0.57	25.5	85.0%
ER4	0.23	25.1	83.8%
ER5	0.14	25.1	83.5%
ER6	0.02	24.9	83.1%
ER7	0.09	25.0	83.3%
ER8	0.14	25.1	83.5%
ER9	1.39	26.3	87.7%
ER10	1.27	26.2	87.3%
ER11	1.06	26.0	86.6%
ER12	0.98	25.9	86.3%
ER13	1.30	26.2	87.4%
ER14	1.08	26.0	86.6%
ER15	0.88	25.8	86.0%
ER16	0.82	25.7	85.8%
ER17	0.89	25.8	86.0%
ER18	1.00	25.9	86.4%
ER19	0.31	25.2	84.1%
ER20	0.32	25.2	84.1%
ER21	0.33	25.2	84.1%

Receptor	PC Annual NO _x	PEC Annual NO _x	PEC Annual NO _x % of limit
ER22	0.24	25.2	83.8%
ER23	0.23	25.1	83.8%
ER24	0.23	25.1	83.8%
ER25	1.24	26.2	87.2%
ER26	1.17	26.1	86.9%
ER27	1.07	26.0	86.6%
ER28	1.03	25.9	86.5%
ER29	0.57	25.5	84.9%
ER30	0.56	25.5	84.9%
ER31	0.50	25.4	84.7%
ER32	0.51	25.4	84.7%
ER33	0.45	25.4	84.5%
ER34	0.53	25.4	84.8%
ER35	0.58	25.5	85.0%
ER36	0.63	25.5	85.1%
ER37	0.64	25.6	85.2%
ER38	0.60	25.5	85.0%
ER39	0.36	25.3	84.2%
ER40	0.30	25.2	84.1%
ER41	0.32	25.2	84.1%
ER42	1.06	26.0	86.6%
ER43	1.43	26.3	87.8%
ER44	1.15	26.1	86.9%
ER45	0.98	25.9	86.3%
ER46	0.22	25.1	83.8%
ER47	0.23	25.1	83.8%
ER48	0.24	25.2	83.8%
ER49	0.24	25.2	83.8%
ER50	1.12	26.0	86.8%
ER51	1.04	26.0	86.5%
ER52	1.22	26.1	87.1%
ER53	0.37	25.3	84.3%
ER54	0.30	25.2	84.0%

The PEC is less than 100% of the limit at all sites indicating that the NO_x critical level will not be exceeded.

6.3.3 Critical Loads

In relation to critical loads, the Nutrient N impacts at all locations can be seen in Table 6-6, below.

Table 6-6
Ecological Receptors: Critical Loads

Receptor	PC	lower critical load Kg N/ha/yr	PC (% of lower critical load)
ER1	0.01	10.0	0.1%
ER2	0.03	10.0	0.3%
ER3	0.17	20.0	0.8%
ER4	0.07	20.0	0.3%
ER5	0.04	20.0	0.2%
ER6	0.01	20.0	0.0%
ER7	0.02	10.0	0.2%
ER8	0.04	20.0	0.2%
ER9	0.40	20.0	2.0%
ER10	0.37	20.0	1.8%
ER11	0.31	20.0	1.5%
ER12	0.28	10.0	2.8%
ER13	0.37	10.0	3.7%
ER14	0.31	10.0	3.1%
ER15	0.25	10.0	2.5%
ER16	0.24	10.0	2.4%
ER17	0.26	10.0	2.6%
ER18	0.29	10.0	2.9%
ER19	0.09	10.0	0.9%
ER20	0.09	10.0	0.9%
ER21	0.10	10.0	1.0%
ER22	0.07	10.0	0.7%
ER23	0.07	10.0	0.7%
ER24	0.07	10.0	0.7%
ER25	0.36	20.0	1.8%
ER26	0.34	20.0	1.7%
ER27	0.31	20.0	1.5%
ER28	0.30	10.0	3.0%
ER29	0.16	10.0	1.6%
ER30	0.16	10.0	1.6%
ER31	0.15	10.0	1.5%
ER32	0.15	10.0	1.5%
ER33	0.13	10.0	1.3%
ER34	0.15	10.0	1.5%
ER35	0.17	10.0	1.7%
ER36	0.18	10.0	1.8%
ER37	0.18	10.0	1.8%
ER38	0.17	10.0	1.7%

Receptor	PC	lower critical load Kg N/ha/yr	PC (% of lower critical load)
ER39	0.10	10.0	1.0%
ER40	0.09	10.0	0.9%
ER41	0.09	10.0	0.9%
ER42	0.30	10.0	3.0%
ER43	0.41	10.0	4.1%
ER44	0.33	10.0	3.3%
ER45	0.28	10.0	2.8%
ER46	0.06	10.0	0.6%
ER47	0.07	10.0	0.7%
ER48	0.07	10.0	0.7%
ER49	0.07	10.0	0.7%
ER50	0.32	10.0	3.2%
ER51	0.30	10.0	3.0%
ER52	0.35	10.0	3.5%
ER53	0.11	10.0	1.1%
ER54	0.09	10.0	0.9%

As the process contributions are less than 1% of the nutrient N critical load at all designated European sites therefore nutrient N impacts are insignificant at all of the assessed locations according to Environment Agency guidance. The PEC is below 100% at any local sites and AW and therefore acceptable according to EA Guidance.

6.4 Summary

In relation to the impact screening:

- Short term predictions at the point of maximum GLC cannot be considered 'insignificant';
- Long term prediction also cannot be considered 'insignificant'.

However, at locations where the hourly and / or annual objectives must be applied, levels are well below the relevant objectives.

No further mitigation is required, beyond that already in place (i.e. stack height and use of lean burn engines) and in relation to AQ there is no reason why planning consent should not be granted. Furthermore, predicted impacts have been demonstrated to be significantly lower than those for the scheme previously approved for this site, as would be expected.

6.5 Suitability for Permitting

EA Guidance 'Environmental permitting: air dispersion modelling reports' (24th May 2019) states that:

'You must include a discussion of results (what they mean and their significance) before you make your final conclusions.'

However:

'At the detailed modelling stage there are no criteria to determine whether:

- PCs are significant*
- PECs are insignificant or significant'*

In addition, Environment Agency Guidance 'Air emissions risk assessment for your environmental permit' states the following in relation to the requirements for further action, based on the results of the detailed modelling.

