Wiltshire Council
Where everybody matters

AGENDA

Meeting: **Strategic Planning Committee**

Place: **Council Chamber - County Hall, Bythesea Road, Trowbridge, BA14 8JN**

Date: **Wednesday 23 January 2019**

Time: **10.30 am**

Please direct any enquiries on this Agenda to Roger Bishton, of Democratic Services, County Hall, Bythesea Road, Trowbridge, direct line 01225 713035 or email roger.bishton@wiltshire.gov.uk

Press enquiries to Communications on direct lines (01225) 713114/713115.

This Agenda and all the documents referred to within it are available on the Council's website at www.wiltshire.gov.uk

Membership:

Cllr Fleur de Rhé-Philipe (Chairman)
Cllr Derek Brown OBE (Vice-Chairman)
Cllr Ernie Clark
Cllr Andrew Davis
Cllr Stewart Dobson
Cllr Sarah Gibson
Cllr David Jenkins
Cllr Christopher Newbury
Cllr James Sheppard
Cllr Tony Trotman
Cllr Fred Westmoreland

Substitutes:

Cllr Ian Blair-Pilling
Cllr Clare Cape
Cllr Matthew Dean
Cllr Christopher Devine
Cllr David Halik
Cllr Russell Hawker
Cllr Ruth Hopkinson
Cllr Chris Hurst
Cllr Nick Murry
Cllr Stewart Palmen
Cllr Graham Wright

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Public Participation

Please see the agenda list on following pages for details of deadlines for submission of questions and statements for this meeting.

For extended details on meeting procedure, submission and scope of questions and other matters, please consult Part 4 of the council's constitution.

The full constitution can be found at this link.

For assistance on these and other matters please contact the officer named above for details

AGENDA

Part I

Items to be considered when the meeting is open to the public

1 **Apologies**

To receive any apologies or substitutions for the meeting.

2 **Minutes of the Previous Meeting** *(Pages 7 - 16)*

To approve and sign as a correct record the minutes of the meeting held on 5 December 2018. (Copy attached)

3 **Declarations of Interest**

To receive any declarations of disclosable interests or dispensations granted by the Standards Committee.

4 **Chairman's Announcements**

To receive any announcements through the Chair.

5 **Public Participation**

The Council welcomes contributions from members of the public.

Statements
Members of the public who wish to speak either in favour or against an application or any other item on this agenda are asked to register by phone, email or in person no later than 10.20am on the day of the meeting.

The rules on public participation in respect of planning applications are detailed in the Council's Planning Code of Good Practice. The Chairman will allow up to 3 speakers in favour and up to 3 speakers against an application and up to 3 speakers on any other item on this agenda. Each speaker will be given up to 3 minutes and invited to speak immediately prior to the item being considered.

Members of the public will have had the opportunity to make representations on the planning applications and to contact and lobby their local member and any other members of the planning committee prior to the meeting. Lobbying once the debate has started at the meeting is not permitted, including the circulation of new information, written or photographic which have not been verified by planning officers.

Questions

To receive any questions from members of the public or members of the Council received in accordance with the constitution which excludes, in particular, questions on non-determined planning applications.

Those wishing to ask questions are required to give notice of any such questions in writing to the officer named on the front of this agenda no later than 5pm on **Wednesday 16 January 2019** in order to be guaranteed of a written response**.** In order to receive a verbal response questions must be submitted no later than 5pm on **Friday 18 January 2019**. Please contact the officer named on the front of this agenda for further advice. Questions may be asked without notice if the Chairman decides that the matter is urgent.

Details of any questions received will be circulated to Committee members prior to the meeting and made available at the meeting and on the Council's website.

6 **Planning Appeals and Updates** *(Pages 17 - 18)*

To receive details of completed and pending appeals, and any other updates as appropriate.

7 **18/09473/WCM - Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM at Northacre Renewable Energy, Stephenson Road, Northacre Industrial Estate, Westbury** *(Pages 19 - 206)*

A report by the Case Officer is attached.

8 **18/09550/FUL - Landscaping and screening bund at Land at Brook Farm / adj Northacre Renewable Energy, Stephenson Road, Northacre Industrial Park, Westbury** *(Pages 207 - 228)*

A report by the Case Officer is attached.

9 **Date of Next Meeting**

To note that the next meeting of this Committee is due to be held on Wednesday 20 February 2019 at County Hall, Trowbridge, starting at 10.30am.

10 **Urgent Items**

Any other items of business, which in the opinion of the Chairman, should be taken as a matter of urgency.

Part II

Item during whose consideration it is recommended that the public should be

excluded because of the likelihood that exempt information would be disclosed

None

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Wiltshire Council
Where everybody matters

STRATEGIC PLANNING COMMITTEE

MINUTES OF THE STRATEGIC PLANNING COMMITTEE MEETING HELD ON 5 DECEMBER 2018 AT COUNCIL CHAMBER - COUNTY HALL, BYTHESEA ROAD, TROWBRIDGE, BA14 8JN.

Present:

Cllr Fleur de Rhé-Philipe (Chairman), Cllr Ernie Clark, Cllr Andrew Davis, Cllr Stewart Dobson, Cllr Sarah Gibson, Cllr Christopher Newbury (for Minute No.73 only) , Cllr James Sheppard, Cllr Tony Trotman, Cllr Fred Westmoreland, Cllr Matthew Dean (Substitute) and Cllr Ruth Hopkinson (Substitute)

Also Present:

Cllr Jon Hubbard, Cllr Roy While and Cllr Richard Britton

67 **Apologies**

Apologies for absence were received from Cllr Derek Brown OBE who was substituted by Cllr Matthew Dean and Cllr David Jenkins who was substituted by Cllr Ruth Hopkinson.

68 **Minutes of the Previous Meeting**

Resolved:

To confirm and sign the minutes of the previous meeting held on 7 November 2018.

69 **Declarations of Interest**

There were no declarations of interest made at the meeting.

70 **Chairman's Announcements**

The Chairman reported that the following applications were due to be considered at the next meeting of this Committee on Wednesday 23 January 2019:-

Planning Application No. 18/09473/WCM –
Northacre Renewable Energy, Stephenson Road, Westbury, BA13 4WD

Consequently, it was considered that it would be beneficial for a site visit to be held prior to the meeting and it was suggested that this should take place on Monday 21 January 2019 at 10.30am. Members of the Committee supported this proposal. It was noted that Cllrs Russell Hawker, Gordon King, Jerry Wickham and Toby Sturgis would be invited to attend the site visit and furthermore, that representatives from the Environment Agency and Public Health be requested to send representatives to the committee meeting on 23 January 2019.

71 **Public Participation**

There were no questions or statements submitted.

72 **18/04644/REM - Land East of Spa Road, Melksham, Wiltshire - Approval of Reserved Matters in Respect of Landscaping, Appearance, Layout and Scale for the Erection of 447 Dwellings, Car Parking Including Garages, Internal Access Roads, Public Open Space and Associated Infrastructure and Engineering Works Following Outline Permission 14/10461/OUT**

The Committee received a presentation from the Case Officer which set out the issues in respect of the application. The purpose of the report was to consider the details of the reserved matters and to consider the recommendation that planning permission be granted, subject to conditions. It was noted that the original outline permission had been approved by this Committee.

Members then had the opportunity to ask technical questions after which they heard statements from members of the public as follows:-

Dr Horst & Mrs Mareile Feldman, who spoke against the proposal
Mr Peter Roberts, the applicant's agent, who supported the proposal

Cllr Alan Baines, representing Melksham Without Parish Council, expressed serious concerns with regard to the design and bulk of the proposed apartment block in the north west corner of the site and the detrimental effect this would have on the setting of the listed buildings to the south. The Parish Council wished to engage with the applicant regarding these and other concerns.

Members then heard the views of Cllr Roy While and Cllr Jon Hubbard, the local Members. Cllr Roy While considered that whilst he supported the proposed positioning of the houses, including the proposed three storey apartment block in the north west corner of the site, he shared the concerns of the Parish Council regarding the building of the community hall and the management of the play areas.

Cllr Jon Hubbard expressed particular concern about the siting of the three storey apartment block which he considered was too close to neighbouring properties and would infringe upon them. He was concerned upon the apartment block's impact upon the Grade II Listed Buildings.

During discussion, Members expressed the hope that the developer would have a meaningful dialogue with both Melksham Town Council and Melksham Without Parish Council regarding outstanding concerns. Members also requested the inclusion of a condition requiring a method statement.

On the proposal of Cllr Matthew Dean, which was seconded by Cllr Fred Westmoreland,

Resolved:

To grant approval of reserved matters, subject to the following conditions:-

1 No development shall commence on site until a Construction Environmental Management Plan (CEMP), incorporating pollution prevention measures, has been submitted to and approved by the Local Planning Authority. The plan shall subsequently be implemented in accordance with the approved details and agreed timetable.

REASON: The application contained insufficient information to enable this matter to be considered prior to granting planning permission and the matter is required to be agreed with the Local Planning Authority before development commences in order that the development is undertaken in an acceptable manner, in the interests of preventing pollution of the water environment

2 No development above slab level shall commence on site until the exact details and samples of the materials to be used for the external walls and roofs have been submitted to and approved in writing by the Local Planning Authority. Development shall be carried out in accordance with the approved details.

REASON: The application contained insufficient information to enable this matter to be considered prior to granting planning permission and the matter is required to be agreed with the Local Planning Authority before development commences in order that the development is undertaken in an acceptable manner, in the interests of visual amenity and the character and appearance of the area

3 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (England) Order 2015 (or any Order revoking or re-enacting or amending that Order with or without modification), the garage(s) hereby permitted shall not be converted to habitable accommodation.

REASON: To secure the retention of adequate parking provision, in the interests of highway safety.

4. No works shall commence on Area F or Area G of the site (as

shown in the Surface Water Drainage Strategy Plan, plan reference: 10484-500-531D) until the drainage scheme for the southern area of the site including the associated attenuation pond, landscaping and infrastructure works has been submitted to and approved in writing by the local planning authority. The scheme shall subsequently be implemented in accordance with the approved details and prior to the occupation of any dwelling in Area F or Area G hereby approved.

REASON: The application contained insufficient information to enable this matter to be considered prior to granting planning permission and the matter is required to be agreed with the local planning authority before development commences in order that the development is undertaken in an acceptable manner.

5. Prior to the area of hardstanding adjacent to the GradeII listed building being removed, a method statement detailing how it will be removed and how the listed wall will be protected during this process shall be submitted to and approved in writing by the local planning authority. The development shall then be carried out in accordance with the approved details.

REASON: In the interests of preserving the Grade II listed wall.

6 The development hereby permitted shall be carried out in accordance with the following approved plans:

<u>Received by the Local Planning Authority on 21st November 2018</u>

27846 HT Garages: HT-GAR-01.1, HT-GAR-02.1, HT-GAR-03.1, HT-GAR-04.1, HT-CSTR-01.1

<u>Received by the Local Planning Authority on 20th November 2018</u>

10484-500: 111_D, 112_D, 113_D, 114_D (Adoption Plan Sheets 1-4)

<u>Received by the Local Planning Authority on 15th November 2018</u>

27846: EXT-01a (external works), PL-01 (site location plan), PL-03.3h (planning layout), PL-03.4h (planning layout), SS-01c (street scenes), HT-HL-AF3-01B (apartment block)

27846-HT (affordable housetypes Rev C): HLA1-02B, HLA2-01B, HLA3-01A, HLA4-01A

27846-OM (housetypes Rev C): HT-HL1-01B, HT-HL2-01A, HT-HL2-02B, HT-HL3-01A, HT-HL3-02A, HT-HL3-03A, HT-HL4-01A, HT-HL4-02C, HT-HL5-01B, HT-HL5-02A, HT-HL6-01A, HT-HL6-02A, HT-HL6-03A, HT-HL7-01A, HT-HL7-02B, HT-HL8-01B, HT-HL8-02B

28125 AH Housetypes Rev B: HT-1BF-01A, HT-1BF-02B, HT-1BF-03B, HT-SHELL-01B, HT-SHELL-02B, HT-SINC-01A, HT-SINC-02A,

HT-SINC-03B, HT-SINC-04B, HT-SORL-01A, HT-SORL-02A, HT-SORL-SIN-01A, HT-SORL-SIN-02A, HT-SORL-SIN-03A, HT-STRAND-01A, HT-STRAND-02A,

28125 OM Housetypes Rev D: HT-CHES-01A, HT-CHES-02A, HT-CHES-03A, HT-CHES-04A, HT-CHES-05A, HT-BYRON-01A, HT-LYTT-01A, HT-LYTT-02A, HT-LYTT-03A, HT-HEYW-01A, HT-HEYW-02A, HT-MARL-01A, HT-MARL-02A, HT-MARL-03A, HT-MARL-04A, HT-MEDI-01, HT-MEDI-02, HT-HALL-01C, HT-HALL-02B, HT-BROO-01B, HT-WYATT-01B, HT-WYATT-02B, HT-MORR-01B, HT-MORR-02B, HT-HARW-01C, HT-HARW-02B, HT-DARL-01A, HT-DARL-02A, HT-MIDDLE-01, HT-MIDDLE-02, HT-LYBY-01A, HT-LYBY-02A, HT-LYBY-03A, HT-BCCB-01A, HT-BCCB-02A, HT-BM-01, HT-BM-02

28125 HT-HOG-01, 28125 PL-03.1j (planning layout), 28125 PL-03.2j (planning layout), 28125 SW109-SL-002M (material layout)

4769-L: 212L (on plot strategic softworks),

4769-L: 223J, 224J (hard landscape proposals)

<u>Received by the Local Planning Authority on 27th September 2018</u>

10484-500-701_A (highway construction), 4769-L-: 209F, 210H, 211F (on plot strategic softworks), 213D (on plot typical planting)

4769-L: 214D, 215D, 216D, 217D, 218D, 220D (structural landscape proposals)

4769-L: 221D, 222D (hard landscape proposals)

<u>Received by the Local Planning Authority on 17th September 2018</u>

10484-500-506E (eastern detention basin), 1-484-500-507A (western detention basin), 10484-500-513B (drainage catchment), 10484-500-539 (existing watercourse), 10484-500-541A (drainage standard details), 10484-500-551 (western basin control manhole details), 10484-500-522A (eastern basin control manhole details), 10484-500-561 (western basin inlet headwall details), 10484-500-562 (western basin outlet headwall details), 10484-500-563 (western basin headwall details - outfall), 10484-500-564 (eastern basin headwall), 10484-500-565 (eastern basin headwall), 10484-500-566 (eastern basin outfall headwall), 10484-500-571A (western basin sections), 10484-500-572A (eastern basin sections), 10484-500-580 (rising main washout chamber)

10484-500: 101C, 102C, 103C, 104C (highway layout sheet)

10484-500: 201C, 202C, 203C, 204C (finished floor levels)

10484-500: 302C, 303C, 304C (vehicle swept path analysis)

10484-500: 501D, 502D, 503D, 504D, 505D (drainage layout sheet)

10484-500: 511B, 512B, 513B, 514B, 515B, 516B, 517B, 518B, 519B, 520B, 521B, 522B, 523B, 524B (drainage long section)

10484-500: 532B, 533B, 534B, 535B, 536B (exceedance plan sheet)

10484-500:537A, 538A, 540A (land drainage works)

10484-500: 581C, 582C, 583B (foul water pumping station)

Received by the Local Planning Authority 12th September 2018

28125 Bin Store Details: HT-BIN-01, 27846 Parking Schedule, 27846 SE-01b (site sections), 4769-L-219D (structural landscape proposals NW boundary), 4769-L-225D (NW boundary planting offset details), 4769-L-226-227A (NW boundary illustrative sections)

28125 Gar-01 Garage Details Rev A: HT-GAR-01A, HT-GAR-02A

REASON: For the avoidance of doubt and in the interests of proper planning.

1 INFORMATIVE TO APPLICANT:

The submitted CEMP must include safeguarding measures to deal with the following pollution risks:

- the use of plant and machinery

- wheel washing and vehicle wash-down and disposal of resultant dirty water

- oils/chemicals and materials

- the use and routing of heavy plant and vehicles

- the location and form of work and storage areas and compounds

- the control and removal of spoil and wastes.

73 **18/09609/VAR: Trickys Paddock, Brickworth Road, Whiteparish, SP5 2QG - Variation/removal of Conditions 1 & 2 of permission S/2012/1307/S73**

The Committee received a presentation from the Case Officer which set out the issues in respect of the application. The purpose of the report was to assess the merits of the proposal against the policies of the development plan and

other material considerations and to consider a recommendation that the application be approved, subject to conditions.

Members then had the opportunity to ask technical questions after which they heard statements from members of the public as follows, expressing their views concerning the application:-

Mr Tony Phillips, the applicant's agent, in support of the application
Cllr Mike Hayday, representing Whiteparish Parish Council objecting to the proposal.

Members then heard the views of Cllr Richard Britton, the local Member, who set out his objections to the proposal. He stated that the original application was approved on a personal basis to the applicant (Mr Clarke) who had now moved with his family and therefore the current application should be refused on the basis that the original application no longer existed and therefore a completely fresh application was required rather than a proposal to vary a condition. Additionally, Cllr Britton considered that the proposal would represent an alien feature in the landscape.

During discussion, Members were assured that legally there was no reason why the current application before the Committee should be considered as irregular. Members considered that the landscaping of the site should be maintained and allowed to grow.

On the proposal of Cllr Fred Westmoreland, which was seconded by Cllr Tony Trotman,

Resolved:

To grant planning permission, subject to the following conditions:-

1. The use and occupation of the land hereby permitted shall be carried on only by Mr Jimmy Gammell, his wife and their resident dependants.
Reason: To define the scope of the consent and to enable the local planning authority to maintain control over the occupation of the site.

2. When the land ceases to be occupied by those named in condition 1) above the use hereby permitted shall cease and all caravans, structures, materials and equipment brought onto or erected on the land, or works undertaken to it in connection with the use, shall be removed and the land shall be restored to its condition before the development took place.

Reason: To ensure the restoration of the site upon the cessation of the use hereby authorised.

3. No more than 2 caravans, as defined in the Caravan Sites and Control of Development Act 1960 and the Caravan Sites Act 1968, as amended, (of which no more than one shall be a static caravan/mobile home) shall be stationed on the land at any time.

Reason: In the interests of amenity and the character of the surrounding landscape.

4. No vehicle over 3.5 tonnes shall be stationed, parked or stored on the land.

Reason: In the interests of amenity and the character of the surrounding landscape.

5. No commercial activities shall take place on the land, including the storage of materials.

Reason: In the interests of amenity and the character of the surrounding landscape.

6. No structure or erection or planting exceeding one metre in height shall be placed between the A27 carriageway and the 122m by 2.4m visibility splay measured in a westerly direction from the centreline of the access point onto the public highway.

Reason: In the interests of amenity and Highway safety.

7. The existing parking and turning areas within the site shall be retained thereafter for as long as the use permitted subsists and shall not be used for any other purposes other than the parking and turning of vehicles.