When you don't need to take further action

'You don't need to take further action if your assessment has shown that both of the following apply:

- your proposed emissions comply with BAT associated emission levels (AELs) or the equivalent requirements where there is no BAT AEL*
- the resulting PECs won't exceed environmental standards'*

However:

When you need to take further action. You'll need to do a cost benefit analysis if any of the following apply:

- your PCs could cause a PEC to exceed an environmental standard (unless the PC is very small compared to other contributors – if you think this is the case contact the Environment Agency)*
- the PEC is already exceeding an environmental standard*
- your activity or part of it isn't covered by a 'BAT reference document' (BREF)*
- your proposals don't comply with BAT AELs - in this case you'll need to make a request for an exception ('derogation') that includes a cost benefit analysis of your proposals*
- you've been asked to do a BAT assessment*

At locations where the hourly and / or annual objectives must be applied, levels are below the relevant NO₂ objectives. Therefore:

1. Emissions from the generators comply with BAT associated emission levels (AELs); and
2. the PCs will not cause a PEC to exceed an environmental standard at locations where the hourly and / or annual objectives must be applied; and

3. the PEC is not already exceeding an environmental standard at locations where the hourly and / or annual objectives must be applied.

For these reasons, it is acceptable for the EA to issue a Permit for this site when comparing the impacts against their assessment criteria.



7.0 EXTANT PERMISSION: COMPARISON

The site benefits from an extant permission approved under application Ref: APP/21/00809. The officer report for that application included no concerns relating to impacts on human health. It also included the following from Natural England in relation to impacts on ecology:

'For the purposes of a Habitat Regulations Assessment, Natural England advises that the 1% Critical threshold is a screening tool which should be used a guideline to initially check whether a plan or project may require an appropriate assessment. This exceedance therefore need to be formally checked and confirmed by your Authority, as the competent authority, via an appropriate assessment, in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended), in order to more precisely assess the likely effects identified and to inform a conclusion as to whether an adverse effect on site integrity can be ruled out.'

As such an HRA was required. A shadow HRA was prepared by the applicant and reviewed by the Council as the 'Competent Authority':

'On this basis the Council has conducted a Habitats Regulations Assessment (HRA) of the proposed development under Regulation 63 of The Conservation of Habitats and Species Regulations 2017 (as amended). The Council's assessment as competent Authority under those regulations is included in the case file. The screening under Regulation 63(1)(a) found that, based on the applicant's submitted evidence, any effects on nitrogen deposition, air quality or acid deposition would not be significant and therefore any likely significant effects on nearby European sites (the Solent Maritime SAC and Chichester & Langstone Harbours SPA/Ramsar sites) could be screened out. This conclusion has been accepted by Natural England.'

The section below provides a comparison of the predicted impacts for approved application Ref: APP/21/00809 with the scheme now proposed. The predicted impacts at the human receptors for the extant scheme are taken from tables 5.1 and 5.2 of the air quality assessment for that scheme.

Table 7-1
Impact Comparison: Human Receptors ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Extant	Proposed	Difference
NO ₂	1-hour	56.94	45.9	-11.0
NO ₂	Annual	1.17	1.0	-0.2

It can be seen that the proposed scheme represents a betterment over that already approved.

The predicted impacts at the ecological receptors for the extant scheme are taken from tables 5.3 and 5.4 of the air quality assessment for that scheme.

Table 7-2
Impact Comparison: Ecological Receptors ($\mu\text{g}/\text{m}^3$)

Receptor	Extant	Proposed	Difference
ER1	0.0	0.0	0.0
ER2	0.1	0.1	0.0
ER3	0.5	0.6	0.1
ER4	0.2	0.2	0.0
ER5	0.1	0.1	0.0
ER6	0.0	0.0	0.0
ER7	0.1	0.1	0.0
ER8	0.1	0.1	0.0

It can be seen that the impacts for the proposed scheme are not materially different from those predicted for the already approved scheme.



8.0 CONCLUSIONS

The assessment considers air quality impacts associated with the proposed development of a small scale standby electricity generation plant (SSSEGP) peaking power plant at their land at Hermitage Park, Harts Farm Way, Havant (Drawing AQ1). The site, also referred to as 'Havant' lies within the administrative area of Havant Borough Council (HBC).

Detailed air quality modelling using the AERMOD 11 dispersion model has been undertaken to predict the impacts associated with stack emissions from the gas engines at the Site. As a worst-case, emissions from each of the stacks have been assumed to occur for 3000 hours per year when comparing against long term air quality limits and the entire year when comparing against short term limits. Actual operational hours are likely to be significantly lower.

All impacts, human and ecological, are predicted to be below limit values at locations where the Air Quality Directive states that they must be applied. When applying the theoretical worst case assumptions above (i.e. that each of the engines is operating for 3000 hours per year) it can be seen that there is no realistic potential for a breach of the air quality objectives at any location.

Similarly, the operation of the proposed facility will not be materially different from those for the scheme approved under application Ref: APP/21/00809.

In summary, it can be concluded that the predicted short term and long term PECs at the sensitive human and ecological receptors are within acceptable limits. The site is therefore unlikely to cause an exceedance of an EAL (or upper critical load / level). For these reasons, it is acceptable for the EA to issue a Permit for this site when comparing the impacts against their assessment criteria and in relation to air quality there is no reason why planning consent should not be granted.

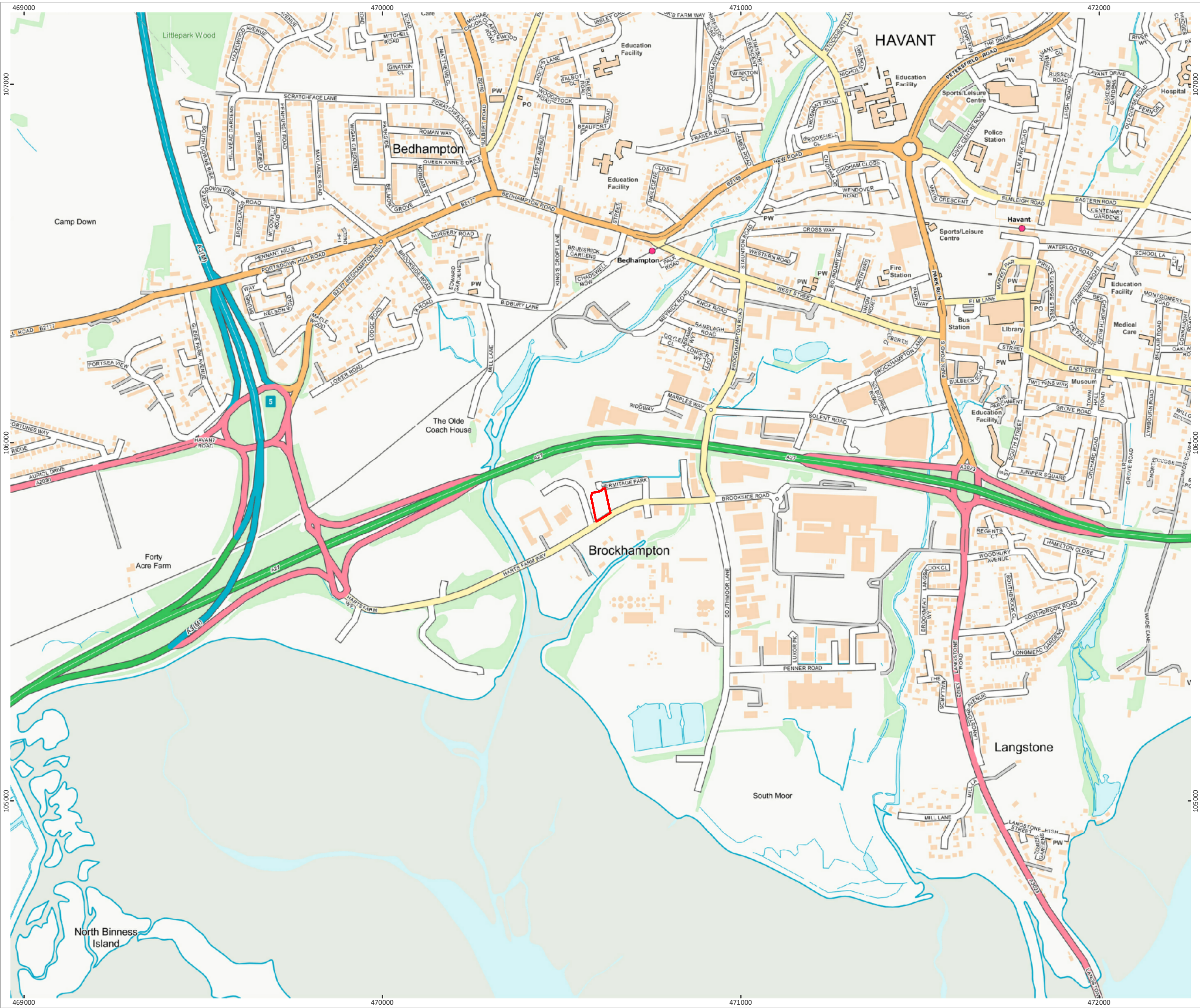
Notice:

This report was produced by Isopleth Ltd to present the results of an air quality constraints assessment for a proposed power plant at a site on land at Hermitage Park, Harts Farm Way, Havant.

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DRAWINGS AQ1 AND ECO1





Site Boundary



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FORSA ENERGY

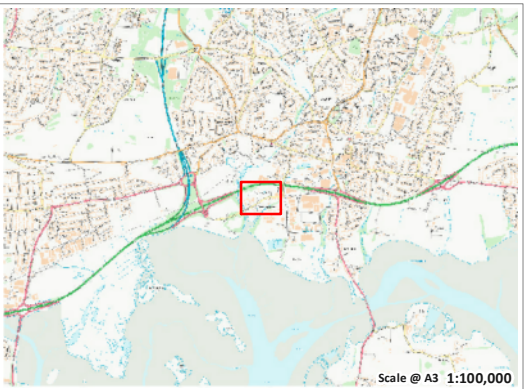
Site Location

**Gas Energy Generating Site
Harts Farm Way, Havant**

NOTE:	
Ref: FE/017/481 Date: 01/12/2022	Produced: VM Approved: RW
Scale @ A3 1:10,000	



Site Boundary



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Site Layout

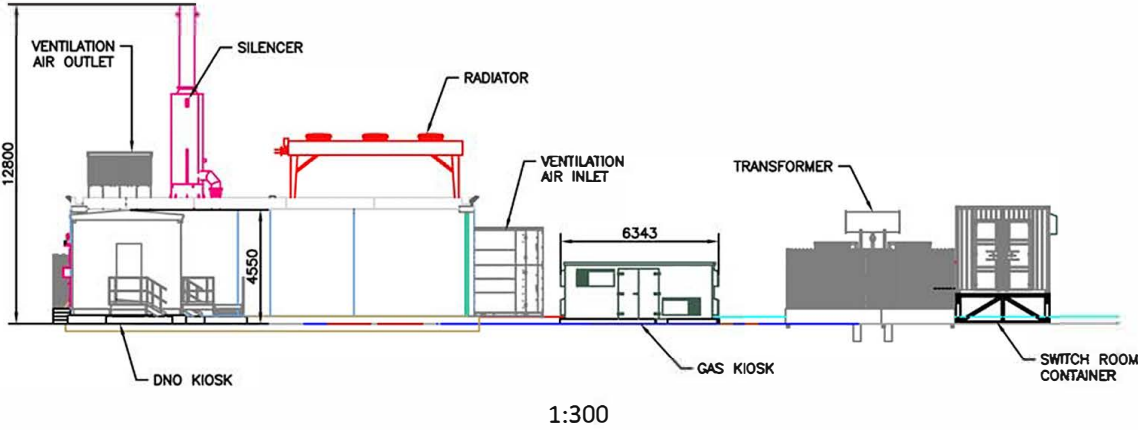
Gas Energy Generating Site
Harts Farm Way, Havant, Portsmouth

NOTE:

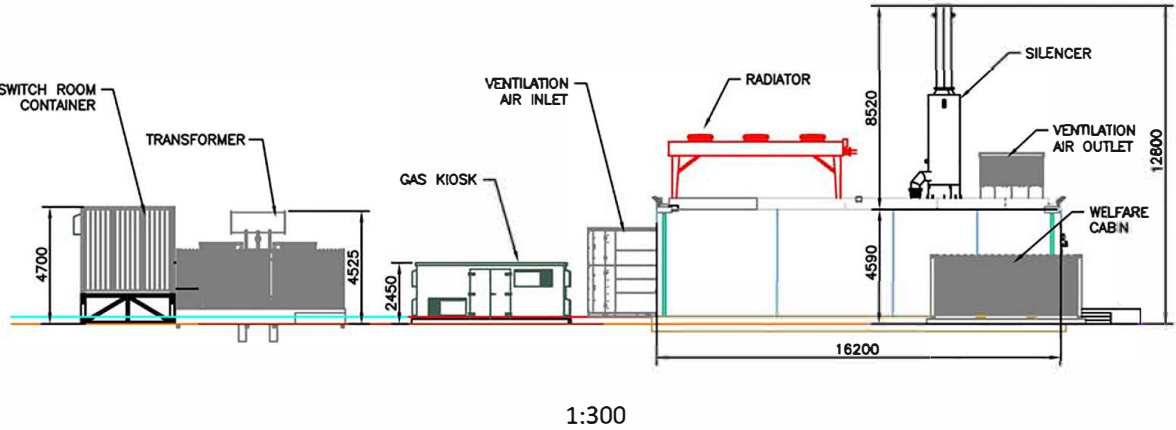
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Scale @ A3 1:500