Reason: In the interests of amenity and Highway safety.

8. Within three calendar months of the date of this permission a scheme to ensure and facilitate the long term retention and ongoing maintenance of the existing levels of planting and natural screening within and around the site shall be submitted to and approved in writing by the Local Planning Authority. The long term retention and ongoing maintenance of the existing levels of planting and natural screening within and around the site shall be carried out in accordance with the approved details.

Reason: To ensure a satisfactory landscaped setting for the site and to ensure the ongoing mitigation in respect of the character of the surrounding Special Landscape Area.

74 **Date of Next Meeting**

Resolved:

To note that the next meeting of this Committee would be held on Wednesday 23 January 2019 at County Hall, Trowbridge, starting at 10.30am.

75 **Urgent Items**

There were no urgent items of business.

(Duration of meeting: 2.00 pm - 3.45 pm)

The Officer who has produced these minutes is Roger Bishton of Democratic Services, direct line 01225 713035, e-mail roger.bishton@wiltshire.gov.uk

Press enquiries to Communications, direct line (01225) 713114/713115

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Wiltshire Council
Strategic Planning Committee
23rd January 2019

Planning Appeals Received between 26/10/2018 and 11/01/2019 relating to Decisions made at Strategic Committee

Application No	Site Location	Parish	Proposal	DEL or COMM	Appeal Type	Officer Recommend	Appeal Start Date	Overturn at Cttee
18/03816/WCM	Northacre Renewable Energy Stephenson Road Northacre Industrial Estate, Westbury Wiltshire, BA13 4WD	WESTBURY	Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM	SPC	Inquiry	Approve with Conditions	26/11/2018	Yes

Planning Appeals Decided between 26/10/2018 and 11/01/2019 relating to Decisions made at Strategic Committee

Application No	Site Location	Parish	Proposal	DEL or COMM	Appeal Type	Officer Recommend	Appeal Decision	Decision Date	Costs Awarded?

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REPORT FOR STRATEGIC PLANNING COMMITTEE

Date of Meeting	23 January 2019
Application Number	18/09473/WCM
Site Address	Northacre Renewable Energy, Stephenson Road, Northacre Industrial Estate, Westbury, BA13 4WD
Proposal	Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM
Applicant	Northacre Renewable Energy Ltd
Town/Parish Council	WESTBURY
Electoral Division	WESTBURY WEST – Cllr Russell Hawker
Grid Ref	385757 151868
Type of application	Full Planning
Case Officer	Andrew Guest

Reason for the application being considered by Committee

The application is before the Committee because it involves matters of strategic relevance and because the application has generated significant public interest.

Additionally, the Local Division Member has 'called-in' the application for the following stated reason:

Very seriously contentious with large numbers of objectors - just like the recent similar refused application which went to the Strategic Planning Committee. This application is so contentious that it should go to committee whatever the officers recommend.

1. Purpose of Report

The report assesses the merits of the proposal against the policies of the Development Plan and other material considerations leading to a recommendation, which is to grant planning permission subject to conditions.

2. Report Summary

This is a full planning application to construct an Advanced Thermal Treatment Facility (ATT). The facility would use advanced thermal treatment technology, specifically gasification[1], to generate energy (electricity and heat) from 41,500 tonnes of solid recovered

[1] Gasification is a process which converts organic or fossil-based carbonaceous materials into carbon monoxide, hydrogen and carbon dioxide. This is achieved by reacting the materials at high temperatures, without combustion, with a controlled amount of oxygen and/or steam. The resulting gas mixture is called syngas (from synthesis gas) and is itself a fuel. The syngas can be combusted and the hot exhaust gases sent to a waste heat boiler to generate steam, which can be used in a steam turbine or used directly to produce electricity and heat, as in this case.

fuel (SRF) (produced in the adjacent Mechanical Biological Treatment (MBT) plant) and 118,500 tonnes of commercial and industrial wastes that would otherwise be landfilled or exported to mainland Europe as SRF. In terms of the Wiltshire and Swindon Waste Hierarchy this is a waste 'recovery' process – more particularly, 'Energy from Waste' (EfW).

The proposal is 'EIA development' and so the application is accompanied by an Environmental Statement. All necessary information has been provided in the Environmental Statement which has allowed environmental effects to be fully and properly assessed. The 'Non-Technical Summary of the Environmental Statement' (October 2018) is attached at Annex 1 to this report.

Key points -

- Development Plan – The Waste Site Allocations Local Plan 2013 allocates the Northacre Industrial Estate (in which the application lies) and some of the adjoining countryside as an area suitable for strategic scale "*materials recovery facility/waste transfer station, local recycling and waste treatment type uses*".

  The Wiltshire & Swindon Waste Core Strategy 2009 defines strategic waste management facilities as large and/or more specialist facilities that operate in a wider strategic manner by virtue of spatial scale, high tonnage of waste managed, specialist nature of the waste managed and/or a wider catchment served. They include Energy from Waste (EfW) facilities (and MBT facilities).

  It follows that the proposal – for a strategic scale EfW facility – on this site, which is allocated for this purpose, complies with the waste Development Plan Documents as a matter of principle.

- Existing Mechanical Biological Treatment (MBT) plant – As referred to above, the applicant operates a MBT plant on land adjoining the application site. This produces from municipal household waste solid recovered fuel (SRF) which is presently exported, by road, to mainland Europe for use in established energy from waste (EfW) facilities there. The current planning application, if approved, would remove the need for the export of the SRF; the SRF would instead be used in the proposed ATT/EfW facility, moving from one facility to the other by conveyor. There are both environmental and economic benefits arising from this.

  More generally the proposal would also change the way in which commercial and industrial wastes are managed within Wiltshire by reducing the need for these to be transported, mainly by road, from the county to other parts of the UK, and often to landfill; instead Wiltshire's wastes would be managed in Wiltshire. Again, there are environmental and economic benefits arising from managing the wastes in this way. These benefits are set out more fully below.

  The 'headline' environmental benefits are:

  - Reduced lorry miles compared with transferring material to European processors at over 500 miles one way.
  - Substitution of fossil fuel power generation with waste to energy.
  - Reduction of greenhouse gas emissions (methane) from landfill – the alternative to waste export.
  - The opportunity to provide heat into neighbouring businesses once operational.

  The 'headline' economic benefits are:

- Businesses operating in Wiltshire producing non-recyclable waste would have the opportunity for their material to be dealt with locally instead of exported at great expense to other areas of the UK or overseas.
- Both the money generated from the 'gate fee' and the power generated by the ATT plant would be used in the UK from UK produced waste rather than mainland Europe benefitting. Currently 3.5 million tonnes of material is exported from the UK to Europe for use by European energy plants creating heat and power there. The UK is paying a premium for this, with the economies of the other countries benefitting.
- Offer a 'better than market gate fee' for Wiltshire Council's material from the adjacent MBT Plant. The estimated savings against waste export/landfill or utilising other UK energy from waste schemes are substantial over the life of the treatment contract.

In broad policy terms, the consequences are that the proposal would fulfil the environmental and economic objectives of sustainable development, and so accord with these fundamental principles of the National Planning Policy Framework.

- 2015 planning permission - The current application is effectively a revision to planning permission 14/12003/WCM, which is also for an ATT facility. That permission was granted on 23 September 2015. It has not been implemented, but remains extant. Works to commence 14/12003/WCM, which are common to both it and the current planning application, are programmed to commence at end 2018 / early 2019. The fact that there is an extant planning permission for an ATT facility at the site is a significant material consideration now.

  2018 refusal – In July 2018 the Strategic Planning Committee refused application no. 18/03816/WCM which proposed a different layout and design for an ATT facility at the site. The main changes between 14/12003/WCM and 18/03816/WCM were:

  - Increased height of buildings incorporating more efficient boiler system and to achieve safe access around the boiler;
  - Increased stack height to comply with emerging Environment Agency guidance on Best Available Technique[2];
  - Enclosure of the thermal plant (gasifier, boiler and turbine) to assist in year round operations and maintenance;
  - Installation of one fewer turbine and a reduced bank of air-cooled condensers due to improved efficiencies in the process.

  The single detailed reason for refusal related to the adverse impact of the proposal on the appearance of the area …..

  The proposed development, by reason of its height, bulk and location on rising ground on the edge of the built-up area, would have an adverse impact on the appearance of the area. This would conflict with Core Policy 51 in the Wiltshire Core Strategy, which seeks to protect, conserve and enhance the visual amenity of the landscape.

  An appeal has been lodged against this refusal decision. The applicant has requested a local inquiry, which would likely be held Summer/Autumn 2019.

[2] 'Best Available Techniques' (BAT) means the available techniques which are the best for preventing or minimising emissions and impacts on the environment. Techniques include both the technology used and the way installations are designed, built, maintained, operated and decommissioned.

Specific additional changes in the current application compared with the refused application 18/03816/WCM are as follows:

- Re-profiling and regrading of the site to reduce the base (finished floor) level of the site from a sloping site at 64.7m AOD (with a slope to the west) to a level site at 62.0m AOD;
- Reduction in height of the process buildings;
- Changes to the layout which move the waste feedstock and preparation building away from the south west corner of the site, and so reduces its 'bulk';
- Reduction of total building footprint by 376 sq m;
- Adoption of a bespoke colour scheme to break up the mass of the buildings and reduce their visual and landscape impact.

The application is supported by a Landscape and Visual Impact Assessment which considers the effects of the proposed development against the baseline of an undeveloped site as well as against the baseline of the already consented ATT at the site. The visualisations provided with the LVIA demonstrate that the visual impacts of the proposed development would not be dissimilar to the already consented ATT, and that the revised design is a clear improvement on the previously refused scheme, *and* that it would be in keeping with the scale of development at the adjacent dairy.

The LVIA conclusions on the visual effects of the proposal are agreed – notably, that when considered against the future baseline of the employment and/or waste facility site allocation *and* the consented ATT scheme, the magnitude of change from this future baseline scenario reduces, compared to the magnitude of change from an undeveloped site, in most viewpoints. The visual effects of the proposed development compared to the previously consented scheme are not significant and would not constitute a defendable reason for refusal.

The identified 'Medium Adverse' landscape effect of the proposal on the landscape character of the 'North Bradley Rolling Clay Lowland Landscape Character Area lying to the west of the site reduces to 'Slight Adverse' in the context of the consented ATT scheme and the employment land allocations. The boundary of this landscape character area will be affected by any future development on the allocated employment land / allocated waste site and is already influenced by existing industrial development along its eastern side. In this context the landscape effects of the proposed development would not be significant or at variance with landscape trends in this part of the landscape character area adjacent to the allocated employment site. In any event the benefits of the proposal for waste management in Wiltshire and for sustainability in general outweigh any conflict with the landscape and visual effects identified.

There were no further reasons for refusal, and the information and conclusions presented in the re-submission across the other topics of the ES remain consistent to that previously considered.

- Environmental Permitting – National Planning Policy for Waste advises that when determining waste planning applications, waste planning authorities should "…. *concern themselves with implementing the planning strategy in the Local Plan and not with the control of processes which are a matter for the pollution control authorities. Waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced*".

The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. The proposal requires an Environmental Permit (EP), issued by the Environment Agency, before it can operate. The permitting process will be subject to public consultation in this case. It will also include consultations with the WC Environmental Protection Service, the Health & Safety Executive, Public Health England and the Fire & Rescue Service.

Before an EP is issued the Environment Agency must be satisfied not only that the environment and human health is protected but also that the operator is 'fit and competent' to run the facility.

The EP process of determination assesses odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air, discharges to ground or groundwater, global warming potential and generation of waste.

EPs set operational conditions, technical requirements, continuous monitoring and reporting requirements as well as emission limit values to meet the requirements of the Industrial Emissions Directive and other relevant legislation.

The Environment Agency carries out regular unannounced inspection visits to ensure that facilities are operating in accordance with the permit conditions and scrutinises all data associated with Permitted facilities. The Environment Agency has the power to suspend any Permits it considers are not being fully complied with or if creating an unacceptable risk.

The Environment Agency has not raised any 'show-stopping' concerns over issuing a permit for this proposed development. The Environment Agency raises no objections to this planning application.

Notwithstanding the Environmental Permitting regime, the planning application and its associated Environmental Statement provide evidence to demonstrate that the effects of noise, emissions, odours, etc. would be negligible / imperceptible in any event.

The application site lies within the Westbury Civil Parish, with Dilton Marsh CP approximately 300m to the west.

Westbury Town Council objects to the application; Adjoining Dilton Marsh Parish Council objects to the application. Nearby local councils - Bratton PC, Heywood PC and Frome TC - object.

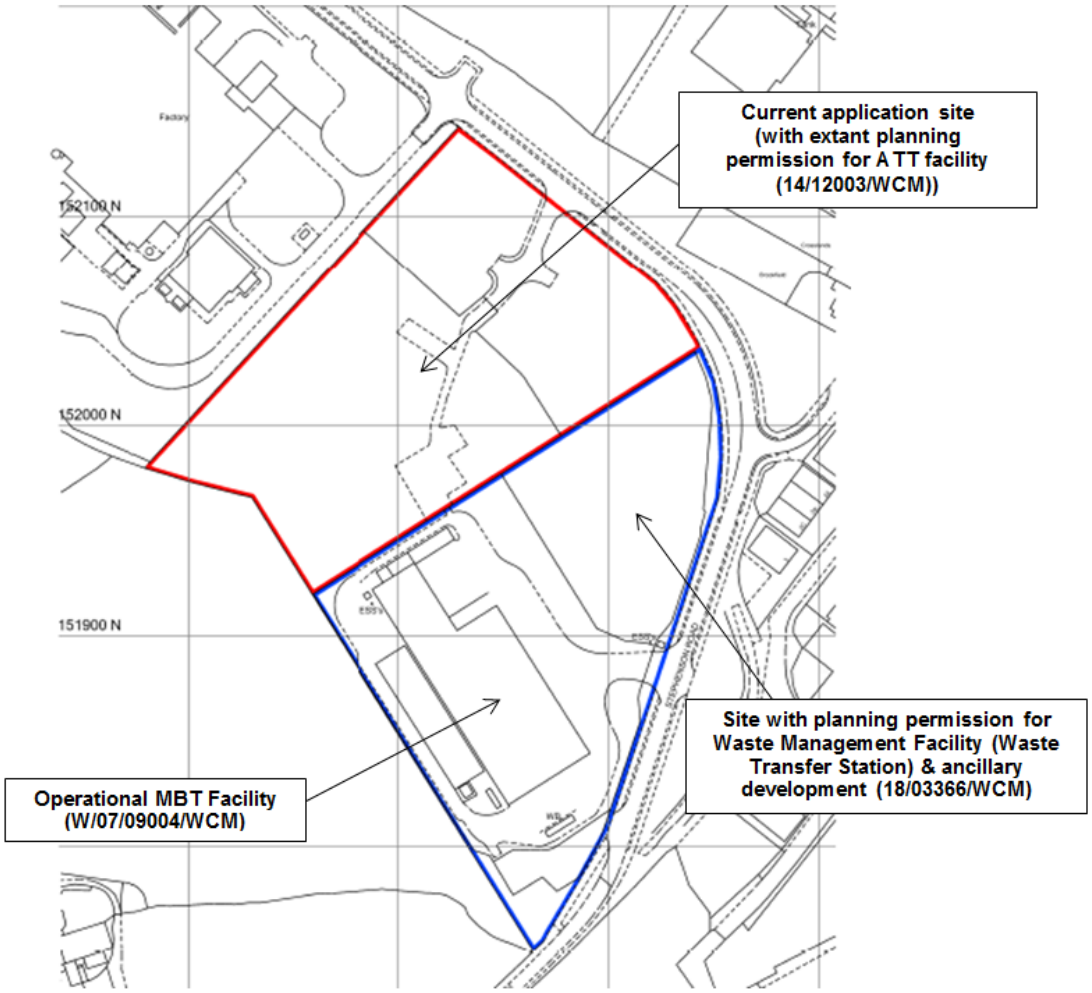
The planning application has been publicized by local advertisement, site notice and letters to neighbours. This has generated 526 representations (at 07/01). Of these 520 are objections, 5 are supports, and 1 expression of 'concern'.

The application is recommended for approval.

3. Site Description

The application site is located on the north-west side of Westbury 'Market Town', within the Northacre Industrial Estate (named variously as Northacre Industrial Estate, Northacre Trading Estate, Northacre Industrial Park, etc.) which itself is part of a larger industrial area including the West Wilts Trading Estate (to the north) and the Brook Lane Trading Estate (to the south-east). For planning purposes these areas are designated as a Principal

Employment Area and/or an Employment Allocation, and the Northacre Industrial Estate is also an allocated Strategic Scale Waste Site. Beyond the Brook Lane Trading Estate is the mainline railway.



Red-edged Site Plan

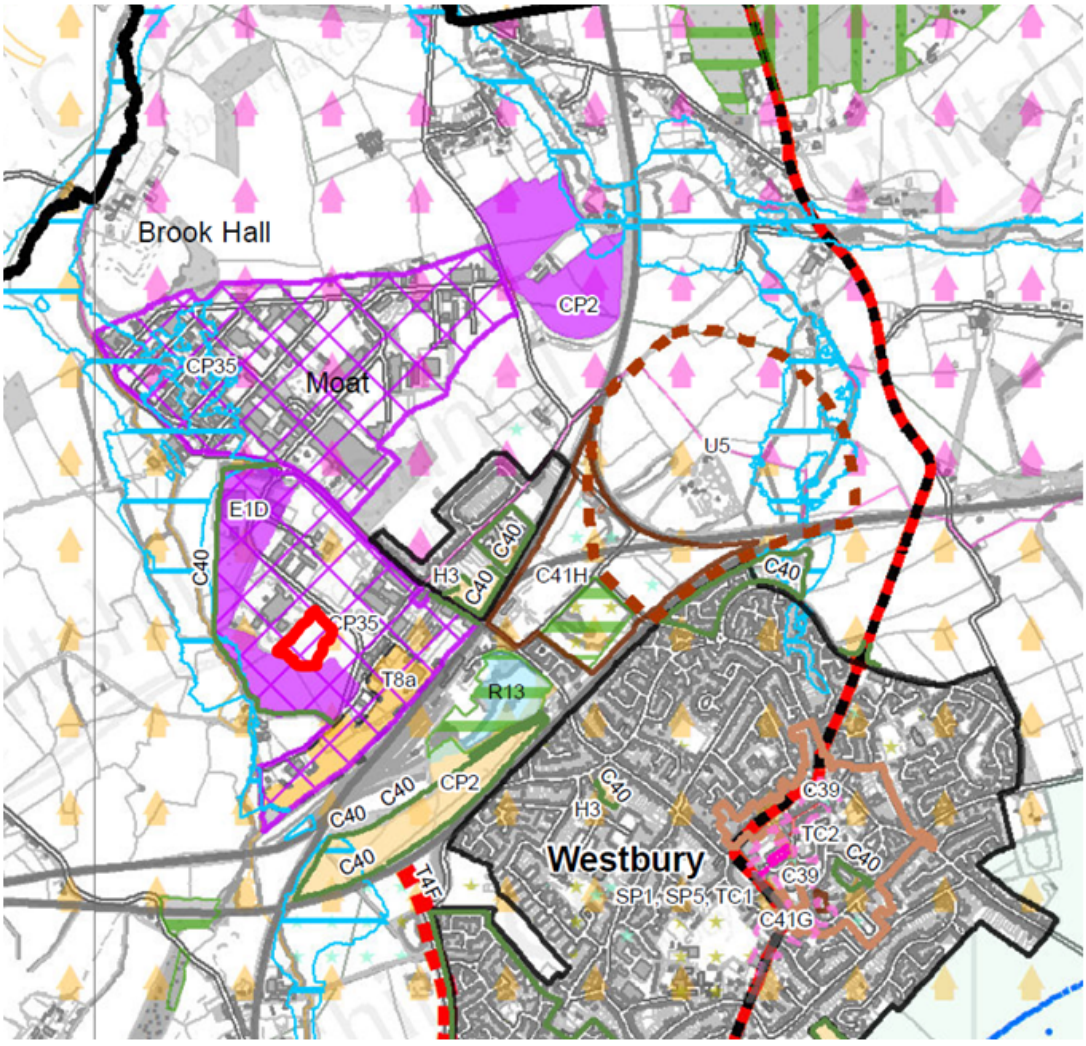
The application site itself forms part of a larger land parcel within the control of the applicant. Within this parcel, and to the immediate south of the application site, is the Northacre Resource Recovery Centre (RRC), currently supporting a 'mechanical biological treatment' (MBT) facility and an un-developed 'plot'. The un-developed plot has two planning permissions – firstly, for a vehicle depot and household recycling centre (HRC) (it is now not intended to implement the HRC); and secondly, for a 'waste transfer station' (WTS), enlarged depot and Welfare, Office and Workshop building (18/03366/WCM) (now being implemented). The land proposed for development in the current planning application (18/09473/WCM) is presently open/un-developed (that is, a vacant plot within the industrial estate).