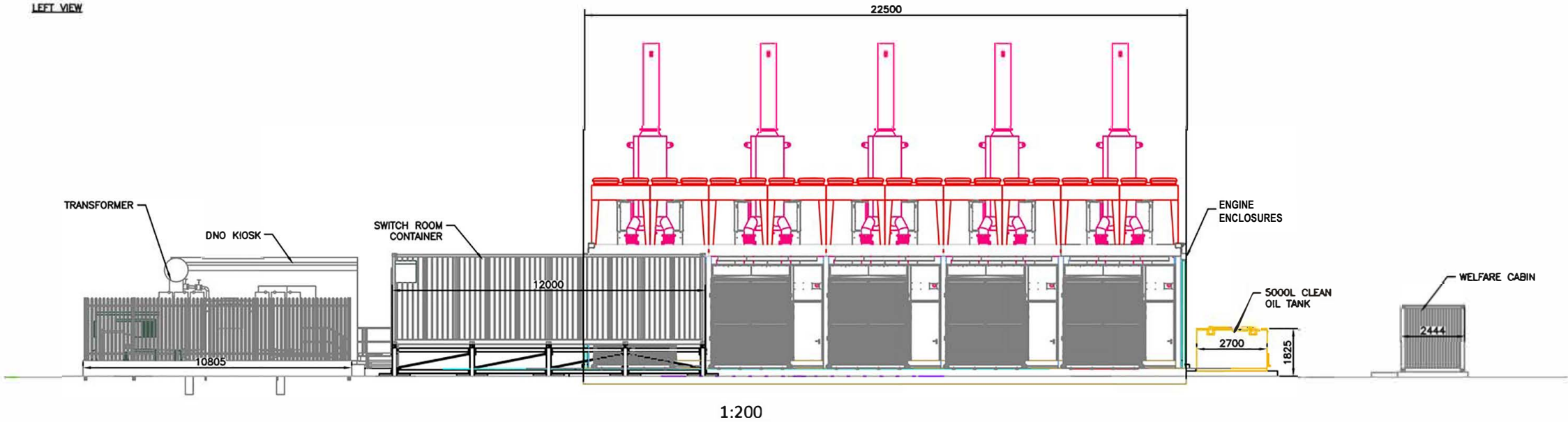
FRONT VIEW



BACK VIEW



LEFT VIEW



RIGHT VIEW



SCALE:
Scale @ A3
1:300 and 1:200

FIGURE REF: FE/017/594
DATE OF ISSUE: 18/01/24
PAPER SIZE A3
DRAWN: VM
ISSUED: RW

FIGURE
ELEVATIONS
PALISADE FENCE & GATE



PROJECT
Gas Energy Generating Site
Harts Farm Way, Havant, Portsmouth



APPENDIX A: INPUT DATA

The data for the FORSA Engines has been provided by the engine supplier.

Table A-1
Modelling Inputs

Parameter	Value	
Engine Make	Jenbacher	Jenbacher
Engine Model	J624, K12	J616, J12
No. of engines	4	1
Max hours per year	3000	3000
Engine rating (kW _e)	4499	2676
NOx concentration (mg/Nm ³)*	95	95
Exhaust Temp (K)	624	635
Actual Flow (Am ³ /s per engine)	11.96	7.85
H ₂ O (%)	10.1%	9.6%
Oxygen (wet %)	9.4%	10.0%
Oxygen (dry %)	10.5%	11.1%
Normalised Flow (Nm ³ /s per engine)	8.30	5.07
NOx mass emission (g/s) per engine	0.79	0.48
Stack Diameter (m)	0.80	0.60
Velocity of release (m/s)	23.79	27.74
Height of Stack (m)	12.80	12.80

[at 15% O₂, 0 degC, 1atm, dry]

Modelled mass emissions differ from those in the table above for the reasons given in this report, in that they have been adjusted for NO_x:NO₂ proportion in accordance with EA guidance and also hours of operation in the case of long term emissions. For example in relation to NOx from the J624, K12 Engines:

- NOx mass emission per engine = 0.79 g/s;
- Multiplied by 0.7 for NO_x:NO₂ = 0.552 g/s;
- Multiplied by (3000 / 8760) hours = 0.189 g/s (modelling input).

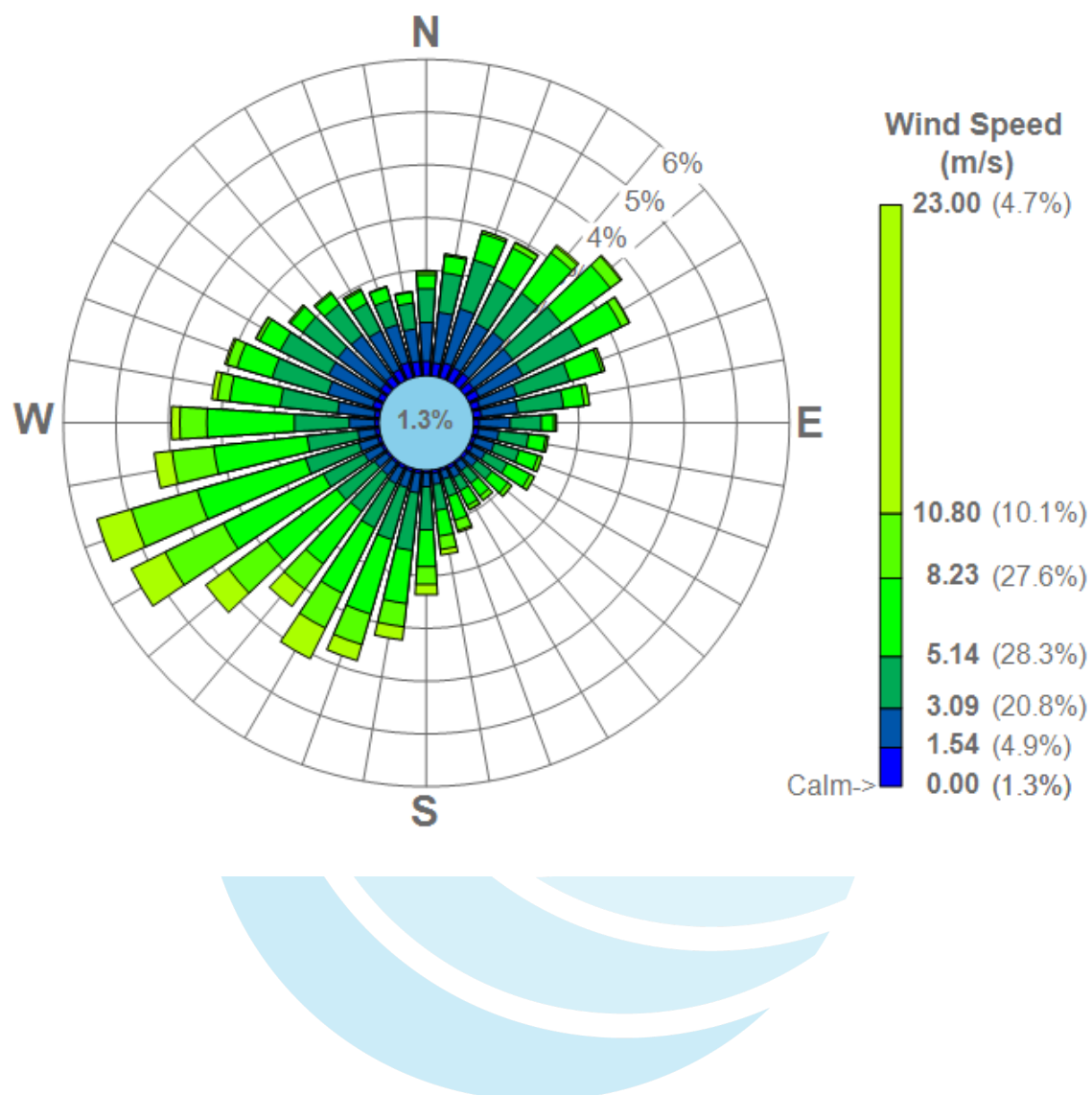
The locations of the stacks for the modelled units are shown in the table below.

Table A-2
Stack Locations

Stack	OS Xm	OS Ym
J624, K12	470618.3	105841.5
J624, K12	470619.6	105837.2
J624, K12	470620.6	105832.7
J624, K12	470621.6	105828.2
J616, J12	470622.4	105823.9



APPENDIX B: WIND DATA



APPENDIX C: AIR QUALITY LIMITS

Table C-1
Air Quality Strategy Objectives

Pollutant	Concentrations	Measured As
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times per year	1 hour mean
	40 µg/m ³	Annual mean
Nitrogen Dioxide (NO _x)	30 µg/m ³	Annual mean : Protection of Vegetation
	75 µg/m ³	24h: Protection of Vegetation



APPENDIX D: IMPACT PLOTS

Figure D1: Annual Average NO₂ impact

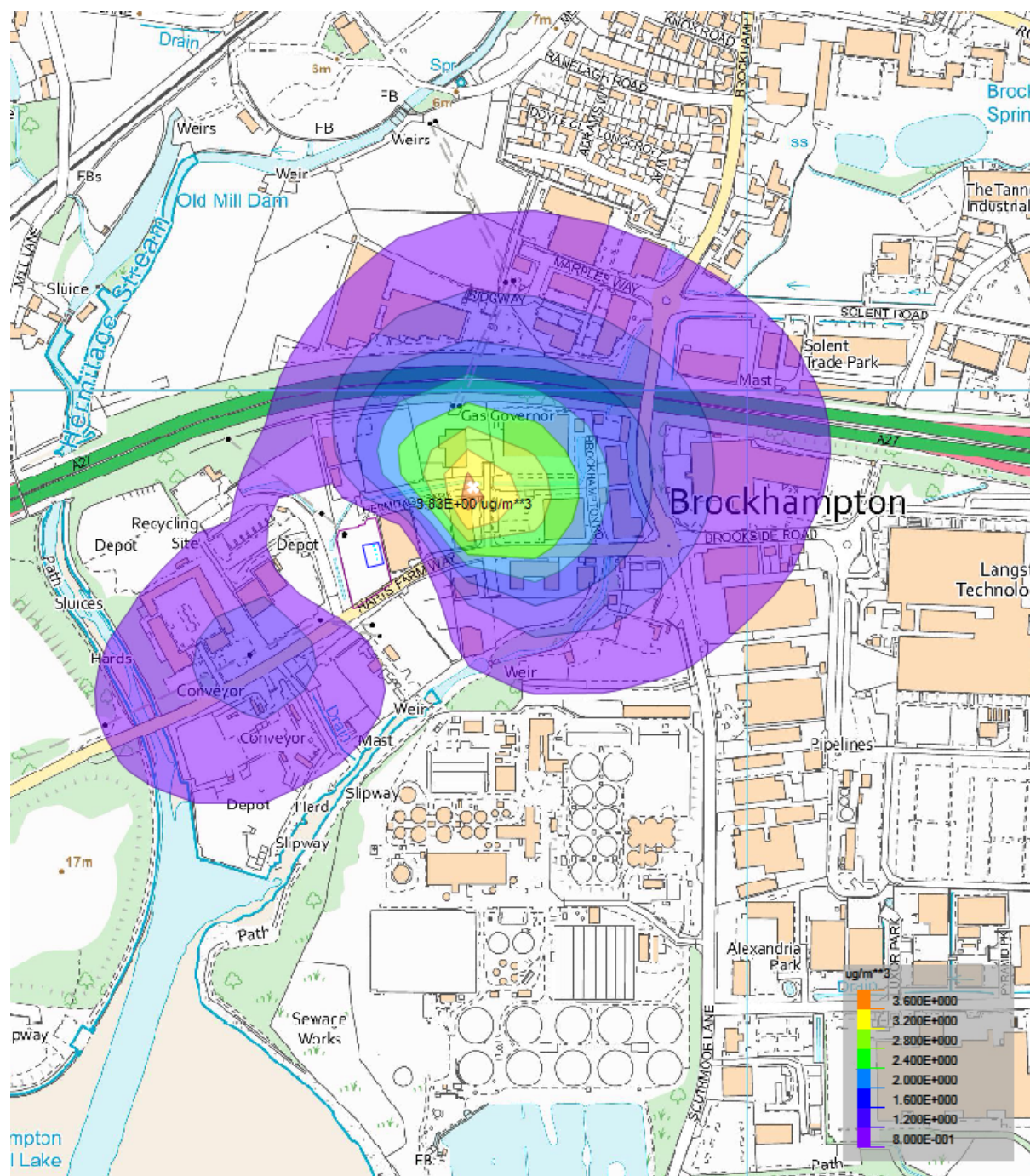


Figure D2: 1hr (99.79th percentile) NO₂ impact

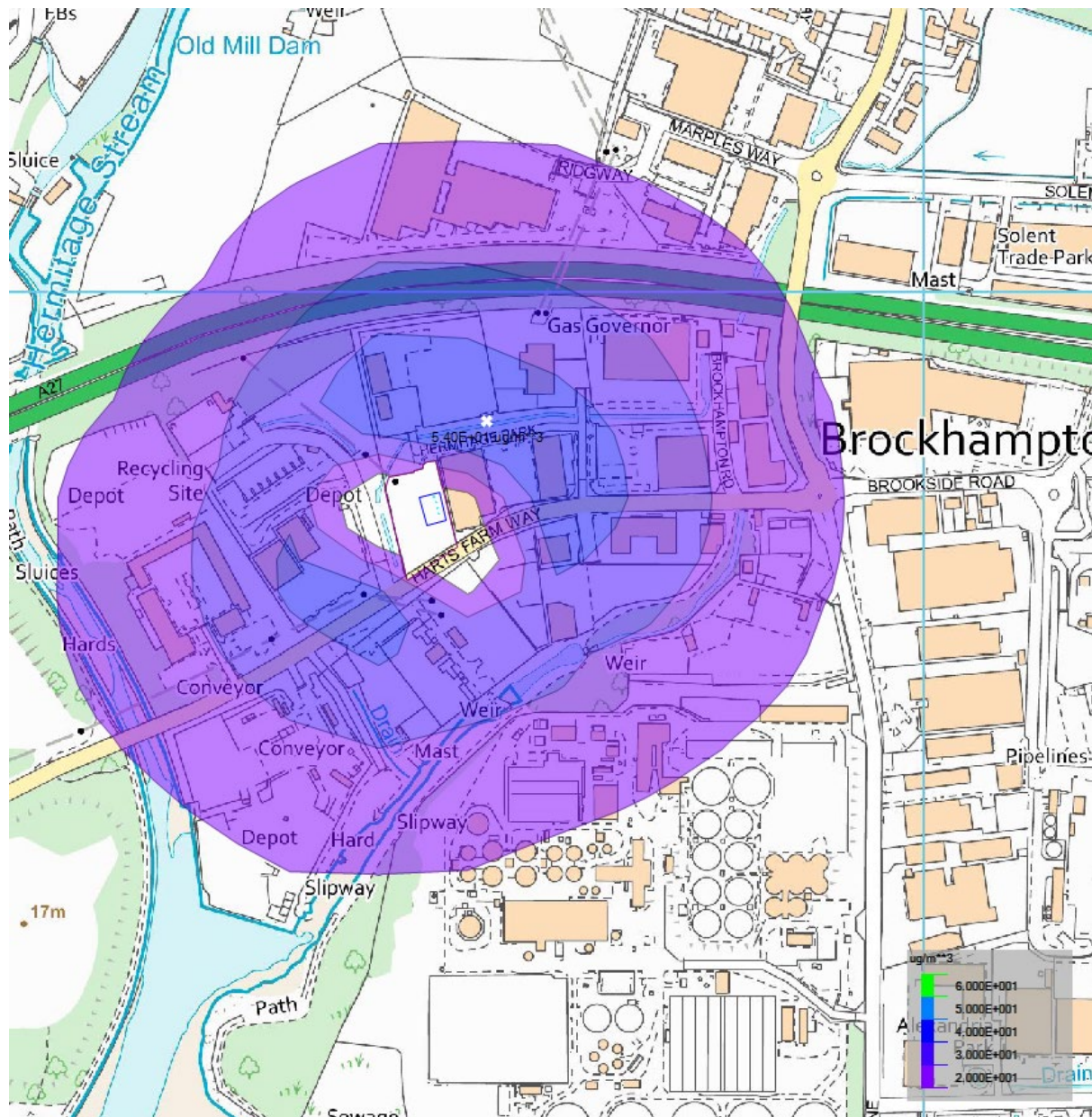


Figure D3: Annual Average NO_x impact (Ecology)