The site has frontage to the south-west side of Stephenson Road which is a principal traffic route within the Northacre Industrial Estate.

To the immediate north of the application site is a large milk processing factory (Arla Dairies). To the south and east of the site and on the opposite side of Stephenson Road,

are various other industrial/business units and uses and a sewage works, and a few remaining vacant plots awaiting new industrial/business uses, and two residential properties – Brookfield and Crosslands – fronting Brook Lane. To the west is open land, in part within the defined Principal Employment Area, Employment Allocation and waste site allocation. Beyond this open land, c. 300m from the site, are two further residential properties – Brook Farm and Orchard House.

As set out above, for planning purposes the site and its close surroundings are designated as a Principal Employment Area and/or an Employment Allocation in the Wiltshire Core Strategy 2015. In addition, the Northacre Industrial Estate and the Employment Allocation is an allocated Strategic Scale Waste Site in the Wiltshire & Swindon Waste Site Allocations Local Plan 2013. To the west of the site – beyond Brook Farm and Orchard House – is open countryside and a Scheduled Monument ("medieval settlement and associated field systems").



Extract from Wiltshire Core Strategy Policies Map

[Red line – application site; Purple shading (E1D) – Employment Allocation;
Purple diamond hatching (CP35) – Principal Employment Areas; Orange shading (T8a) – Rail Freight Facility;
Red/Black line – Strategic Lorry Route]

4. **Relevant Planning History**

14/12003/WCM – *Advanced thermal treatment facility* – approved 23/09/15

This planning permission has not been built out but remains extant. Works which are common to both it and the current planning application are programmed to commence at end 2018 / early 2019.

14/12003/WCM – Approved General Layout Plan for ATT Facility

18/03816/WCM – *Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM* – refused 18/07/18

The single detailed reason for refusal is as follows:

The proposed development, by reason of its height, bulk and location on rising ground on the edge of the built-up area, would have an adverse impact on the appearance of the area. This would conflict with Core Policy 51 in the Wiltshire Core Strategy, which seeks to protect, conserve and enhance the visual amenity of the landscape.

Other related planning permissions ……

W/07/09004/WCM – *Resource recovery facility including mechanical biological treatment, a household recycling centre, vehicle parking and all necessary ancillary development* – approved 31/03/09

This permission relates to the land to the south of the application site (see plan above).

The mechanical biological treatment (MBT) element of this planning permission - subsequently amended by permission no. W/12/00656/WCM - commenced operation in 2013. An HGV depot forming part of the approved ancillary development is intended to come into use shortly when the collection of recyclable materials from homes in Wiltshire changes from a kerbside separation system to a mixed system in association with the applicant (Hills Waste Solutions) taking on the contract for collection of all household waste and recyclables.

The MBT plant was originally permitted to process 60,000 tonnes pa of Wiltshire's household waste, used to create solid recovered fuel for use in renewable energy plants. In 2016 permission was given to increase the material processed to 90,000 tonnes pa (16/08074/WCM). The household waste is brought directly to the plant in refuse collection vehicles, with some material from further afield imported in bulk from a waste transfer station. Presently the solid recovered fuel is exported by road to end users in Germany and Holland; residue is transported to landfill. The planning application now being considered (18/09473/WCM) would use the solid recovered fuel in its advanced thermal treatment (ATT) process instead.

The household recycling centre element of W/07/09004/WCM is not now being implemented. Instead this area of the site has standalone planning permission for a Waste Management Facility (that is, a waste transfer station for municipal waste for recycling) and welfare, office and workshop building with ancillary development (18/03366/WCM).

18/03366/WCM – *Waste management facility and welfare, office and workshop building with ancillary development* – approved 18 July 2018

Other related 'live' planning applications …..

18/09550/FUL – *Landscaping and screening bund*

This is a standalone application for a graduated landscaped bund (up to c.13m above original ground levels), to soften views of the proposed ATT in views from the west.

5. Proposal

The proposal is to construct an 'Advanced Thermal Treatment' (ATT) facility – this an alternative design to both the ATT approved under reference no. 14/12003/WCM and the ATT refused under reference 18/03816/WCM.

Advanced Thermal Treatment (ATT) refers to technologies that employ pyrolysis or gasification to process residual wastes. The Northacre facility would employ gasification to produce energy from waste. Unlike incineration, the input material is not burned but is instead heated in a special chamber with limited oxygen which prevents combustion.

The supporting statement with the application explains the proposal as follows:

> "….. Since planning permission was granted Northacre Renewable Energy (NRE) have been working with providers of the ATT technology as well as investors and partners,

engineering procurement and construction contractors and securing government subsidy for renewable energy 'Contract for Difference'[3] which was awarded in September 2017.

The work that had been done with the engineering and procurement contractor looks in detail at construction aspects of project in the scale of the Northacre facility. This is an important pre-development step for any sizeable construction proposal that frequently results in changes and amendments being needed in the design. The Northacre ATT facility will also be regulated by the Environment Agency before it is operational and the requirements that the EA impose have also been kept under review as the regulators view on what is Best Available Technique (BAT) can evolve in the period between planning and operations commencing. The application is a result of both these factors.

An application for revisions to the layout and design was submitted in April 2018 (ref 18/03816/WCM) and, despite being recommended for approval, was refused in July 2018 …."

The general changes to the development approved in 2015 which are relevant to both the April 2018 proposal and the current proposal can be summarised as follows:

- Increased height of buildings to incorporate more efficient boiler system and to facilitate safe access around the boiler plant.
- Increase in stack height to comply with emerging Environment Agency guidance on Best Available Technique.
- Enclosure of the thermal process plant (gasifier, boiler and turbine) to assist year-round operations and maintenance.
- Installation of one fewer turbine and a reduced bank of air cooled condensers due to improved efficiencies in the process.

The current application proposes further revisions to the approved layout and design, to address the reason for refusal in the April 2018 application. The specific further revisions in the current proposal are as follows:

- Re-profiling and regrading of the site to reduce the base (finished floor) level of the site from a sloping site at 64.7m AOD (with a slope to the west) to a level site at 62.0m AOD.
- Reduction in the height of the process buildings.
- Changes to the layout which move the waste feedstock and preparation building away from the south west corner of the site.
- Reduction in total building footprint by 376 sq m.
- Adoption of a bespoke colour scheme to break up the mass of the buildings and reduce their visual impact.

The development is expected to employ around 40 staff.

There is effectively a single main building now proposed containing the waste reception / feedstock preparation areas and the ATT facility. In addition there are other smaller buildings containing plant and free-standing plant (including odour treatment plant/stack, air cooled condensers, electricity sub-station, weighbridge & office, air pollution control measures (flue gas treatment), and fire protection measures).

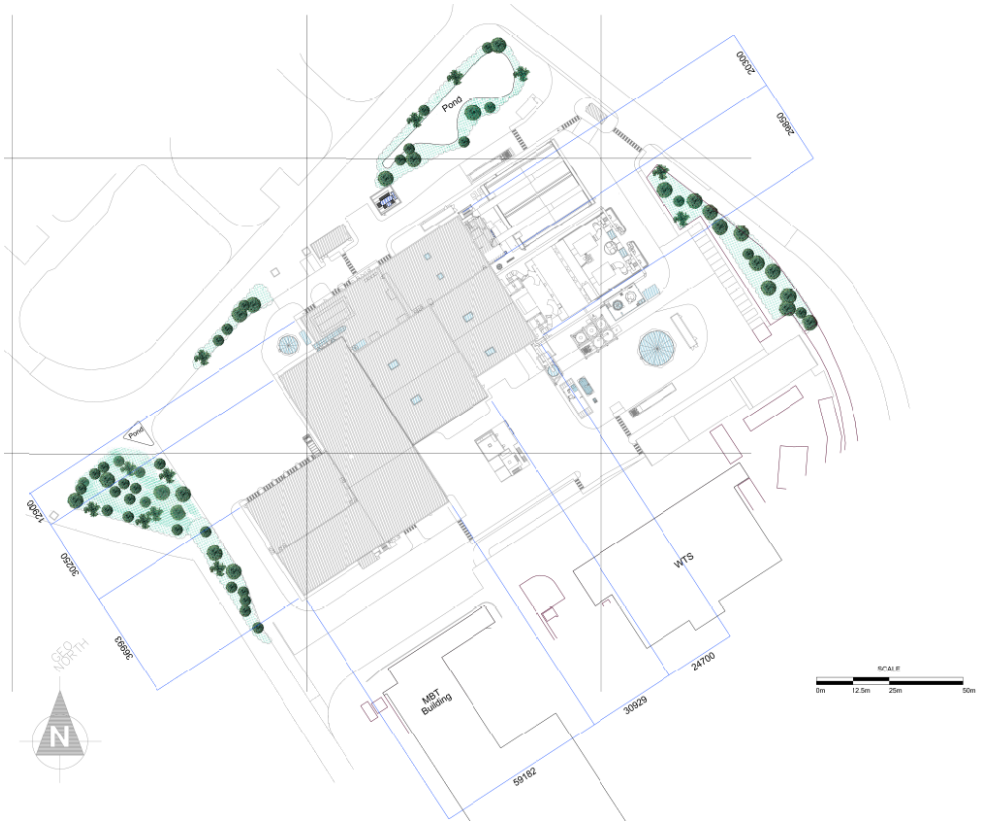
[3] The Contracts for Difference (CfD) scheme is the government's main mechanism for supporting low-carbon electricity generation and part of the UK Government's programme of Electricity Market Reform. Northacre Renewable Energy Centre was one of six energy-from-waste projects or 'Advanced Conversion Technologies' (ACT) to secure funding in the second government CfD auction for renewable technologies. The Northacre project has the capacity to power 46,220 homes.

The main building would have a maximum height of 36.8m, and maximum dimensions of c. 115m by 81m; a stack on the building would be 40m high. Other plant buildings and plant structures would be smaller, this with the exception of a main stack measuring 75m in height. The buildings/plant would be typically industrial in appearance, clad mainly in steel sheeting, coloured grey and/or shades of green.

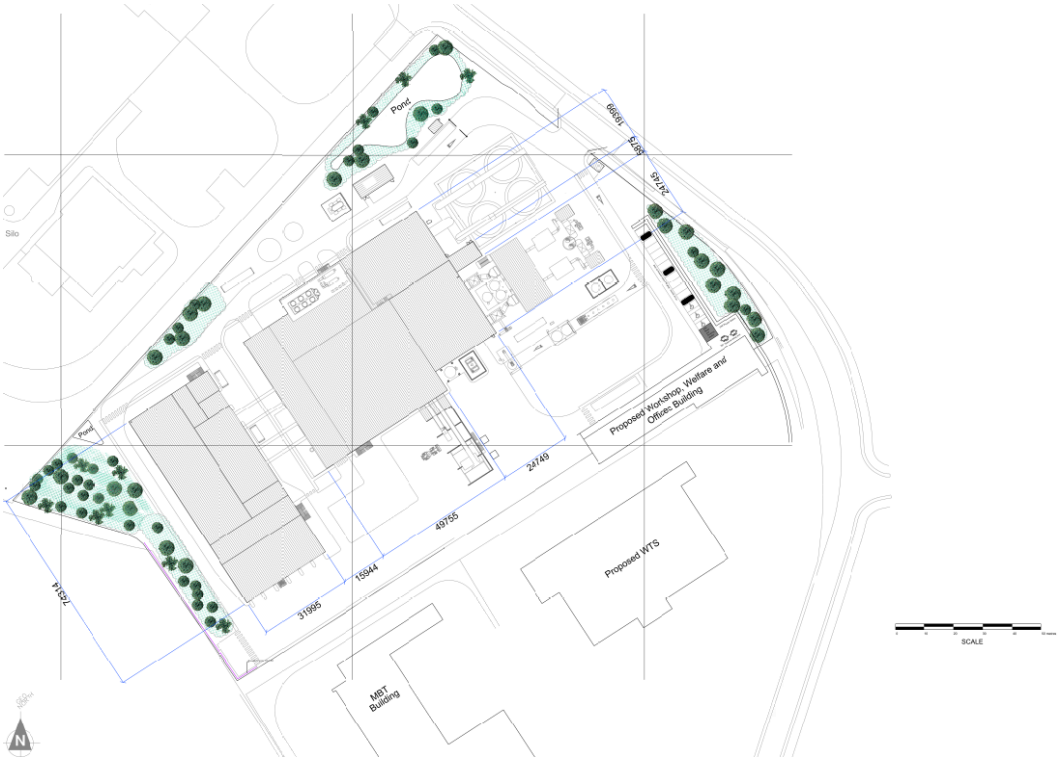
For reference, the ATT building previously approved under reference 14/12003/WCM has maximum height of 22m, and a main stack of 60m. The facility refused under reference 18/03816/WCM proposed two main buildings with maximum height of 37.8m, and a main stack of 75m. However, the level at which the buildings are now proposed to be constructed is c. 2m lower than the approved design as the site will be reduced in height, creating the material which would form the landscaped bund referenced above and below.

The adjoining Arla Dairies building has an estimated maximum roof height of c. 33.5m and stack heights of approximately c. 38.5m.

The proposed 'Site Plan' for the current application is set out below, this followed by the refused 2018 site plan (for comparison):



Proposed Site Plan



Refused Site Plan – 18/03816/WCM

In addition to the buildings and plant, the proposal includes internal roads, hard-standings for manoeuvring vehicles and a car park for 13 vehicles. There would be direct connectivity with the workshop, welfare and offices building approved under 18/03366/WCM. Some landscaping is proposed at the edges of the site, incorporating balancing ponds for drainage, and a 2.5m high weldmesh fence would be erected around the site's perimeter (and a c. 3.5m high acoustic fence/barrier adjacent to Stephenson Road).

Access to the site from Stephenson Road would be in the position of the existing access. Stephenson Road links via the B3097 to the A350, which is a strategic lorry route.

A standalone planning application (18/09550/FUL) proposes a landscaped bund to the immediate west of the site, its purpose to soften the visual impact of the development in views from the west.

Operation

The Environmental Statement accompanying the planning application sets out a summary of how the ATT will operate, as follows:

> "The proposed development uses advanced thermal treatment technology (gasification) to generate electricity and heat from 41,500 tonnes of solid recovered fuel (SRF) and 118,500 tonnes of mixed commercial and industrial waste that would otherwise be exported to mainland Europe as SRF or landfilled in Wiltshire respectively. Some 25.5 MW electricity / year will be generated, of which approximately 4 MW will be used on the site itself and 2 MW used by the adjacent Northacre RRC, with the remaining 19.5 MW exported to local users via private wire connection or to the national grid.
>
> Gasification is the thermal decomposition of material in an atmosphere, which does not contain enough oxygen to allow full combustion. It is a well-established process dating from

the early 1800s, when it was first used to produce town gas from coal. The process results in the production of a combustible gas, 'syngas', which typically contains a mix of predominantly carbon monoxide, hydrogen, and some methane.

The basic stages of the technology are as follows:

- Gasification of the feedstock (waste) to produce syngas
- Combustion of the syngas
- Utilisation of the heat generated through a waste heat boiler in order to generate steam
- Use of this steam in a steam turbine to generate electricity
- Control of emissions.

The development of Northacre Renewable Energy will:

- Be part of a local circular economy, turning waste into a fuel to generate renewable energy
- Generate local energy to power local businesses
- Deal with local waste, primarily from Wiltshire
- Create local employment
- Promote a sustainable Wiltshire and Wiltshire's aspiration for a green economy".

Material for processing at the ATT would be brought on to the site by HGVs as well as by conveyor from the adjoining MBT plant. HGVs would unload within the waste reception / feedstock preparation building, only when the roller shutter doors are closed. HGVs removing recovered materials would operate in a similar way. Other HGVs delivering materials for use in the processing (e.g. chemicals and fuel) would un-load in the relevant areas on the site.

The facilities would operate 24 hours/day, seven days/week. HGV deliveries would take place between the hours of 07:00 – 22:00 Monday to Friday and 07:00 – 17:00 Saturdays over the equivalent of 304 days/year (six days/week including Bank Holidays). Electricity would be produced all of the time.

Environmental Permitting

In order to operate, the facility will require an environmental permit that is issued by the Environment Agency (EA). The role of the environmental permit is to provide the required level of protection for the environment from the operation of a waste facility. The permit will aim to prevent pollution through the use of measures to prohibit or limit the release of substances to the environment to the lowest practicable level. It also ensures that ambient air and water quality meet standards that guard against impacts to the environment and human health.

The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. On EP the Environmental Statement says the following:

"The syngas produced will be combusted and the exhaust gases held at a temperature of >850oC for >2 seconds in accordance with the requirements of the Industrial Emissions Directive. Exhaust gases are drawn through an Air Pollution Control (APC) system aided by an induced draft fan and are then discharged to atmosphere via a stack. The APC system includes a number of different types of treatment systems, which are designed according to the characteristics of the waste feedstock.

Operators have to manage and operate activities in accordance with a written environmental management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints.

The Agency requires that all applications for Environmental Permits for new installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 demonstrate the use of Best Available Techniques (BAT) for a number of criteria, including emissions and energy efficiency; one of the principal ways that energy efficiency can be improved is through the use of combined heat and power (CHP).

Environmental Permits have a series of conditions attached addressing specific outcomes e.g. emissions and monitoring requirements, maintenance of records, requirements for staff competence etc., which must be complied with. The Agency conducts regular inspection visits to ensure that facilities are operating in accordance with the permit conditions".

The EP process of determination assesses odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air, discharges to ground or groundwater, global warming potential and generation of waste. EPs set operational conditions, technical requirements, continuous monitoring and reporting requirements as well as emission limit values to meet the requirements of the Industrial Emissions Directive and other relevant legislation. The Environment Agency carries out regular unannounced inspection visits to ensure that facilities are operating in accordance with the permit conditions and scrutinises all data associated with Permitted facilities. The Environment Agency has the power to suspend any Permits it considers are not being fully complied with and are creating an unacceptable risk.

Relationship of proposal with Northacre Resource Recovery Centre (the MBT plant)

The proximity of the site to the existing Mechanical Biological Treatment (MBT) facility on the adjacent land is no coincidence, and is a material consideration in the determination of this planning application. The background to the MBT and the relevance of it to the current application is explained in the Environmental Statement in the following terms:

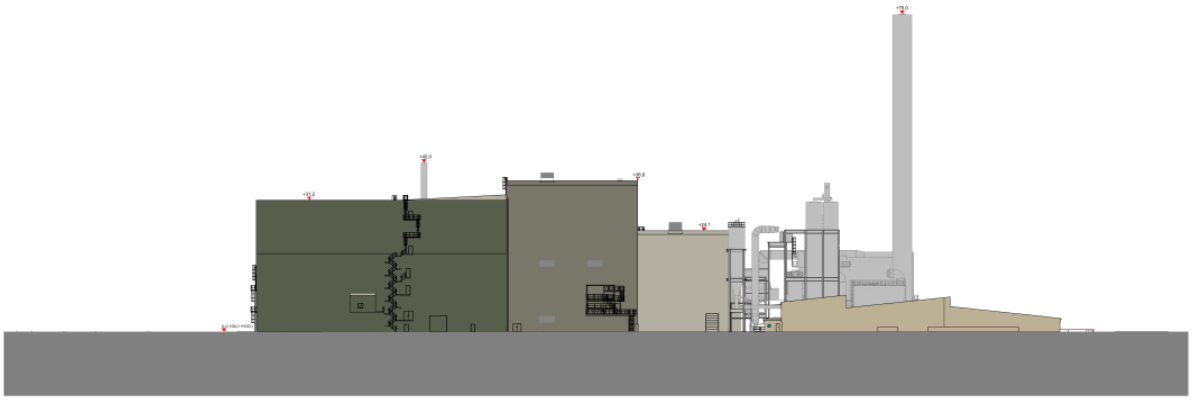
"Hills Waste Solutions Ltd operates a mechanical biological treatment (MBT) plant in Westbury at its Northacre Recycling and Recovery Centre ('Northacre RRC') adjacent to the proposed development. The plant is founded on a 25-year contract with Wiltshire Council to manage and treat a minimum of 60,000 tonnes of municipal waste per annum. Northacre RRC converts the waste into an SRF product that was originally destined for a local cement production facility operated by Lafarge. The closure of Lafarge's facility in 2008 led to a lengthy delay in signing the contract with Wiltshire Council whilst an alternate route for the SRF was found.

Towards the end of 2010, Hills negotiated a deal to export the fuel to Europe for the first five years of Northacre RRC's operation / output. This deal, in turn, enabled Hills to complete signing of the long-term contract with Wiltshire Council in April 2011. As part of the agreement with the Council, Hills is further required to put in place a UK end user for the SRF fuel prior to the end of the export contract.

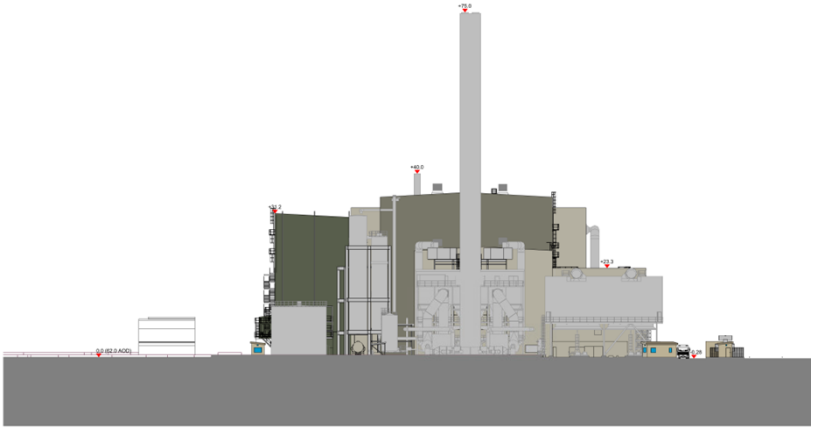
Rather than relying on third parties to use the SRF ….. Hills purchased the land between Northacre RRC and Arla Foods Westbury Dairies with the intention of developing and operating its own energy recovery facility in order to fulfil the regional need. The site had a

number of advantages, paramount of which was its proximity to Northacre RRC, meaning that vehicle movements associated with transport of the SRF would be eliminated".

The application/ES are accompanied by a Planning Statement, Air Quality Assessment, Noise Assessment, Transport Assessment, Ecological Appraisal, Landscape & Visual Impact Assessment, Heritage Assessment and Accident Risk Assessment.



South facing elevation



East facing elevation

6. Planning Policy and Guidance

Wiltshire & Swindon Waste Core Strategy 2009

- WCS1 – The Need for Additional Waste Management Capacity & Self Sufficiency
- WCS2 – Future Waste Site Locations
- WCS3 – Preferred Locations of Waste Management Facilities by type and the Provision of Flexibility
- WCS4 – Safeguarding Waste Management Sites
- WCS5 – The Wiltshire & Swindon Waste Hierarchy and Sustainable Waste Management

Wiltshire & Swindon Waste Development Control Policies DPD 2009

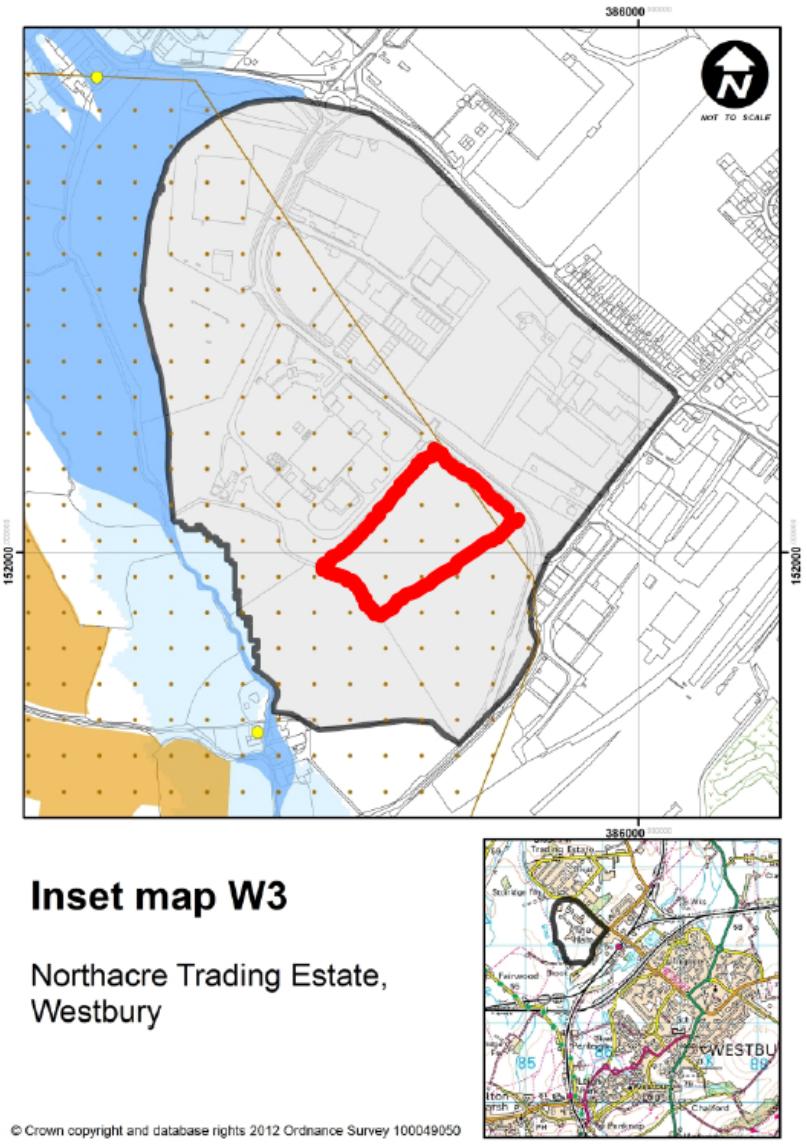
- WDC1 – Key criteria for ensuring sustainable waste management development
- WDC2 – Managing the impact of waste management
- WDC3 – Water environment
- WDC7 – Conserving landscape character
- WDC8 – Biodiversity and geological interest
- WDC9 – Cultural heritage
- WDC11 – Sustainable transportation of waste

Waste Site Allocations Local Plan 2013

- WSA1 – Presumption in Favour of Sustainable Development

- Inset Map W3 – Northacre Trading Estate, Westbury …..

  "Potential Uses – Materials Recovery Facility/Waste Transfer Station, Local Recycling and Waste Treatment"



Wiltshire Core Strategy

Core Policy 32 – Spatial Strategy for the Westbury Community Area
Core Policy 50 – Biodiversity and Geodiversity
Core Policy 51 – Landscape
Core Policy 55 – Air Quality
Core Policy 57 – Ensuring High Quality Design & Place Shaping
Core Policy 58 – Ensuring the Conservation of the Historic Environment
Core Policy 60 – Sustainable Transport
Core Policy 61 – Transport and Development
Core Policy 62 – Development Impacts on the Transport Network
Core Policy 65 – Movement of Goods

National Planning Policy/Guidance

National Planning Policy Framework
National Planning Policy for Waste

Of particular relevance, the NPPW states the following –

"When determining waste planning applications, waste planning authorities should:

……

- consider the likely impact on the local environment and on amenity against the criteria set out in Appendix B[4] and the locational implications of any advice on health from the relevant health bodies**.** Waste planning authorities should avoid carrying out their own detailed assessment of epidemiological and other health studies;

- ensure that waste management facilities in themselves are well-designed, so that they contribute positively to the character and quality of the area in which they are located;

- concern themselves with implementing the planning strategy in the Local Plan and not with the control of processes which are a matter for the pollution control authorities. Waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced; …..".

7. Consultations

Westbury Town Council: Objection.

- *The height of the Chimney is obtrusive.*
- *These plans contradict the Government's National Planning Framework Policy 2 - Environmental aims [e.g. Air quality plan for nitrogen dioxide (NO2) in UK (2017) which increased traffic will make the air quality worse in an area already suffering from poor air quality: and the 25 year environment plan (DEFRA Feb 2018) which sets out to eliminate all avoidable plastic waste by 2042 - using it for fuel works against this aim)*
- *Public health risk – there has been no public health assessment undertaken and Wiltshire Council should consider local residents when considering this application.*

[4] Appendix B of the NPPW sets out 'Locational Criteria' for testing the suitability of sites in determining planning applications. The full NPPW is attached as Annex 4 to this report.

- *Emissions from the site – not all particulates will be collected during the process. We are concerned about the proximity to residential areas and our town. Emissions may conform to current standards but standards regularly change to be more restrictive e.g. there are none for particles PM 1 which will not be filtered. The principle of precaution applies to a site which is close to town centre and whose emissions will regularly cover parts of local residential areas.*
- *There has been no production of a plume grounding diagram, which we were promised and have still not received.*
- *Concerns regarding the practicality versus the reality of the production process from the input streams - testing and modelling is based on proper operation. Evidence suggests (e.g. fires caused by extraneous waste) that recycling processes when carried out outside of "laboratory" conditions results in significant amounts of inappropriate material appearing.*
- *Contrary to Core Policy 42 'Standalone renewable energy installations'. This is a single use site and we do not consider that this is in line with Core Policy 42 as it is not a source of renewable energy.*
- *Contrary to Core Policy 52 'Landscape'. This development does nothing to protect, conserve or enhance the landscape.*
- *Contrary to Core Policy 55 'Air Quality – where development proposals by virtue of nature or location are likely to exacerbate existing areas of poor air quality, will need to demonstrate that measures can be taken to effectively mitigate emission levels in order to protect public health, environmental quality and amenity'.*
- *Contrary to Core Policy 57 'Ensuring high quality design and place shaping'. This was previously turned down on the scale of the proposed building. Whilst we note that there has been some reduction in size, this development is still significantly out of scale with its surroundings.*
- *Contrary to Core Policy 64 (ii) 'traffic management measures'. Increased deliveries to site will result in increased traffic which will have a detrimental impact on local roads and increase pollution with in our Air Quality Management Area.*
- *There has been no pre-planning consultation for this application.*
- *We feel that it is not acceptable to revert to plans from 2014. Attitudes and approaches recycling have changed significantly over the last 4 years and will continue to impact on the future need for this plant.*

Dilton Marsh Parish Council (nearby parish): Objection.

Reiterating the objections made to the previous planning application 18/03816/WCM –

- *The case for public health has not been proven and, until the case has been proven, permission should not be granted.*

And, the following additional comments:

- *Highway safety – increased vehicle movements through an already congested area.*
- *Visual impact on the local area and amenity – for example, the views from St Mary's Lane would be adversely affected.*
- *Scale, bulk and height of the building, which has not been materially reduced by the revised plans.*
- *That the revised plans do not mitigate the reasons for the LPA's refusal of planning application 18/03816/WCM and the original reason for objection still stands, namely that the development is contrary to Wiltshire Core Strategy Policy 51.*

Heywood Parish Council (nearby parish): Objection.

- *The size of the proposed building would have an adverse effect on the appearance of the area and would be contrary to Core Policy 51 which seeks to protect, conserve and enhance the amenity of the landscape.*
- *The proposal is contrary to Core Policy 55 which requires that where development proposals by virtue of nature or location are likely to exacerbate areas of poor air quality, it will need to be demonstrated that measures can be taken to effectively mitigate emission levels in order to protect public health, environmental quality and amenity. The risk assessment gives no comfort about public safety by describing the overall risk resulting from three hazard items of consequence to human health as "not significant".*

Bratton Parish Council (nearby parish): Objection.

Highway safety - Members noted that the treatment facility would generate significant amounts of traffic movements from outside Wiltshire (a net increase of 50,000 tonnes per day) and the resulting increase in lorry movements would present a health and safety risk on already over busy roads in the Westbury area. Furthermore, the significant increase in traffic would further affect the already poor quality of air in the area.

Public Health - The air quality and public health effects arising from the emissions from the development are not clear, especially where the proposed development is sited close to existing and planned residential areas. The precautionary principle should apply where there is such a doubt about short of long term health consequences. Members noted that the parish of Bratton would be affected by the prevailing winds from Westbury.

Also, on design / appearance, the reduction in height of the building is insignificant compared with 18/03816/WCM given its overall bulk.

Frome Town Council: Objection.

This revised application does not address our previous concerns as stated below.

Most of the waste the plant is projected to deal with at full capacity would have to travel long distances and will mean a great deal more heavy traffic through the middle Westbury and the surrounding areas including Frome.

The gasification plant will create pollution: large quantities of CO2 will be generated; as well as particulates, noxious gasses, dioxins and heavy metal vapours all which cause serious health problems.

Emissions from the stack are a huge concern as, even through the chimney will be at height, wind conditions and other weather patterns can influence where the plume emissions go. Not only are we concerned about the residents of Westbury but for Frome and the surrounding areas.

Wiltshire Council Highways: No objection.

I have examined the submitted Transport Assessment and agree with its conclusions that the proposed facility will not have a measurable adverse effect on the highway network. Conditions will be required to ensure the retention of the servicing and parking areas on the site.

Wiltshire Council Landscape: No objection.

Wiltshire Council Public Protection: Previous comments made in relation to 18/03816/WCM stand. Accordingly, recommend conditions.

It is noted that planning permission for this activity has previously been granted under planning reference 14/12003/WCM and this application relates to revisions to layout and design, specifically:

- *Increase height of buildings to incorporate more efficient boiler system and to facilitate*
- *safe access around the boiler plant.*
- *Increase in stack heights to comply with emerging EA guidance on Best Available Techniques.*
- *Enclosing the thermal plant to assist in year-round operations and maintenance.*
- *Separating the waste reception building and the thermal plant to comply with revised standards for fire control*
- *Reducing the number of turbines and the bank of Air Cooled Condensers due to improved efficiencies in the process.*

It is further noted that the application relates to a process that will require an Environment Agency (EA) Permit to operate, under the provisions of the Environmental Permitting Regulations 2016, which embraces the EU Waste Incineration Directive (WID) and Industrial Emissions Directive (IED). We are conscious that if a planning permission were to be granted environmental emissions and impacts from the gasification process and those from the ancillary waste handling activities will be governed by the conditions stipulated in that permit with regard to emissions to air, soil and water. These regulations require the operator to use the 'best available technology' to ensure that impacts from the site are minimised and are compliant with UK and EU air quality and emissions standards. This would form the principle environmental regulatory control over the site and its operations.

Wiltshire Council will be consulted on the permit application in due course and make any relevant observations. More detailed elements of submissions relating to EA technical requirements are for the EA to comment on, as such Public Health & Public Protection Services provides a view on what has been submitted.

Air Quality/Odour – We have assessed this application in context of the Local Air Quality Management (LAQM) framework and are of the view that the Air Quality Management Area (AQMA) in Westbury would not need to be reviewed in light of this application and consider action would not be required in the context of potential breaches of the Air Quality Regulations under the terms of LAQM framework. However we would comment that;

- *Any increase in nitrogen dioxide or PM10 as a result of HGVs or the process is undesirable as Wiltshire Council encourages development to adopt measures to reduce these emissions. We would recommend mitigation or offsetting measures which the applicant can put forward as part of this project e.g. on site and off site EV infrastructure using site derived electricity.*
- *The conservative assumption that all PM10 is PM2.5 is welcomed, as is adherence to a PM2.5 environmental standard. This should be formalised within Environmental Permit for the site.*
- *In relation to odours from the site we are concerned that these have been forecast as being moderately offensive[5] as we would have considered these odours would be more 'landfill' like in character (ref. Table 2.2 of AQA); It is recommended that the applicant*

[5] The ES states that odours have been characterised (i.e. should they be smelt close up) as moderately offensive, but the 'forecast', or assessment, of them in fact concludes that predicted odour impacts are significantly below the level that would give rise to annoyance of 3.0 OUe m-3 and therefore can be screened out as having an impact of 'negligible significance' – see 'Odour' section of this report.

puts forward a scheme of mitigation for controlling odours and monitoring their offensiveness to prevent any impact on amenity. This should also be linked to a 24hr telephone help line that the community can access to report such odours to the operator so that they can be rapidly investigated and mitigated. The capacity for the fitment of additional abatement to the waste air stream stack in respect of any future odour problems needs to be confirmed.