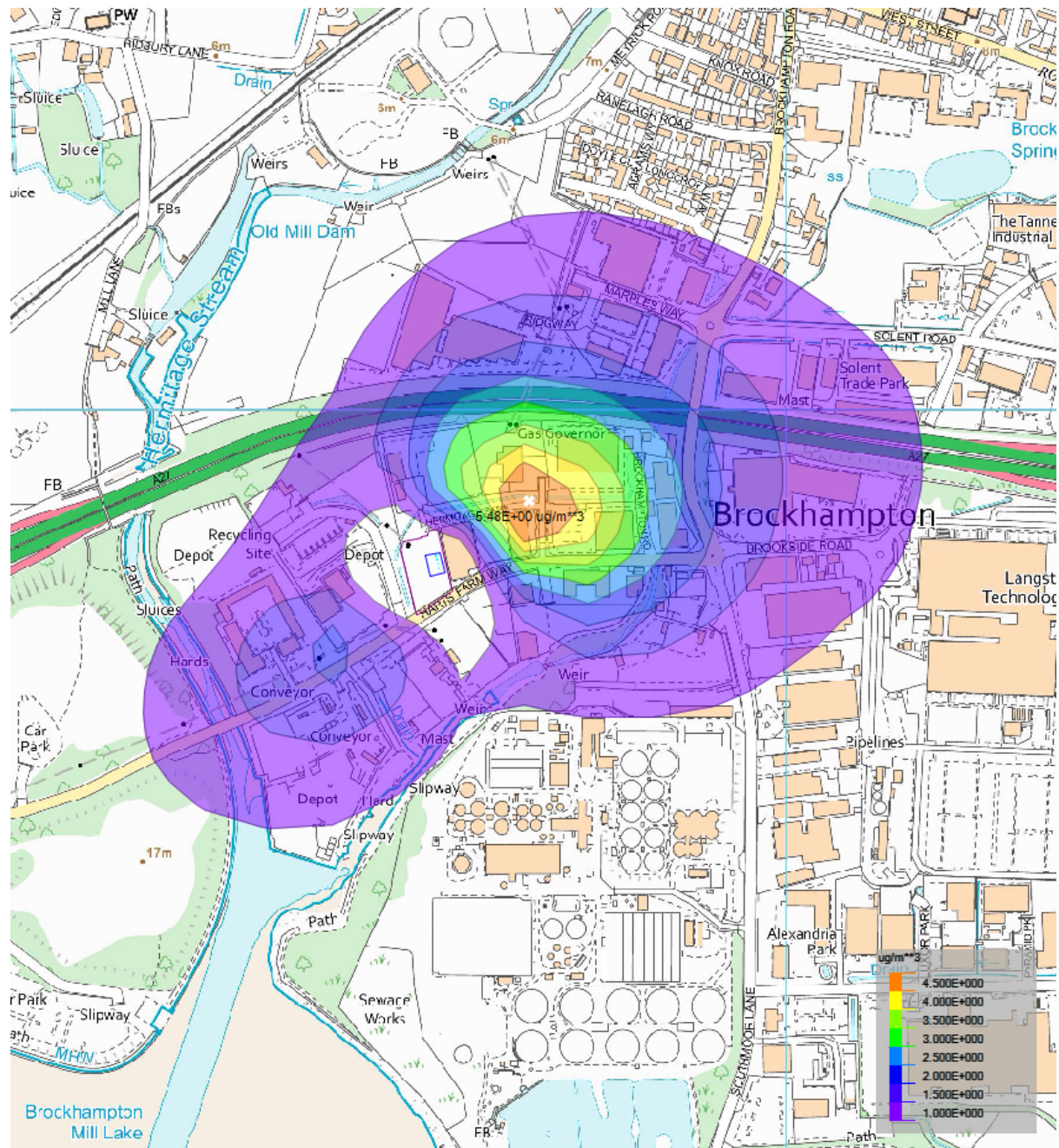
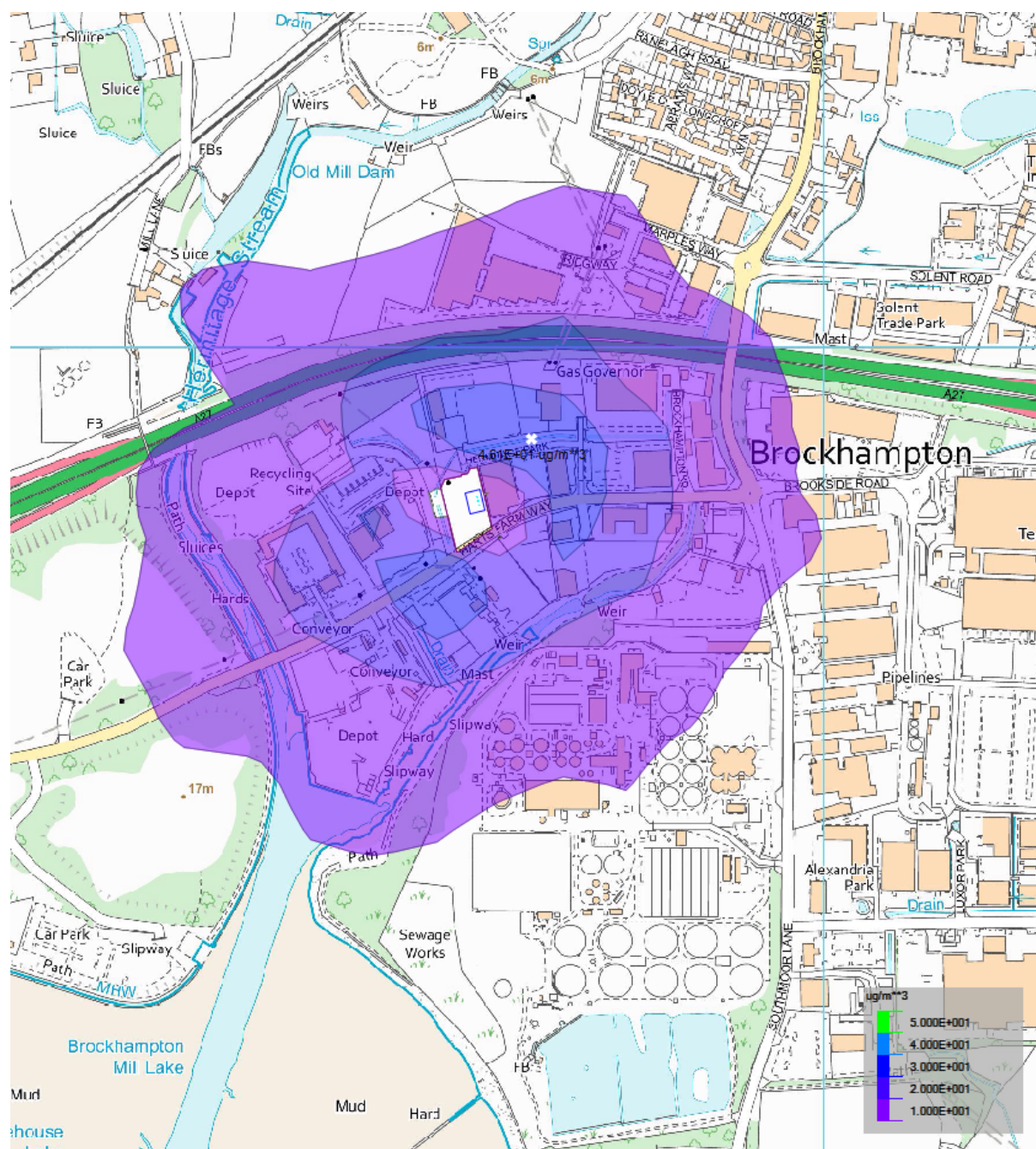


Figure D4: 24 hour Average NO_x impact (Ecology)



APPENDIX E: ECOLOGICAL SEARCHES

Figure E1: Ancient Woodlands (2km)