Additional information required –

- *Bio aerosols are covered in the Air Quality Assessment (AQA) and we are aware these will be dealt with subsequently in the EA Permit. Wiltshire Council seeks confirmation as to how this emission from the site will be controlled, monitored or prevented.*
- *Deposition rates have been predicted. Wiltshire Council seeks confirmation as to how these will be monitored over time.*
- *The chapter on mitigation is insufficient in view of the comments above and these issues need to be addressed.*
- *Details of any different emission characteristics during start up periods and whilst the stack reaches operating conditions are required so that the LPA can be reassured of this aspect.*

Noise – A noise report : Acoustics Report A1247 R01B 6th April 2018 has been submitted with the application and the following observations are made:

The report identifies that the type, number and arrangement of the internal noise sources is not known at the time of reporting therefore this remains to be formalised as part of the Environmental Permitting process that will take place independently of this application. The pending permit application with the Environment Agency should cover these.

In the absence of finalised internal noise sources, building element performance data is provided with potential for upgrading where required.

The BS4142:2014 assessment suggests impact significance of this assessment would be considered between Negligible / Neutral to Minor.

The cumulative noise assessment associated with the Northacre Waste Transfer Station Application (ref. 18/03366/WCM) looks at the combined potential impacts of both the WTS & ATT.

Notwithstanding the above, a noise condition is recommended and may subsequently be replicated by Environmental Permitting requirements.

Public Health Comments are also included below:

Public Health – We have liaised with Public Health England (PHE) regarding the application and would echo their response and that of Public Protection that the advanced thermal treatment plant will be subject to a permit issued by the Environment Agency which will govern emissions and impacts from the gasification process and ancillary waste handling activities. We are satisfied along with PHE that the applicant has demonstrated that the proposed development can be carried out without any significant impact on health, subject to compliance with UK air quality and emission standards.

Public Health England - We have consulted Public Health England and their response is attached [at Annex 2 to this report].

Key paragraphs from Public Health England's response follow:

We are conscious that if a planning permission is granted, the activity on site will also be subject to a permit issued by the Environment Agency under the provisions of the Environmental Permitting Regulations 2016. Additionally, emissions and impacts from the gasification process and ancillary waste handling activities will be governed by those conditions stipulated in that permit. The same regulations require the operator to use the best available technology to ensure that impacts from the site are minimised and are compliant with UK and EU air quality and emissions standards. For that reason we have limited our consideration at the planning stage to the principle of land use, a consideration of the Environmental Impact Assessment (EIA) approach adopted by the applicant and type and range of submitted assessments.

PHE Position Statement -

PHE has published a position statement on incinerators but we note that this application is specifically for a gasification process. This process differs from straightforward combustion and consequently the incineration position statement is not considered applicable in these circumstances. Details of the differences between incineration and thermal treatment can be found in the DEFRA publication Energy from waste, A guide to the debate, February 2014 (revised edition), pages 35 to 38.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf

Impacts during construction –

As with any development there may be some localised short term impacts during the construction phase of the project. We note however, that a construction and management plan (CEMP) is included with the application and are happy that such impacts can be adequately managed by normal control measures and the use of industry good practice. Should issues such as noise or dust impacts arise during construction existing regulatory controls are considered adequate.

Air Quality –

The applicant has modelled likely emissions from the site and considered the impact on local air quality. There are a number of sensitive receptors within 2km of the proposed plant including a powdered milk production facility, residential premises, commercial premises, recreation areas, schools and care homes. The submitted assessments have identified these receptors and assessed the impact of a range of emissions from the plant. No significant impacts have been identified in the documentation and PHE is satisfied that the applicant is utilising a model and assessment criteria that are in line with UK guidance and good practice.

There is an Air Quality Management Area (AQMA) in Westbury, declared on the basis of nitrogen dioxide, but we note that the predominant source of NO2 in that area is vehicular traffic. The submitted assessments indicate that the additional contribution from either traffic associated with the proposed development or from stack emissions is likely to be small and consequently is unlikely to have a significant impact on public health.

On the basis of the information submitted with the application PHE is satisfied that the development/process should be capable of operating within the requirements of current UK regulations, air quality standards and emissions standards. Detail of the regulatory control, emissions requirements and monitoring req uirements will be considered in more detail as part of the environmental permitting process; however, on the basis of the information

submitted to date PHE would be unable to sustain any objection to the development on the grounds of air quality.

……

Conclusion –

PHE is satisfied that the applicant has approached the environmental impact assessment in a manner consistent with the UK requirements. They have utilised a satisfactory approach and methodology to predict the likely emissions, distribution of a range of key pollutants and the impact on the local environment and receptors.

PHE will further consider the emissions and appropriate control measures when we are consulted as part of the Environmental Permitting process and will make additional comments at that time. We are however satisfied that the applicant has demonstrated that the proposed development can be carried out without any significant impact on health, subject to compliance with UK air quality and emission standards. For that reason we do not wish to raise any objection to this planning application. ……

Wiltshire Council Conservation: No objection.

Policy/legislation –

From the point of view of the historic environment the main statutory test is the Section 66 of the Planning (Listed Building and Conservation Areas) Act 1990 requirement to have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.

The Council's Core Strategy – 'Core Policy 58: Ensuring the conservation of the historic environment' requires that designated heritage assets and their settings will be conserved. It is also required that distinctive elements of Wiltshire's historic environment, including non-designated heritage assets, which contribute to a sense of local character and identity will be conserved, and where possible enhanced. The potential contribution of these heritage assets towards wider social, cultural, economic and environmental benefits will also be utilised where this can be delivered in a sensitive and appropriate manner.

The NPPF sets out the Government's high-level policies concerning heritage and sustainable development. The Framework makes it clear that a key dimension of sustainable development is protecting and enhancing the historic environment and that in order to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system. Section 16 'Conserving and enhancing the historic environment' is particularly relevant. Paragraph 189 requires applicants to describe the significance of any heritage assets affected including any contribution made by their setting. Paragraph 196 requires a balanced approach to decision making with any harm which would be caused to designated assets being weighed against the potential public benefits which might be achieved.

The National Planning Practice Guidance provides more detailed advice with regard to development within the setting of designated heritage assets as does the Historic England Good Practice in Planning Advice Note 3: The Setting of Heritage Assets (updated 2017).

Issues –

The site is not included within a designated conservation area and contains no major standing heritage. Accordingly, one would not expect historic building issues to be a

dominant factor in the preparation of proposals for the site. However, it is a requirement of the NPPF (para 189) that applications should be accompanied by a heritage assessment which identifies the heritage assets within the area and assesses any impact upon those assets and their settings. In this case it is acknowledged that there is no direct impact upon any heritage asset and the issues will therefore largely relate to consideration of the 'setting' of assets in the vicinity.

The proposals are accompanied by a further update of previous heritage reports. The findings of the various heritage reports are carried through into the Environmental Statement. As previously noted, despite considerable discussion with the Council during the life of the original application, the heritage assessments remain flawed with problems with the original information perpetuated within the more recent submissions which rely on the original work and comment only on changes in impact.

The scope of the studies remains poorly defined and the choice of assets for study rather odd. It is accepted that over longer distances visibility is a relevant issue and that areas of study are thus often initially set using ZTV (zones of theoretical visibility) – however, this should be qualified by a level of professional judgment. The choice of assets in this case however, based upon the ZTV data, seems to follow no logic. Why for example does Park Court at Upton Scudamore, a small manor house sited in a relatively enclosed site within a village and without any indication of a wider designed setting, merit consideration but not Heywood House, which is closer, situated on rising ground and with a designed setting which is clear on mapping, incorporating long views of the borrowed landscape, be omitted? It also remains the case that there is no consideration at all of non-designated assets although para 189 refers to 'heritage assets' in the broadest sense and these should be included.

Having made the selection, the consideration given to the impact on the assets is also flawed. Having noted in the Environmental Statement that intervisibility is not the only consideration, the studies consider the impact of the development almost exclusively in visual terms. The 'significance' of the assets is equated with their value in purely quantitative terms, expressed as a reflection of their designation grade. Little attempt has been made to understand the significance of the assets in the sense currently accepted as being required in conservation assessment (i.e. definition of the nature of the special interest of the building) or to assess the contribution that their setting makes to that significance and the impact that the development will have on this. As a result, whilst I do not necessarily disagree with the final conclusions reached, the reasoning behind them is flawed.

As with the previous applications therefore, I do not consider that the document demonstrates the comprehensive understanding and assessment of heritage impact envisaged by current policy and guidance. However, the NPPF (para 190) also requires the Council to make its own assessment of impact and the previous heritage recommendations were based on such internal assessment. To summarise this assessment on behalf of the Council:

The impact on the settings of the listed Storridge Farmhouse and the highly graded Brook Hall complex will be neutral overall, largely as a result of existing intervening modern industrial development which has already changed and redefined their settings via the presence of urban development…..within the immediate setting in the case of Storridge Farmhouse and slightly wider for Brook Hall. The changed design is unlikely to have any significantly greater impact.

Heritage assets which are further removed from the site which could be considered as having a relationship with the surrounding landscape which renders them particularly sensitive to development within their settings, whether as a result of fortuitous accident or

design - such as churches with spires or country houses with designed settings, are also capable of being negatively impacted by proposed development. In this case, Heywood House is identified as the only likely sensitive receptor. This grade II listed building is a mid C19th country house located within its own parkland, which makes a positive contribution to its significance as a designed setting to the house. The house has wide views over the park and lake to the south, towards the northern escarpment of Salisbury Plan and the Westbury White Horse and a clear design intention of 'borrowing' these views to contribute to the setting of the house can be detected. However, there are no similar designed views to the west and intervening development and geography which will screen the proposed development mean that there is unlikely to be any significant impact on the wider setting of the house on this occasion.*

There are a number of buildings within the vicinity which have the potential to be considered as non-designated heritage assets, by virtue of their age etc.. These include, Brook Cottage (formerly Butler's Cottage) to the north west of Brook Farm and Brook Cottages at the former Brook Mill Farm, the Railway Inn and adjacent former brewery on Storridge Road and Westbury Station. None have been assessed in detail to consider whether they retain sufficient character/integrity to be considered as heritage assets as, in the latter cases, geography and intervening development dictate that the impact on their settings will be largely neutral. Any modest visual impact in the case of Brook Cottage will be limited due to the cottage character of the building which dictates that its immediate garden is likely to constitute its primary focus and setting, with the wider landscape making a lesser contribution. Its wider setting will, in any case, remain primarily rural in feel, albeit that the industrial estate impinges to the north.

However, I do consider that a degree of harm will result to the setting of Brook Farm, including the principle listed farmhouse and its remaining curtilage listed historic outbuildings. A fundamental element in the understanding of the historic character of a farmstead lies with its relationship with the surrounding countryside. The cumulative impact of the new development alongside existing, will contribute to the erosion of the link between the farm and its agricultural hinterland, and the continuation of the process of urbanisation of the rural scene and reduction in tranquillity which may result from noise, vibration and lighting spill from the site. That said, to the east and south of the farmstead the rural landscape remains largely unchanged and the farmstead can still be understood within its agricultural setting. Taking into account the vernacular character of the farmhouse (indicating the house has not been built with a deliberate intention of taking advantage of any particular vistas or views), its orientation and main outlook and the screening impact of the modern farmyard and a modern house to the north and east, as well as the lie of the land which limits the visual impact and provides some mitigation from noise, this harm should be taken to be at the lower end of 'less than substantial harm'.

The original report concluded that there would be "no substantial harm" to any designated asset but acknowledged a "minor negative harm" to both Brook Farm and the adjacent scheduled monument which was taken to suggest agreement in respect of a 'less than substantial harm' which should be tested against paragraph 196 of the NPPF. The more recent updated reports have concluded that revisions to the design will not result in any change in the settings of heritage assets and consequently that there will be no additional harm. In my opinion the revised design, which resulted in a greater mass of development and increased tendency for an overbearing development, will impinge to a slightly greater extent on the setting of Brook Farm in terms of increasing the process of urbanisation of the rural scene. The current amendments will provide only very limited mitigation of these impacts. Other impacts such as those associated with the reduction in tranquillity which may result from noise, vibration and lighting spill from the site will remain much the same. Overall, the impact on the special interest of the building will be largely unchanged from the original assessment.

Conclusion –

The proposals will result in a degree of harm to the setting of the listed Brook Farm, which should be considered as "less than substantial".

It has been made clear in a number of recent cases that it should not be taken to follow that if the harm to heritage assets is found to be less than substantial the subsequent balancing exercise undertaken by the decision taker should ignore the overarching statutory duty imposed by section 66(1). On the contrary, considerable weight should be given to the desirability of preserving the setting of all listed buildings. In addition, the NPPF requires a balanced approach (paragraph 196), with any 'harm' which would be caused to the significance of heritage assets being weighed against the public benefits which may be brought forward by the implementation of the development.

The final planning balance falls to be assessed by the Case Officer, however as previously, it is assumed that the proposed development, which is on a site previously allocated for the purpose, will be considered to have the potential to bring forward substantial public benefits in terms of the contribution to Wiltshire's recycling strategy. On this basis, I consider it likely that the modest and "less than substantial" harm caused to the setting of the listed building will be outweighed. I therefore have no objection to a positive recommendation for the proposed application on the basis of the built historic environment.

Wiltshire Council Archaeology: No objection.

The Wiltshire and Swindon Historic Environment Record shows that the proposed development area (PDA) lies close to sites of archaeological interest. Earthworks of a deserted medieval village have been mapped from aerial photography and field survey adjacent to the proposed development site, which mark the remains of Broke village recorded in the 13th century. The main part of the settlement site is nationally designated a Scheduled Monument (ref. 1019386) and is situated approximately 300m west of the PDA. Brook Farmhouse is a Grade II Listed Building (ref. 1180471) and lies just over 200m southwest of the PDA.

The proposed development site was investigated by archaeological evaluation in 1999 and though a number of archaeological features relating to medieval settlement were identified further to the west, no archaeological activity was encountered in the trenches within the area of the proposed development. I therefore do not consider there to be any requirement for further archaeological investigation.

Wiltshire Council Drainage: No objection.

Wiltshire Council Ecology: No objection.

I note that there is an extant permission for this plant from 2014 (14/12003/WCM) and that the current application is to revise the layout given under the 2014 permission.

The site is an allocated waste site, included in the Development Plan Document for Wiltshire Waste Strategy and assessed for this usage under the Habitats Regulations at the DPD consultation stage. The proposed revision to the layout and design would not result in any mechanism for adverse effect on the favourable conservation status of any Natura 2000 site within the distances agreed with Natural England for adverse impacts from waste facilities. There is therefore no reason to revisit the Habitats Regulation Assessment and the previous conclusion of "no likely significant effect" still stands.

The application site lies within an existing industrial estate, set on a base of concrete and compacted stone. There is little natural vegetation other than around the very edges of the site. The proposals include some enhancements for biodiversity including habitat planting in spaces around the edges of this very constrained site. I am happy that the proposal will not result in any adverse effects to ecologically sensitive habitats or species and that some enhancement for biodiversity will result from the proposed works.

Environment Agency: No objection.

This application is for a revision of the layout and design of an Advanced Thermal Treatment Facility consented under Planning Permission 14/12003/WCM.

Environmental Permitting –

As stated in our response to the original application, the proposed development includes the incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.

The proposed changes to the height and layout of the development will have an impact on the results of the previous Air Quality Assessments submitted under previous applications. We note that an Addendum to the February 2018 Air Quality Assessment has been submitted. The Environment Agency is only able to assess the revised Air Quality Assessment once it has been submitted to us as part of a valid environmental permit application.

Informative - This activity will require a bespoke installation environmental permit issued by the Environment Agency (EA). As part of the environmental permitting process, the EA assess all applications to ensure that they meet the requirements of the Environmental Permitting Regulations. During assessment, the design of the plant is reviewed, as well as how it will be operated, the emissions it will generate (to air, water and land) and whether emissions will have an adverse impact on people living nearby and the natural environment. The EA do this by consulting partner organisations, such as Natural England (experts on impacts on wildlife) and Public Health England (experts on human health impacts). Emissions limits and techniques used to protect the environment and human health are set by the EU Industrial Emissions Directive (IED). In order to achieve the limits set by the IED the operator will need to show that they will use Best Available Techniques (BAT). The EA cannot set environmental permit conditions that go beyond what is specified by the IED and BAT.

Natural England: Do not wish to offer any comments.

Historic England: Do not wish to offer any comments; case to be left to local advisers.

8. Representations

The planning application has been publicised by local advertisement, site notice and letters to neighbours. This has generated 526 representations (at 07/01). Of these 520 are objections, including from Molly Scott Cato MEP, and 5 are supports. Bradford on Avon Preservation Trust expresses 'concern'.

The **objections** are summarised as follows:

- Principle – this is an 'incinerator' and not a 'recovery facility'. EA 'R1' status required for recovery; as no R1 certificate in place, this is 'disposal' at bottom of Waste

Hierarchy. No information provided as to technology provider; so unclear if Best Available Technology is to be used. Such developments better located close to major roads (e.g. M4). Contrary to sustainable principles of the NPPF. Contrary to Wiltshire Waste Core Strategies and Wiltshire Core Strategy. No business case for the facility; no demonstrated local need – waste material would be imported from other counties. 'Due diligence' studies are required by WC to determine acceptance or otherwise of regional nature of proposal, impact of PMs (particulate matter) on health, effects of plume grounding on Westbury & implications for Westbury AQMA. Changed circumstances since 2015 permission – additional homes in Westbury, need for incinerators in UK met, changed knowledge about health impacts. Contrary to Waste Core Strategy.

- Technology – applicant should be putting recycling first. Advances in technology means that this facility is out of touch; a lot will happen during the 25+ yr life expectancy of the plant, meaning that it will be out of date very soon.
- Traffic generation – Increase in traffic in general in Westbury – this will add to the congestion problems; increase in heavy vehicles in The Ham. Pollution from traffic. Inadequate regulation of traffic. Increased likelihood of collisions. Increase in HGV's harmful to other businesses and tourism. Contrary to Core Policy 62.
- Health concerns – pollution from process would contaminate ground and air. Insufficient demonstration that there would not be harm; impacts not really understood; regulation always behind science; no recent research or reports. Should not be sited in an urban area; prevailing wind direction from west would push plume over town. Site next door to food factory – potential for contamination. Site close to schools and houses. Westbury becoming 'dumping ground' for such developments. Similar proposals rejected elsewhere. No Health Impact Assessment with application. NOx is extremely harmful to health; quantities cannot be averaged out over time. Effects of other chemicals to be burnt with residues discharged as a plume are unknown. Plume grounding can occur anywhere, with effects unknown. Effects of fine particles (<2.5PM) not known and/or damaging to health – they cannot be removed by filters. Large body of literature on the potential adverse health effects of different waste management options, particularly from incineration. Ash bi-product of process difficult to dispose of; same with contaminated water from process. Benefits of removing cement works (and its visible pollution) would be lost. Topography of area not conducive to plume dispersal. Modelling based on data collected miles from site; modelling vague. Health & Safety at Work Act relevant. Contrary to Core Policies 42 and 55;
- Westbury AQMA – already too much pollution, hence the AQMA. Proposal would add to this contrary to its purpose. WC not fulfilled legal duty to address issues relating to AQMA. Bath clean air project will add to Westbury's air quality issues.
- Landscape / visual impact – large buildings & tall stacks harmful to views. Only just got rid of cement works chimney; eyesore. Harmful to setting of White Horse. Arla Dairy building already a 'blot'; a further blot should not be added. Over-bearing.
- Ecology – close to lakes and open land which are havens for wildlife. Badger sett on site. Liquid run-off harmful to watercourses.
- Design – poor; over-development; stack intrusive at 75m. Harmful to landscape/visual amenity. Contrary to Core Policy 51.
- Economic impacts – would put off new business' from coming to Westbury. Harmful to existing businesses, particularly those involved in tourism/catering. Effect property values.
- Sustainability – incinerating waste would discourage re-cycling, composting, re-use, etc.. Not conducive to saving the planet. Alternative approaches to waste recovery should be considered first. Insufficient waste available to allow ATT to run effectively – meaning import of waste from elsewhere and/or materials that should be recycled be used. Viability of ATT's should be considered – planning permissions elsewhere

have been abandoned.

- General amenity – Noise: disturbance to nearby residents; odours: process would generate smells; fly nuisance. Hawkeridge: amenities affected by traffic;
- Regional development – the facility would process waste from beyond Wiltshire. Insufficient quantities of waste in Wiltshire to justify the development.
- Safety – applicant has poor record in terms of fires, flies, odours. Potential explosion risk.
- No information relating to connection to grid – where? How?
- Planning history – previous application (18/03816/WCM) refused. 2015 planning permission (14/12003/WCM) for ATT irrelevant now. Apparent confusion at July SPC meeting must not happen again.
- Wiltshire Council – the Council's interests should not override proper planning.

Bradford on Avon Preservation Trust: Comments - *Although this site is located at a distance from Bradford on Avon we are concerned about the visual impact of the chimney from distant points in the landscape. We seek to ensure that consideration is given to views from the hillside at Bradford on Avon.*

The objections from Molly Scott Cato MEP are as follows:

I am writing to lodge my objections to the proposed Advanced Thermal Treatment Facility (ATTF) in Westbury. As MEP for the area, I have been contacted by a number of Westbury residents who are very concerned about the plans for the plant.

I also submitted objections to the previous application, Reference Number 18/03816/WCM, in June 2018. From my understanding of this new application little has changed beyond the height of the buildings, so my reasons for objection remain unchanged.

Overcapacity of waste treatment plants –

Independent reports have for several years now identified an overcapacity of waste treatment by 2021 in the UK as ever more plants are planned and built (Residual Waste Infrastructure Review Issue 12, Eunomia), and we are also heading towards overcapacity across Northern European countries from 2030 onwards too.

The UK is still working towards a 50% recycling target for household waste by 2020 as part of the Waste Framework Directive, and the growing non-recycling treatment capacity for that waste will threaten the UK's ability to meet recycling targets as plants require feedstocks.

While the reduction in waste going to landfill is welcomed, swapping landfill for other treatment options, such as Advanced Thermal Treatment is not tackling the root cause of the waste problem which is an over production of products that quickly become waste rather than being part of a circular economy. The existence of plants such as the proposed ATTF in Westbury removes pressure to transform our thinking about manufacturing and using materials so that we do not produce waste. With the growing public awareness of plastic pollution and rising distaste for single use plastics, the approval of yet another ATTF looks spectacularly outdated and unambitious.

On a recent visit within the constituency I was shown a new product that is made from plastic waste that cannot be recycled. Rather than being landfilled or undergoing thermal treatment, it is used to form another product that serves a useful purpose and displaces some particularly unsustainable and environmentally unsound products. Achieving a circular economy is close, we need to support the transition to it, not provide distractions from it.

Air Quality –

The growing concern with air quality and the third High Court judgement against the Government's weak plans to tackle air pollution across the country makes the construction of yet another treatment plant that will contribute to poor air quality look naïve and irresponsible. Despite the reassurances that can easily be given as to correct operation and subsequently low emission levels, the reality is that errors do happen, and one breach can have catastrophic consequences for those with already poor lung function.

In addition to the particulates and dioxins, albeit at low levels, released in the treatment process itself, the plant would create many additional HGV journeys into the town to bring feedstocks to the plant. In a town that already has an Air Quality Management Area which experiences occasional breaches of legal levels it is utterly irresponsible to increase traffic levels further. Not only will air quality be diminished as a consequence of the additional traffic, but so will quality of life for residents along the route due to noise, the potential for greater congestion and general safety levels.

The claim by ATTF that it provides a 'renewable' source of energy cannot be taken seriously. If ambitious recycling targets were part of a truly circular economy, there would be very little feedstock available to power these plants demonstrating they are not truly renewable. Even if, in our current economy, large amounts of waste are produced this is by no means a clean low carbon renewable source of energy in comparison with solar radiation or wind power for instance. Greenwashing of this sort does no-one any favours and delays our progress towards a truly low carbon renewable economy with air quality that is suitable for all citizens.

The council needs to make the bold decision of turning this application down and signal the need to move to a circular economy that produces far less waste that needs this kind of treatment. The argument that it will produce jobs neglects the fact that in a circular economy where waste is regarded as a resource and properly sorted, reused, recovered and recycled, jobs are created to carry out these 'waste' processing functions.

The plans for this Advanced Thermal Treatment Facility demonstrate an outdated view of tackling waste that will not move us to the circular economy or clean air that citizens deserve now and in the future.

The **support** is summarised as follows –

- Government policy - until measures are in place to reduce the amount of waste, particularly plastic waste, it is better to produce electricity from it than to put it into landfill. There are increasing efforts to recycle some waste but again until these are efficient enough to deal with this very sizeable issue, it is better to produce electricity from it.
- Technology – good use of technology; no issues relating to traffic, smells, etc. from similar facilities existing elsewhere. Duty to deal with our waste. Will complement existing facilities at the site.

9. Planning Issues

The main issues to be considered in this case are firstly the principle of the proposal in the context of the existing consent for an ATT facility and the site allocation as both employment land and as a strategic waste site; and then, assuming the principle is accepted, the impact of the specific scheme on detailed matters, including traffic/highway safety, landscape/visual amenity, heritage assets, and residential amenity (including the effects of noise, odours,

flies, emissions, etc.).

The Environmental Statement, together with any other information which is relevant to the decision, and any comments and representations made on it, must be taken into account by the local planning authority in deciding whether or not to grant permission for the proposed development.

9.1 Principle

On the issue of the principle of the development, it is material here that planning permission has already been given for an ATT facility at the application site. The proposal is to effectively revise the approved scheme as a consequence of advances in technology and changes to regulations. As the previous planning permission remains extant, and as there have been no material and/or relevant changes to planning policy since the planning permission was granted (this including the publication of the revised National Planning Policy Framework in July 2018), significant weight must be given to it as a material consideration.

Policy WCS1 ('The Need for Additional Waste Management Capacity & Self Sufficiency') of the Wiltshire & Swindon Waste Core Strategy 2009 states that over the plan period to 2026, Wiltshire and Swindon will address the issue of delivering sufficient sites to meet the needs of the municipal waste management strategies and sub-regional apportionments by providing and safeguarding a network of Site Allocations, this to manage the forecast increase in waste associated with the planned growth in the Strategically Significant Cities and Towns (SSCTs) of Swindon, Chippenham, Trowbridge and Salisbury. It further states that the need will be met locally whilst balancing the importation and exportation of waste within the principles of sustainable development and in accordance with the principles of sustainable transport.

Policy WCS2 ('Future Waste Site Locations') addresses, at a strategic level, how and where the need for the additional waste management capacity identified by Policy WCS1 will be met. The policy's explanatory notes set out two levels, or tiers, of waste management facilities – that is, those that are of a 'strategic' scale and those that are of a 'local' scale.

Strategic waste management facilities are defined as large and/or more specialist facilities that operate in a wider strategic manner by virtue of spatial scale, high tonnage of waste managed, specialist nature of the waste managed and/or a wider catchment area served. They are generally considered to include:

- Strategic materials recovery facilities (MRFs)
- Strategic composting facilities
- **Energy from waste facilities (EfW)**
- Mechanical biological treatment facilities (MBT)
- Landfill

The explanatory notes with the policy state that "*It will be expected that strategic facilities would serve either large areas within, or the entire Plan area. Additionally, they may also serve areas of Wiltshire and Swindon and surrounding local authorities in a more sub-regional context. Such sites will have characteristics that will prevent them from being accommodated on small and/or sensitive sites and locations …..*". The policy states that strategic waste site allocations will be located as close as practicable ("… within 16 km …") to the SSCTs of Swindon, Chippenham, Trowbridge and Salisbury.

In accordance with Policies WCS1 and WCS2 the Waste Site Allocations Local Plan 2013 allocates land/sites for waste uses. The Northacre Industrial Estate and some of the adjoining countryside, which lie approximately 6.5 km to the south of Trowbridge, are defined

in the Allocations Local Plan as an area suitable for strategic scale "*materials recovery facility/waste transfer station, local recycling and waste treatment*" type uses. The Waste Development Plans define 'waste treatment' as including Mechanical Biological Treatment, Anaerobic Digestion, Energy-from-Waste, and Combined Heat and Power facilities. In line with this, the estate already supports the MBT plant, and there is the further extant planning permission for an energy from waste plant (an ATT facility) on this application site, both of which are / would be strategic scale waste treatment facilities.

In terms of Policy WCS2, the proposal in this application – which is for a revised EfW (ATT) facility – is/remains a strategic waste management facility. On the basis that strategic scale waste management facilities are acceptable in this industrial estate allocated as suitable for such facilities, the proposal complies with the requirements of these aspects of the Waste Core Strategy and the Waste Site Allocations Local Plan as a matter of principle. Additionally, as Policy WCS2 allows strategic facilities to serve 'large areas' (that is, areas within the Plan area or the entire Plan area *and* within surrounding local authorities "… in a more sub-regional context ….", the operation of the AAT's in this way, if ever intended, would not conflict with the policy.

All of the above conclusions in respect of the principle are effectively confirmed by Policy WCS3 ('Preferred Locations of Waste Management Facilities by Type and the Provision of Flexibility') which, in setting out preferred locations for the different waste facility types, states that energy from waste facilities should preferably be located on 'industrial land / employment allocations' and 'site allocations and current waste management facilities'.

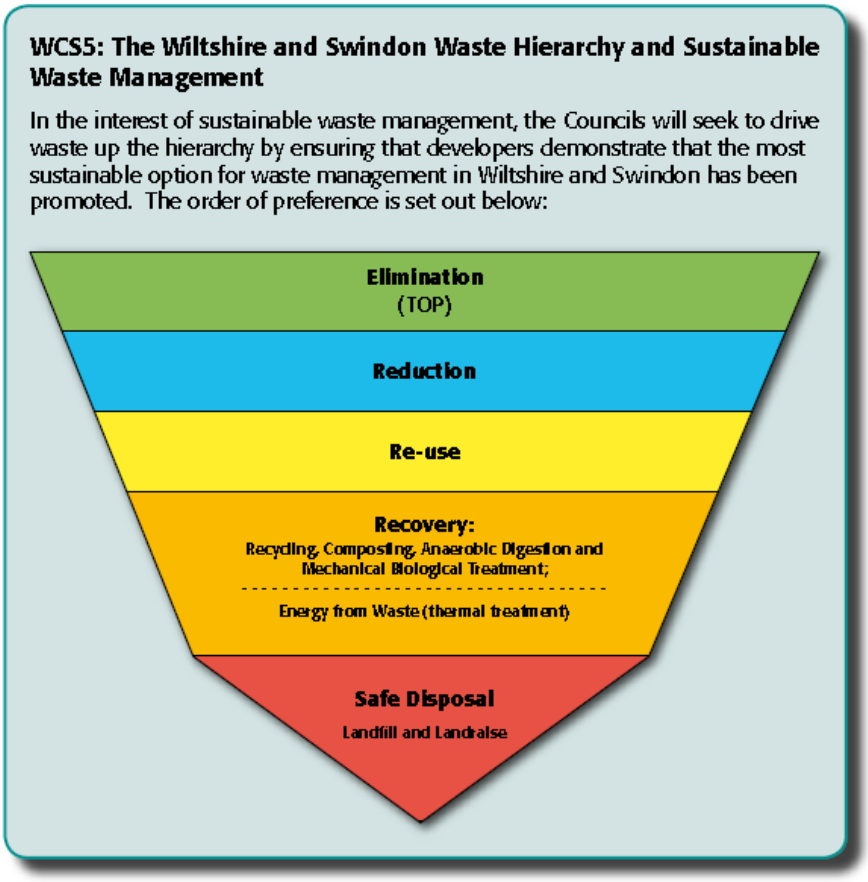
The Wiltshire and Swindon Waste Hierarchy -

Policy WCS5 ('The Wiltshire and Swindon Waste Hierarchy and Sustainable Waste Management') of the Wiltshire & Swindon Waste Core Strategy provides an order of preference, or hierarchy, for waste disposal in the interests of sustainability. The purpose of the hierarchy is to bring to the fore the preference for 'elimination' over other forms of waste management; the hierarchy is not intended to bar all other forms of waste management. Presently energy from waste remains a relevant 'recovery' form of waste management which, in the hierarchy, is preferable to landfill and land-raise ('disposal').

Some representations received contend that the proposal is for an 'incinerator' and not a 'recovery facility', and that Environment Agency 'R1' status is required for recovery. The term 'R1' refers to a classification contained in annexes included in EU Waste Framework Directive (WFD) which set out lists of what are considered to be recovery or disposal operations. The WFD sets out the waste hierarchy and it requires that a waste management route defined as recovery should be used ahead of an alternative that is classified as disposal. R1 status means that an EfW plant is classed as a 'recovery' facility rather than a disposal facility. The criteria for achieving R1 status is set out in the WFD and acts as a performance indicator for the level of energy recovered from waste. The Environment Agency (EA) is responsible for the R1 certification process, which is separate to the environmental permitting regime operated by the EA, and the planning application process. Operators of UK plants do not have to obtain R1 status, however in a guide to EfW published by DEFRA it was advised that for planning purposes operators "strive towards demonstrating that energy from waste is a recovery operation according to the WFD definitions". In the case of Northacre, the applicant has confirmed within the ES that the proposed development is defined as a recovery operation by the WFD and is in accordance with its aims.

It should be noted that the Waste Framework Directive (WFD) does not specify a minimum level of energy efficiency for recovery facilities primarily dedicated to the processing of non-municipal solid waste, such as this that will deal with commercial and industrial waste.

The Waste Management Plan for England identifies 'gasification' as a 'other recovery' operation, alongside anaerobic digestion, incineration with energy recovery and pyrolysis which produce energy (fuels, heat and power). Similarly, the adopted Wiltshire and Swindon Waste Core Strategy (Policy WCS5) identify EfW (thermal treatment) as 'recovery', as shown below. The Waste Core Strategy does not require energy from waste proposals to achieve a specific energy efficiency threshold in order to be classified as recovery operations.



9.2 Landscape / Visual Impact

This detailed matter is considered first in view of landscape and visual impact being the single reason for refusal in the last planning application.

Policy background –

Core Policy 51 ('Landscape') of the WCS re-states that new development should protect, conserve and where possible enhance landscape character, with any negative impacts mitigated as far as possible through sensitive design. The policy states that proposals should be informed by and be sympathetic to the distinctive character areas identified in the relevant Landscape Character Assessment(s) and any other relevant assessments and

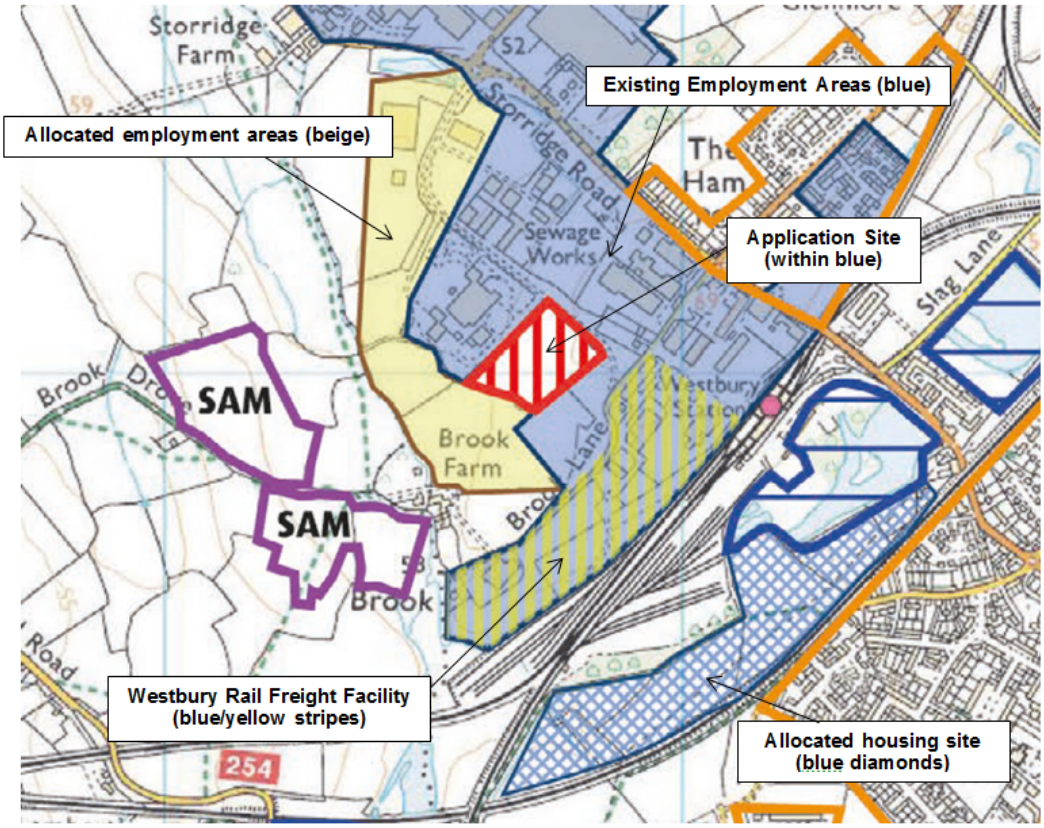
studies; and proposals will need to demonstrate that the following matters in particular have been taken into account and landscape conserved and enhanced as appropriate:

- The separate identity of settlements and the transition between man-made and natural landscapes;
- Visually sensitive skylines, soils, geological and topographical features;
- Landscape features of cultural, historic and heritage value;
- Important views and visual amenity;
- Tranquillity and the need to protect against intrusion from light pollution, noise and motion; and
- Landscape functions including places to live, work, relax and recreate.