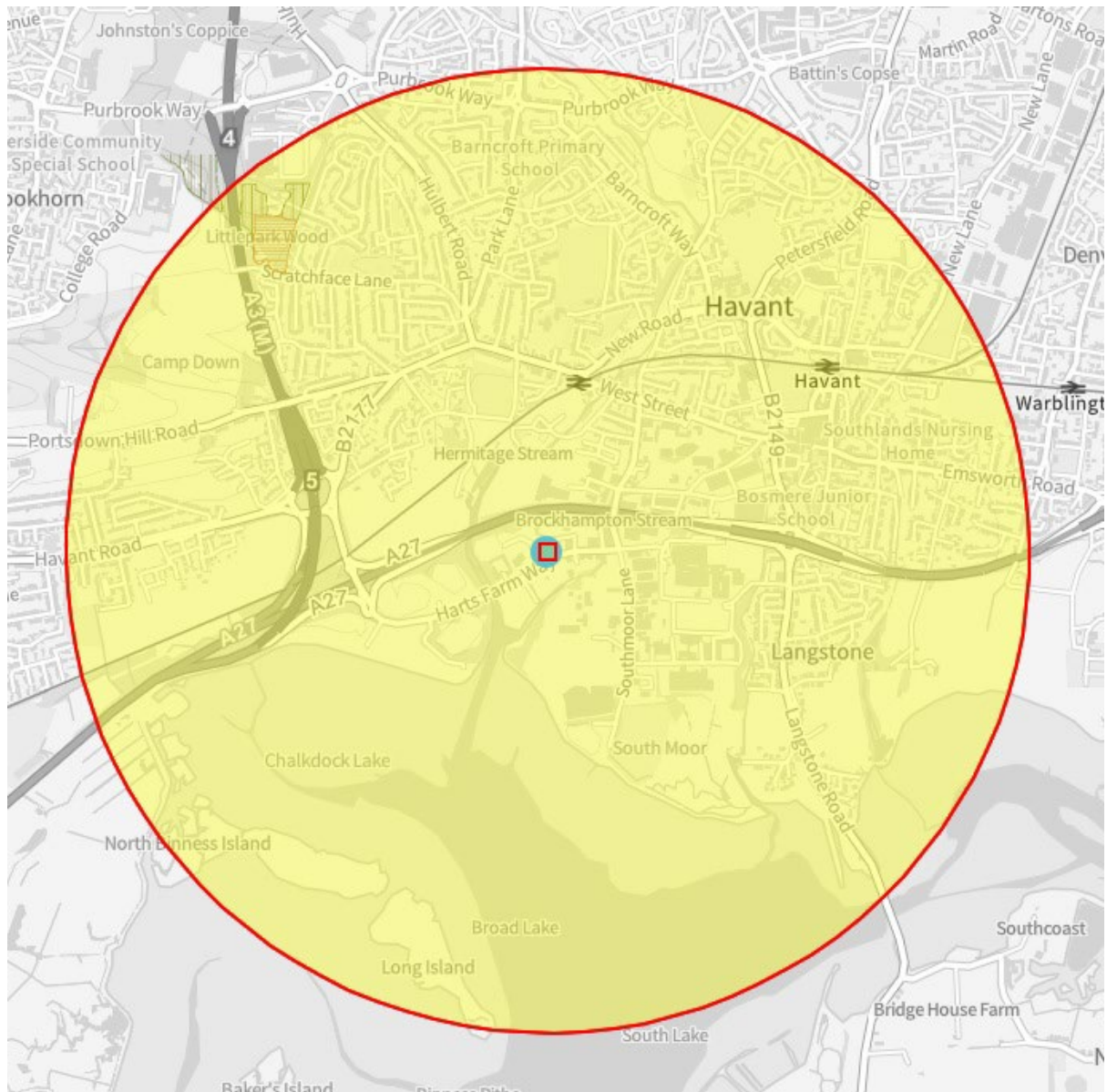
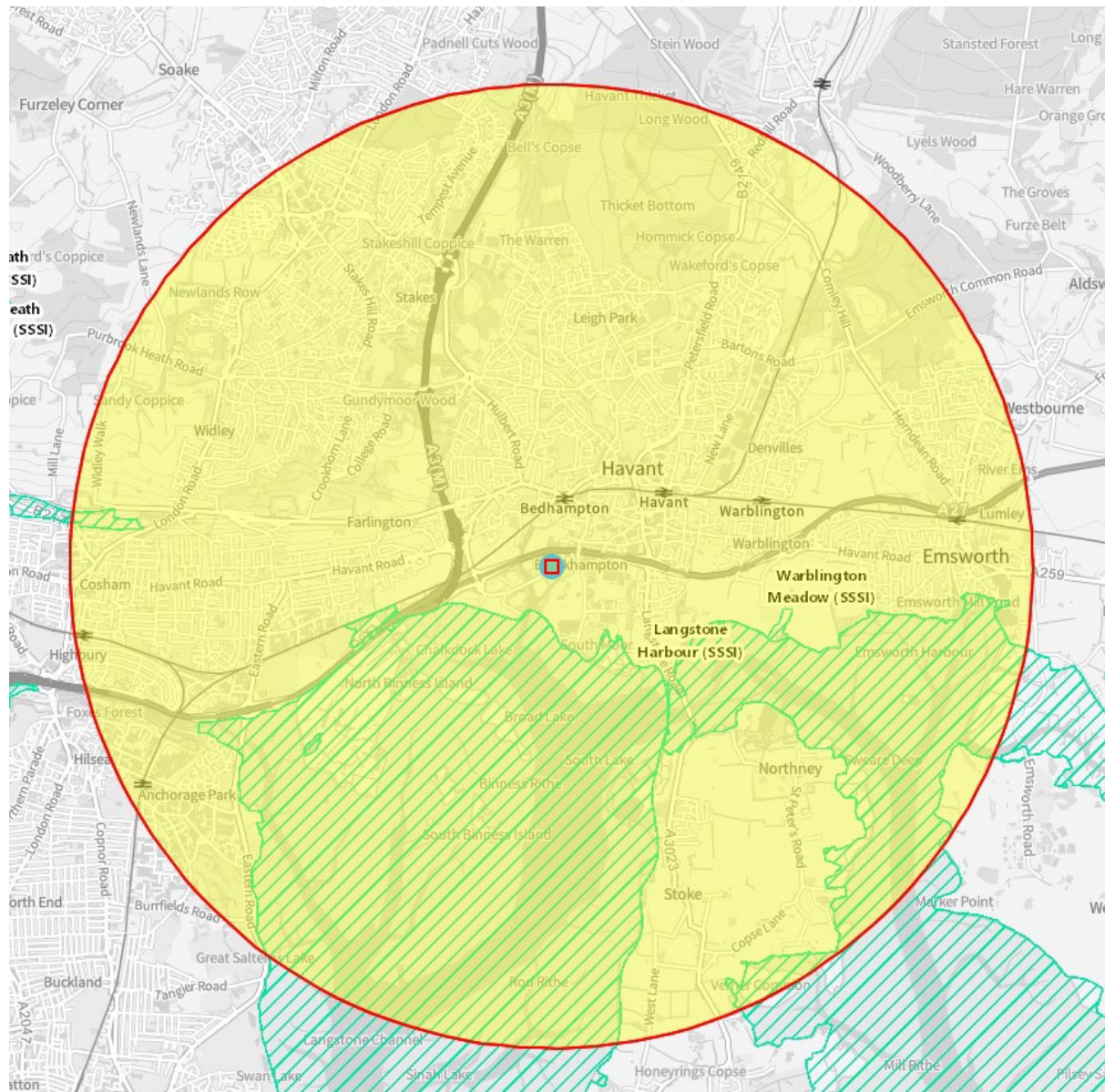


Figure E2: SSSI (5km)





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