The Wiltshire and Swindon Waste Development Control Policies DPD Policy WDC7 (Conserving Landscape Character) further requires proposals for waste management development to include an assessment of the adverse impacts on the landscape character, this informed by the Wiltshire Landscape Character Assessments. The policy states that proposals for waste management development should include appropriate provisions to protect and where possible enhance the quality and character of the countryside and landscape, and proposals in proximity to settlements must safeguard their character, setting and rural amenity through the implementation of mitigation measures that incorporate an acceptable separation distance, landscaping and planting, appropriate to the existing landscape setting.

Core Policy 57 ('Ensuring high quality design and Place Shaping') provides more general development control standards, requiring new development to, in particular, respond positively to existing townscape and landscape features in terms of building layouts, built form, height, mass, scale, building lines, etc., to effectively integrate development into its setting. It also requires the retention and enhancement of existing important landscaping and natural features, including trees, hedgerows and watercourses.

Meanwhile, Core Policy 35 ('Existing Employment Sites') seeks to retain the defined Principal Employment Areas in employment uses, and supports renewal and intensification of employment uses thereon; and Core Policy 32 ('Spatial Strategy for the Westbury Community Area') allocates 3.8 ha of new employment land at Northacre Industrial Estate on land to its west side (that is, adjacent to the application site). These designations are illustrated on the following plan contained within the Landscape and Visual Impact Assessment (LVIA) with the planning application (with annotations added).



Extract from LVIA 'Site Location and Planning Context Plan' showing Core Strategy designations within vicinity of site (annotations added)

2018 refusal and resulting revised application –

As already set out, in July 2018 the Strategic Planning Committee refused planning permission for an alternative ATT facility to that approved previously, the single reason for refusal relating to the harmful visual impact on the wider area and landscape, this by reason of the height, bulk and location (on rising ground) of the proposed development. As a consequence of this reason for refusal the current application proposes a revised layout and design. The main changes are as follows:

- Re-profiling and regrading of the site to reduce the base (finished floor) level of the site from a sloping site at 64.7m AOD (with a slope to the west) to a level site at 62.0m AOD.
- Reduction in the height of the process buildings.
- Changes to the layout which move the waste feedstock and preparation building away from the south west corner of the site.
- Reduction in total building footprint by 376 sq m.
- Adoption of a bespoke colour scheme to break up the mass of the buildings and reduce their visual impact.

The height of the whole development will be lowered by re grading of the site by around 2 m average. The maximum height reduction of the main building is slight – from 37.8m to 36.8m – but this is material in the context of other changes to layout and colours of the external materials. Changes to layout reduce significantly the bulk of the rear elevation facing west towards the open countryside, and reduce the overall footprint of the main

building. On external material colours, it is now proposed to use shades of grey and green. The reasoning is explained in the Environmental Statement as follows:

> "The colours and finish have been selected to reduce the overall visual mass of the built elements, by breaking them up into discrete elements which helps them blend better with the landscape / skyscape. The colours chosen are a mix of greens and greys – the green tones in particular minimise the degree of contrast with the landscape.
>
> Whilst the colours selected for the approved development (14/12003/WCM) were designed to match those of the Northacre Resource Recovery Centre immediately to the east, the current proposals are deliberately different to provide a contrast and reduce the visual mass. ….".

Landscape and Visual Impact Assessment –

The application is accompanied by a revised Landscape and Visual Impact Assessment (LVIA) (October 2018) which assesses the impact of the changes in the current application. It does this by applying established LVIA methodology - to define baseline conditions, and then to assess the landscape and visual effects of the proposal. It also considers mitigation as necessary, and the residual effects (that is, those effects likely to be reduced over time as a consequence of proposed tree planting or other factors).

Landscape effects –

Landscape character is defined in the LVIA as "*the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place experienced in different areas of the landscape*". The degree to which a particular landscape type or area can accommodate change arising from a particular development, without detrimental effects on its character, will vary with:

- Existing land use;
- the pattern and scale of the landscape;
- visual enclosure / openness of views, and distribution of visual receptors;
- the scope for mitigation, which would be in character with the existing landscape, and
- landscape value.

Overall landscape impact is determined by combining the sensitivity of the landscape resource with the magnitude of landscape change.

In terms of baseline conditions, the site is located within the 'Avon Vale' National Landscape Character Area. Locally, in 2007, the West Wiltshire District Landscape Assessment (WWDLA) classified the area in which the site is located as being within the 'Heywood Rolling Clay Lowland' landscape character area (WWDLA ref. 'LCA E8'). The WWDLA sets out its characteristics as being:

- Gently rolling topography of the area slopes gradually downwards, moving southwards towards Westbury;
- Human influence strongly visible in the form of West Wilts Trading Estate and junction of two main railway corridors;
- Rural character disturbed by noise and visual intrusion associated with the railway corridors, roads and West Wilts Trading Estate;

- Combination of small, medium and large, farmed fields surround the trading estate, the boundaries of which are delineated by hedgerows in varying condition;
- A series of interconnecting minor roads cross the area;
- Settlement pattern dominated by nucleated arrangement of large warehouses within West Wiltshire Trading Estate but scattered farmhouses to the north and west;
- Generally, a low level of tranquillity throughout the area due to the main roads, the railway corridor and Trading Estate.

The open countryside immediately to the west of the site is located in the 'North Bradley Rolling Clay Lowland' landscape character area (WWDLA ref. 'LCA E3'). Its key characteristics as defined in the WWDLA are:

- Gently rolling farmland based on clay, with extensive views, including views on the chalk downland in the east and south;
- Distinct pattern of small to medium sized fields enclosed by mainly intact hedgerows with mature trees;
- Predominantly pasture with a few scattered ancient woodland blocks;
- Settlements consist of several villages and farmsteads linked by a dense network of mainly secondary roads and footpaths;
- Pylons as a dominant vertical element.

The relevant management and landscape objectives summarised in both of the Landscape Character Assessments focus on conserving landscape diversity and mitigating the "urbanising influence of large towns". They include:

- Managing existing vegetation and planting new woodland to maintain the enclosed character and screen views of intrusive urban edges;
- Developing guidance to ensure that new building and alterations to existing buildings integrate with the character and structure of settlements;
- Seeking of landscape enhancements from trading estate developments and screening of visual distractors.

The LVIA continues by considering the local landscape context of the application site within the wider landscape character areas. It notes, in particular, that:

- The site is situated in the Northacre Trading Estate, which forms part of a significant urban extension north-west of Westbury town centre, and which exerts a significant impact on the open countryside beyond, this in terms of visual amenity, noise and light pollution;
- The site is situated adjacent to open countryside albeit that the countryside immediately to the west is zoned for further employment use (Core Policy 32);
- The site benefits from an extant planning permission for an ATT facility.

Having regard to these baseline conditions, the LVIA sums up the local landscape context of the application site as follows:

> "As a result of the heavily developed and disturbed nature of much of the area immediately surrounding the site it is generally overall deemed, when the adjacent open countryside is taken into consideration, to be an ordinary landscape area (one which contains some features of visual value but generally lacks a coherent and aesthetically pleasing composition). Consequently it is considered to be of medium sensitivity[6] and some

[6] Landscapes of medium sensitivity are defined in the LVIA as commonly occurring landscape areas with some evidence of alteration or degradation of the character or features, and potentially tolerant of some change and likely to be locally valued.

potential to accommodate further change, as vacant plots are developed and the estate expands westwards onto the adjacent agricultural land".

In assessing the character the LVIA further adds that the countryside to the west of the site, although exhibiting many of the characteristics identified within the character assessment profiles (referred to above), has been eroded by the extensive development that has taken place within the industrial estates, including the related infrastructure and lighting.

Landscape effects: LVIA conclusions –

In conclusion on landscape effects the LVIA, therefore, states the following –

"6.2 ….. the site itself, is located on the existing Northacre Trading Estate within the E8 (Heywood Rolling Clay Lowland) LCA …. As previously referenced the existing agricultural land to the west has been allocated for employment uses in the Core Strategy adopted by Wiltshire Council. When the wider context of the adjacent industrial estates is considered this development is compatible with its landscape setting filling in a gap between two existing industrial facilities and helping to reinforce the urban / rural boundary. However, it does in terms of the size of its constituent structures (including the stack) represent a relatively significant development.

6.3 Because of the absence of any significant vegetation and the recent disturbance ….. there are no direct physical impacts on valuable landscape fabric resulting from this development. It is assumed that the existing hedgerow on the southern boundary will be largely retained and subsequently protected during the course of construction works. Consequently, there is deemed to be no significant impact in this regard.

6.4 Although the current scheme is (like the 2015 consented scheme) large scale and non-reversible in nature, the magnitude of landscape change …. is categorised as No Change to Low Adverse for the site and the adjoining trading estates because:

- It is located on relatively unsightly, disturbed land on an existing industrial estate and is totally compatible with adjoining land uses;
- it is located on a brownfield gap site and will serve to reinforce the existing urban edge of Westbury as stipulated in core strategy CP51 …..;
- the existence of large-scale visually prominent industrial buildings to the north-west and south-east of the site mean that it is considered that this development will only result in a minor loss of its existing character, (largely due to the presence of the stack and the scale of the buildings);
- the proposed landscape treatment …… will partially screen views of the development from the highway and other areas of the trading estate.

6.5 Consequently the significance of landscape effects, for the site and trading estates (ie. areas within the E8 LCA) can be deemed to be Slight Adverse[7], at most.

6.6. In relation to this development there is deemed to be, taking into account the increased volume of built form and the predicted low levels of associated lighting and noise impacts, a minor to partial alteration to the key characteristics or features of the countryside that immediately adjoins the site (….. within the *North Bradley Rolling Clay Lowland* LCA) [WWDLA ref. LCA E3]. Overall the magnitude of landscape change for the open

[7] A 'Slight Adverse' effect is where the development does not quite fit the landform and scale of the landscape. Notably, although not visually intrusive, the development will impact on certain views into and across the area; and it cannot be completely mitigated because of the nature of the proposal itself or the character of the landscape through which it passes.

countryside to the south-west and north-west of the site is deemed to be Medium Adverse, due to the following factors:

- the height and scale of the visible structures (although these are likely to be partially screened over time by development on the designated employment land located to the south-west and north-west) which significantly reduces the amount of skyscape visible between the existing pollarded willows located along the Biss Brook;
- there is anticipated to be no light spillage from this development into the adjacent agricultural field and it is understood that measures will be taken, to keep noise levels within acceptable limits.

The magnitude of change is not considered to be high because:

- The landscape proposals associated with the development incorporate a screen mound in the south-western corner of the site …, augmented by predominately native species trees and shrubs along most of the southern boundary;
- the landscape character is already defined by industrial development at its urban edge. This has already been degraded by the adverse effect of Westbury Dairies, and to a lesser extent other trading estate buildings located either side of it;
- the retention of the hedgerow on the south-west boundary means that there will be no associated physical impacts (and hence no alteration of the existing field pattern) on the LCA**.**
- the site will not ultimately be located on the boundary of the area allocated for employment once the land to the west is developed for this purpose, as indicated in the adopted core strategy.

6.7 Since the open countryside to the south-west and west (ie. areas within the E3 LCA) has consequently been deemed to be of Medium Landscape Sensitivity as discussed above, the overall level of landscape effect has been categorised as Moderate Adverse[8].

……..

6.9 In comparison with the (2015 scheme) future baseline scenario the current proposed configuration is considered to represent a minor deterioration in landscape quality of the open countryside (E3 LCA) due to the overall greater mass of the buildings, something which is considered to further erode the rural characteristics of the existing landscape. Consequently there is considered to be a Small degree of magnitude of change with a resulting Slight Adverse landscape effect".

These conclusions of the LVIA are agreed. Notably, that the effects of the proposal on the Heywood Rolling Clay Lowland landscape character area (which in the locality of the application site is essentially the Northacre Industrial Estate) would be 'Slight Adverse', whereas the effects on the North Bradley Rolling Clay Lowland landscape character area (which is essentially the presently open land to the west of the industrial estate) would be 'Moderate Adverse', although this reducing to 'Slight Adverse' when the extant planning permission is factored-in.

A Slight Adverse effect is where development does / would impact on views and cannot be fully mitigated. In the context of this industrial estate, where there are established industrial buildings – some sizeable and themselves presenting a slight adverse effect – a further

[8] A 'Moderate Adverse' effect is where the development is out of scale with the landscape, or at odds with the local pattern and landform. Such effects are not possible to fully mitigate for, that is, mitigation will not prevent harm to the landscape in the longer term as some features of interest will be lost or their setting reduced or removed; and they will have an adverse impact on a landscape of recognised quality or on vulnerable and important characteristic features or elements.

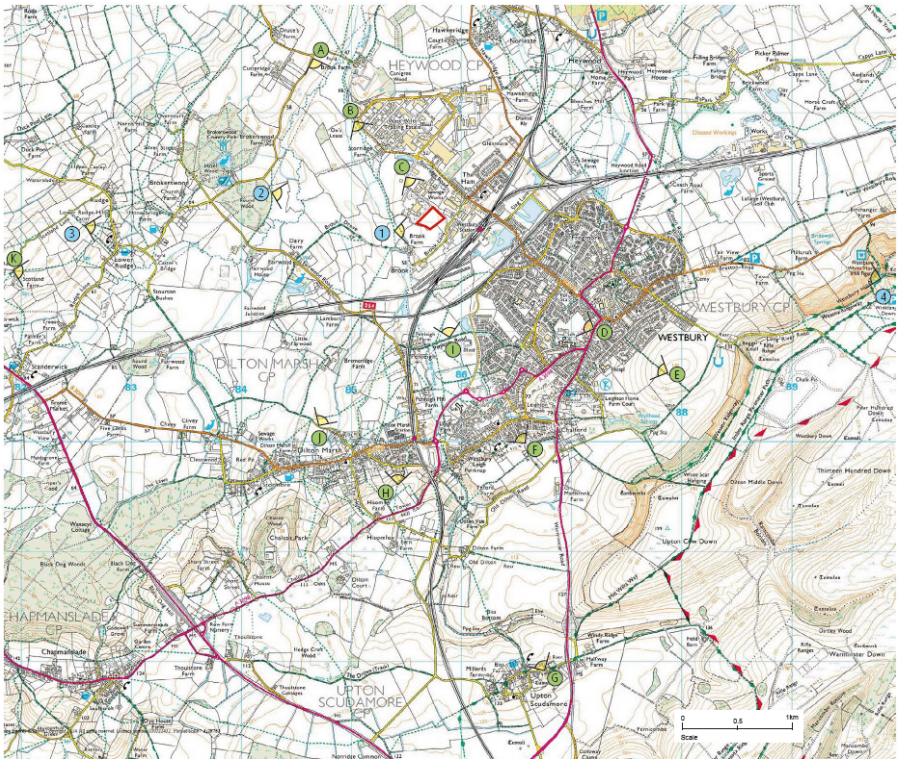
industrial building presenting a further slight adverse effect, is not considered to be inappropriate or out of keeping. Indeed, It can be reasonably said that this industrial estate is now an established location for such developments.

A Moderate Adverse effect is where there is a greater impact than Slight Adverse, this as a consequence of, in particular, the scale of development/proposed development being at odds with the pattern and landform of the landscape. In this case, and notwithstanding the harm arising from the moderate adverse effect identified, the proposal is considered to be acceptable, this in view of the proximity of other sizeable industrial developments (including the Arla Dairies complex) and their not dissimilar impacts to those of the proposal. The moderate adverse effect is also considered to be acceptable in the context of the additional employment land allocation to the west of the site – this will inevitably further change the character of the 'countryside' hereabouts, and in view of its area – 3.8 ha – have a likely greater than slight adverse effect on the LCA in any event. Also particularly relevant to the acceptability of the proposal in this context is the 'fall-back' position of the extant planning permission, albeit for lower buildings. The LVIA concludes that when this future baseline scenario is factored-in, the current proposal actually represents a smaller degree of magnitude of change with a resulting change to Slight Adverse landscape effect.

Visual effects –

The visual effects of proposed development are the changes that arise in the composition of available views as a result of changes to the landscape and the degree to which these changes affect the overall amenity and character of an area.

The LVIA identifies a number of key local viewpoints, and then assesses the effects of the proposed development on the views. The viewpoints are identified on the following plan forming part of the LVIA. Following this, a table - also taken from the LVIA - sets out the range of effects.



LVIA photograph (viewpoints) locations

Reference, Receptor and Location		Range of Effects		
		Sensitivity	Magnitude	Significance
Views from the north-west				
A	Corner of Brokerswood Lane	Medium	Small	Slight Adverse
B	Biss Brook valley public footpath	Low to Medium	Small to Medium	Moderate to Slight Adverse
C	Stephenson Road looking south-east	Low	Small	Slight Adverse to Negligible
PM2	Public footpath on eastern edge of Round Wood	Medium to High	Medium	Moderate Adverse
Views from the south				
D	Town centre car park	Low	Medium	Slight Adverse
E	Public footpath on rounded hilltop south-east of town centre	Medium to High	Small	Slight Adverse
F	Leighton Close, Westbury Leigh	Medium	Small	Slight Adverse
G	Biss Close, Upton Scudamore	Medium to High	Small	Moderate to Slight Adverse
H	Public footpath south-east of Dilton Marsh church	Medium	Small	Slight Adverse
I	Penleigh Road	Medium	Small	Slight Adverse
Views from the west				
J	St Mary's Lane, Dilton Marsh	High	Small	Moderate Adverse
K	Scotland Lane	High	Small	Moderate to Slight Adverse
PM1	Public footpath north-west of Brook Farm	Medium	Large	Substantial to Moderate Adverse
PM3	Public footpath east of Scotland Lane	Medium to High	Medium	Moderate Adverse
Views from the east				
PM4	Top of scarp slope by Westbury White Horse	High	Small	Moderate to Slight Adverse

LVIA: Viewpoints analysis

The LVIA notes that the development would be visible from a range of viewpoints situated on higher ground to the west and south of the site. If further notes that the visual impact is significantly less than might otherwise be due to "… *its location immediately adjacent to Westbury Dairies [Arla], which due to its colour and size is an extremely prominent local landmark …" which "…. serves to anchor the proposed buildings in the landscape and indeed from some vantage points to the north largely screening them from view*".

The LVIA acknowledges that the most prominent structure in most views would be the 75m stack, although it concludes that its visibility would diminish when seen against the sky at a distance.

In the main, the significance of the effects on all identified views would be only 'Slight Adverse' to 'Moderate Adverse' having regard to the mass of existing buildings in these views (notably the dairy), and the distance and/or fragmented nature of the views in what is a vast landscape and/or townscape anyway. The exception is the view from the public footpath running north-west of Brook Farm, where the effect – due in part to proximity – would be 'Substantial – Moderate Adverse', but, again, read in the context of the other buildings and the further employment land allocation. This adverse effect in isolation is not considered sufficient to sustain an objection to the proposal's overall lesser impact in all other views.

The distant view from the east – from the popular 'beauty spot' by the Westbury White Horse – is concluded to be 'Moderate to Slight Adverse'. The ES states,

> "Although the proposed buildings and associated stack will be clearly visible from the top of the scarp slope adjacent to *The White Horse* (in suitable weather conditions) they occupy an extremely small proportion of the overall panoramic views available. The small part of the view affected is already influence by existing industrial development at the dairy, MBT and adjacent industrial sites. Visitors to this location would be exposed to the whole panorama (which includes the former Lafarge cement works buildings) thus reducing the prominence of the Northacre Renewable Energy site still further. There is considered to be a minor deterioration in the quality of that part of the view that looks towards Westbury, largely because of the contrast in colour between the stack and the woodland beyond and the intensification of industrial development in proximity to the dairy. While this viewpoint is located approximately 4km to the east of the Northacre Renewable Energy site the town of Westbury does act as a focal point within the wider view and does tend to draw the eye in that particular direction, although there are likely to be some visitors who will focus more on the surrounding countryside and White horse. Taking all the above factors into consideration the overall magnitude of change is deemed to be Small and the resulting level of visual effect is classified as Moderate to Slight Adverse".

These conclusions on the significance of impacts on views are agreed. The landscape in this area (and related views) has been, and will continue to be, influenced by the industrial operations at the industrial estates, and the proposal would not significantly add to or change this. Although parts of the development would be sizeable (notably the main building and stacks), these would be seen in the context of other existing substantial buildings and the wider urban form of Westbury, and the stacks in isolation are relatively slender structures within the wider views. With the use of appropriate materials for the buildings and additional landscaping - as proposed in this revised application – an acceptable situation would be achieved; likewise, the use of modern lighting techniques would lessen the impacts of the intended 24 hour operation. Overall, it is accepted that the effects on visual amenity would be acceptable.

Landscape and visual impact, and the 'planning balance' -

Overall, it is considered that as a consequence of the application site being allocated employment land *and* lying within an 'ordinary landscape' of medium sensitivity characterised by elements of built industrial form, *and* in view of at least some localised screening provided by woodland belts and hedgerows giving fragmented views from the west, that the proposed development can be accommodated without significant landscape or visual harm. In a number of views (notably from higher ground, including the escarpment to the east) the site is visible, but as these views are panoramic and, in some cases, at a distance, and as the industrialised form of the site is now part of the landscape in any event, it is not considered that detriment would be caused to the landscape and the views as a consequence of what is proposed. The recognised 'adverse' impacts on the landscape character of the adjoining landscape character area and on views from the close-by footpath would not in isolation amount to a sustainable reason for refusing planning permission, particularly when the fall-back position of an extant planning permission and other benefits arising from the development in general (notably, the wider benefits for waste management and sustainability) are applied to the 'planning balance'.

The other benefits have been set out by the applicant as:

- Improved financial and environmental savings for businesses in Wiltshire producing non-recyclable waste. Businesses operating in Wiltshire producing non-recyclable waste would have the opportunity for their material to be dealt with locally instead of exported at great expense to other areas of the UK or overseas. This would save those businesses money, and the associated environmental benefits of less road miles and a non-landfill solution.
- Both the money generated from the 'gate fee' and the power generated would be used in the UK from UK produced waste rather than mainland Europe benefitting. This would positively impact on the regional and UK economy. Currently 3.5m tonnes of material is exported from the UK to Europe for use by European energy plants creating heat and power. The UK is paying a premium for this, with the economies of the other countries benefitting.
- Offer a 'better than market gate fee' for Wiltshire Council's material from the adjacent MBT Plant. This is because the revised scheme is deliverable in terms of capital investment and operational costs of running the plant, as a result Northacre Renewable Energy would be able to pass this benefit through to the municipal contract. The estimated savings against waste export/landfill or utilising other UK energy from waste schemes are substantial over the life of the treatment contract.
- During construction the impact on the local economy would be significant for a typical project of this scale.

Other mitigation –

In addition to the proposed changes to the layout, massing, height and external materials for the main building, it is also proposed to form a landscaped bund on part of the land to the west of the application site by utilising soil and subsoil material extracted through the planned lowering and levelling of the application site. The bund is the subject of a standalone planning application (18/09550/FUL) – next on the agenda.

It has been demonstrated in the preceding paragraphs that the proposed ATT facility is acceptable in any event in terms of its impacts on landscape character and views, regardless of this separately proposed bund. But this said, the bund and its related landscaping, if approved, would further soften the 'rear' elevation, and so enhance views towards the site from the west. It would also avoid the need for extracted material to be removed from the site by road and disposed of further afield.

The actual merits and impacts of the bund in isolation are assessed separately under its planning application – next on the agenda.

9.3 Traffic & Highway Safety

Policy background –

Policy WCS2 ('Future Waste Site Locations') of the Wiltshire & Swindon Waste Core Strategy 2009 states that in the interests of achieving the objectives of sustainable development, priority will be given to proposals for new waste management development that demonstrate a commitment to utilising the most appropriate haulage routes within and around the Plan area and implement sustainable modes and methods for transporting waste materials.

Policy WDC1 ('Key criteria for ensuring sustainable waste management development') of the Wiltshire & Swindon Waste Development Control Policies DPD 2009 sets out key criteria for assessing planning applications for waste development, this including the need for the impact of transporting waste to and from sites to be minimised. Policy WDC2 ('Managing the impact of waste management') has a similar requirement. More specifically Policy WDC11 states the following:

Waste management development will be permitted where it is demonstrated that the proposals facilitate sustainable transport by (where they are relevant to the development):

- *Minimising transportation distances*
- *Maximising the use of rail or water to transport waste where practicable*
- *Minimising the production of carbon emissions*
- *Ensuring a proposal has direct access or suitable links with the Wiltshire HGV Route*
- *Network or Primary Route Network*
- *Establishing waste site transport plans*
- *Mitigating or compensating for any adverse impact on the safety, capacity and use of a highway network. …..*

The Wiltshire Core Strategy contains similar general transport policies.

Transport Assessment –

A Transport Assessment (TA) to assess the likely impact of the proposed development on the local highway network has been provided. This is, in essence, the TA prepared in 2014 for the original ATT application. The reason for relying on the earlier TA is in view of the impacts of the current proposal on the wider highway network (in terms of the quantities of material to be imported and exported from the site) remaining broadly unchanged from those predicted for the original application. A covering note accompanying the TA (dated 2 October 2018) confirms this in the following terms:

"The proposed internal modifications to the scheme will not alter the predicted traffic attractions, which remain at just 4 HGV movements and 7 staff commuting movements in the weekday peak hours, with 131 HGVs predicted over an 85 hour working week (07:00 – 22:00 Monday to Friday and 07:00 – 17:00 Saturday).

There would be no change in the Predicted Traffic Distribution …. which set out additional HGV movements at +41.5 per day, routed to the Yarnbrook roundabout via the West Wilts Trading Estate and B3097. From Yarnbrook, 31 additional HGV movements per day would use the A350 to the north and an additional 10.5 per day would pass through Westbury on the A350 to the south".

It is of note that presently 41,500 tonnes of SRF exported from Northacre RRC (to Europe) would be diverted to the proposed ATT, so removing this from the road network. It is also of note that use of the site for general employment uses (as is effectively allowed by the employment land allocation in the Wiltshire Core Strategy) would potentially generate significantly higher levels of traffic – c.77-87 vehicle movements in an hour in general employment use (c.800 vehicle movements/day), (based on standardised TRICS[9] data).

In terms of the actual impact of these additional HGV movements on the wider network the TA note concludes the following:

> "With regard to the Yarnbrook Roundabout, … the development was [therefore] expected to add just 10 vehicle movements over an hour to the weekday peaks, which when considered against the 2019 baseline flows[10] amounted to changes of just 0.35% which would be imperceptible. ….
>
> …. only occasional, non-operational deliveries (office/cleaning supplies) would be routed via the A36.
>
> The additional traffic on the A350 …. which amounted to just 4 peak hour HGV movements, 3 heading north and one south through Westbury, would have no impact".

Regarding HGV construction traffic, there is a change in circumstances since the last application in that it is now proposed to level and lower the site, this resulting in some 45,000 cu m of surplus soil and sub-soil. It is proposed to use this on adjoining land to form a bund; however, as this bund is the subject of a standalone planning application, the TA covering note has considered the implications of moving the material off-side. The TA covering note states the following:

> "…. the material would be exported in 15 cu m loads over a 26-week period, operating 5.5 days per week. That equates to 21 lorry loads per day, or 42 daily HGV movements which would be routed to the north via the WWTE (Link Road), B3090 and A350 for processing at another site operated by Hills. Over a 10-hour working day, an average of 4 HGV movements an hour might therefore be expected on the route to/from the A350.
>
> Traffic survey data recorded in October 2016 for planning application no. 17/12342/OUT shows weekday AM/PM peak hour movements through the first three roundabouts on the B3097 / A350 route as follows:

	Weekday AM Peak Hour		Weekday PM Peak Hour	
	All Vehicles	HGVs	All Vehicles	HGVs
Link Road/ B3097 Roundabout	1,061	91	1,285	62
B3097/ A363 Roundabout	2,103	93	2,119	81
A363/ A350/ B3097 Roundabout	2,464	117	2,640	95

> In the context of the above existing traffic flows, which do not take account of extensive committed development, it is clear that an additional 4 HGVs an hour during the short-term

[9] TRICS (Trip Rate Information Computer System) is a database of trip rates for development types used for transport planning purposes, specifically to quantify the trip generation of new developments.

[10] The 2019 baseline traffic flows at the Yarnbrook roundabout were assessed to be 2,769 PCUs (passenger car units, where 1 HGV = 2 PCUs) in the AM peak hour, and 2,898 in the PM peak. The peak hour increases in traffic would therefore amount to about 0.35% in either peak hour, which would be imperceptible relative to day to day variations in traffic flows. It is also relevant to this that the Yarnbrook roundabout / A350 hereabouts will be the subject of improvements as a consequence of the planned Ashton Park development which will change their operation.

groundworks period would have no material impact on the operation of the highway network"

Following groundworks, HGV construction traffic is predicted to reduce to 2-5 per day. This level is also considered to be low impact in this context.

The conclusion of the TA and TA covering note are agreed by the Council's highways team. It is relevant that the proposal would generate the same / comparable levels of traffic to that considered acceptable when the original ATT application was considered and approved. It is also relevant that use of the site for other employment uses, as the Core Strategy 'employment' designation allows, could give rise to significantly higher HGV and car movements than those predicted for the ATT use now.

The Environmental Statement relies on the TA outcomes, and so draws the same conclusions with regard to environmental impacts associated with traffic.

Notwithstanding these conclusions on the limited impact of traffic, the TA proposes 'mitigation' in any event, this to "… *complement the sustainable nature of the development*". The mitigation comprises a Travel Plan – to reduce the number of car borne trips (by staff in particular). A standard condition requiring a Travel Plan is recommended accordingly.

In addition a condition requiring a Construction Environmental Management Plan (CEMP) for the period of construction is also recommended.

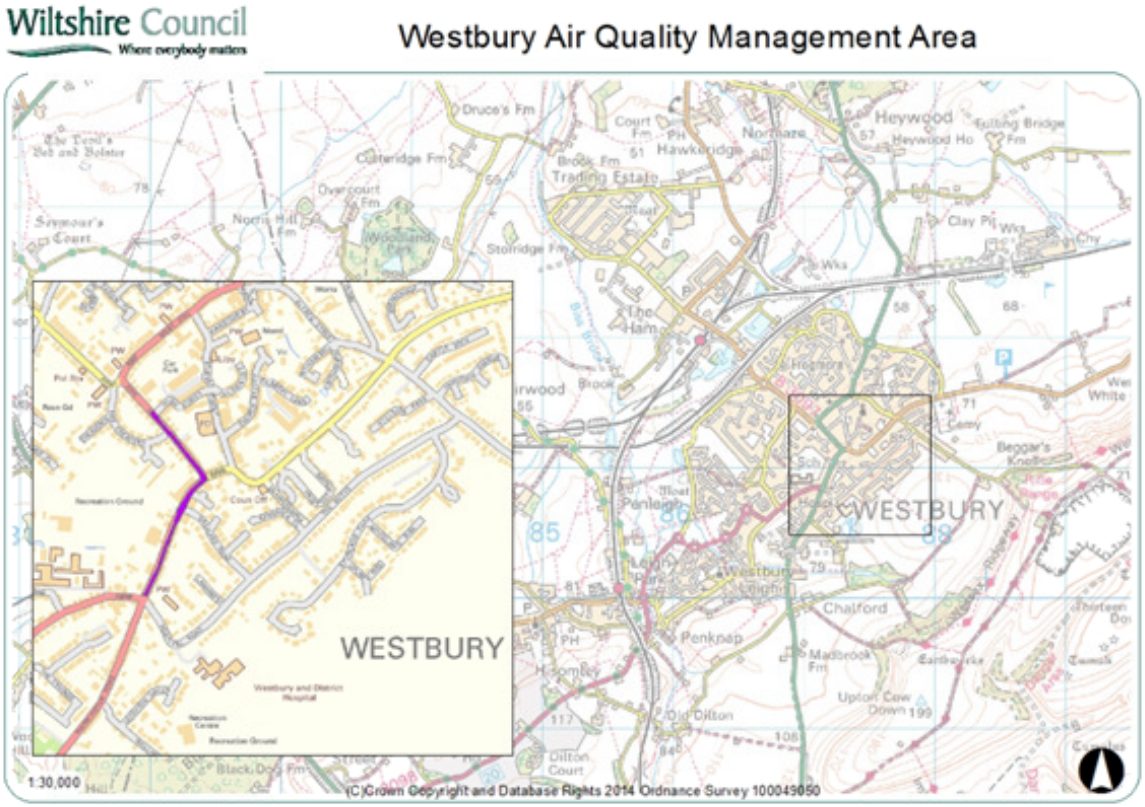
9.4 Westbury Air Quality Management Area

Core Policy 55 relating to air quality requires development proposals, which by virtue of their scale, nature or location are likely to exacerbate existing areas of poor air quality, to demonstrate that measures can be taken to effectively mitigate emission levels in order to protect public health, environmental quality and amenity. Mitigation measures may include possible traffic management or highway improvements, abatement technology, traffic routing and site management, and where appropriate contributions.

The Air Quality Strategy for Wiltshire 2011-2015 states the following:

Air quality in Wiltshire is predominantly good with the majority of the County having clean unpolluted air. There are however a small number of locations where the combination of traffic, road layout and geography has resulted in exceedences of the annual average for nitrogen dioxide (NO2) and fine particulates (PM10).

These locations include parts of the A350 where it passes through Westbury, as indicated on the following plan:



An Air Quality Action Plan for Wiltshire is awaiting DEFRA approval, and a specific Westbury Action Plan is in preparation. An Air Quality SPD is also in preparation. The draft version of the SPD states the following:

Where developments take place in an AQMA [Air Quality Management Area], mitigation measures must be considered as standard practice, particularly in cases where the development is new and does not replace an existing use. This is especially important where the development has provision for a large number of parking spaces, significantly increasing the number of trips, and/or heating plant. In some cases it may be necessary to recommend refusal where a development is so contrary to the objectives of the Air Quality Action Plan and Strategy.

The SPD states that mitigation may take the form of appropriate construction, appropriate design, travel plans, use of clean/alternatively fuelled vehicles, and low emission schemes and strategies.

Notwithstanding the conclusions already set out relating to predicted reductions in overall traffic compared with the development already permitted at the site, the proposal would generate traffic, including additional HGV traffic, and inevitably some of this traffic would pass through the Westbury AQMA, as the TA predicts. On the quantity the TA states the following:

> "The Air Quality Management Area in Westbury would experience a traffic increase averaging 10.5 HGVs per day, or just one additional HGV movement every 1.4 hours. There would be no perceptible impact on the AQMA".

The conclusion that the development is unlikely to result in a significant impact on current air quality is accepted. However, in the context of LAQM and EPUK guidance – which states

that *"Even where the effect is judged to be insignificant, consideration should be given to the application of good design and good practice measures"* – and in the light of Core Policy 55 which requires effective mitigation in order to protect "public health, environmental quality and amenity", it is considered that mitigation would be required in any event. The TA offers the Travel Plan as referred to previously. In addition, the Council's Public Protection Team in seeking to reduce emissions in the interests of good design and good practice, recommends the provision of some Ultra Low Energy Vehicle (ULEV) infrastructure in the development; a further condition is recommended accordingly.

9.5 Residential Amenity (including effects of noise/vibration, air quality, odours, flies, etc.)

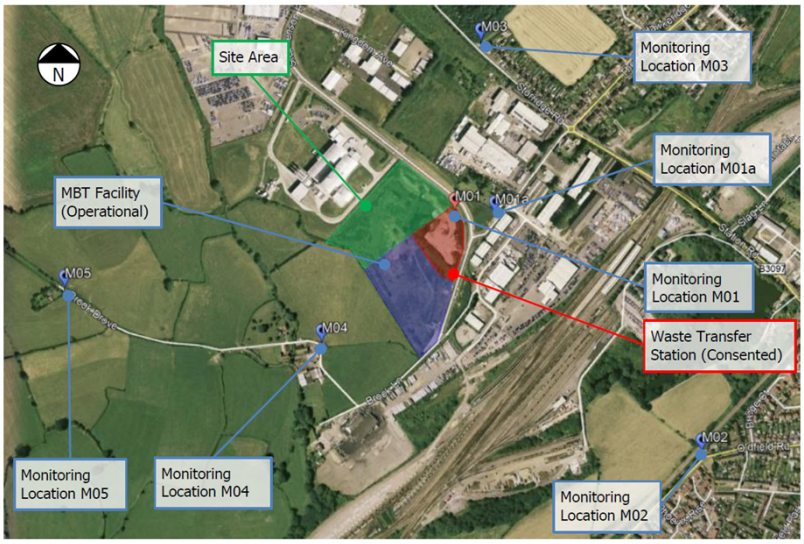
Policy background –

Policy WDC2 ('Managing the Impact of Waste Management') of the Wiltshire & Swindon Waste Development Control Policies DPD states that proposals for waste management development in Wiltshire and Swindon will be permitted where it can be demonstrated that the proposal avoids, adequately mitigates against, or compensates for significant adverse impacts relating to, notably here, amenity and noise emissions. Core Policy 57 (Ensuring high quality design and place shaping) of the Wiltshire Core Strategy sets out similar criteria to safeguard residential amenity.

Noise and vibration –

The application is accompanied by a 'Noise Assessment for a Planning Application' report (28 September 2018). This compares the potential noise impact of the proposed revised facility (using noise data and/or noise assumptions for the planned buildings and plant) with background noise levels *and* with the noise impacts predicted, and accepted, in the assessment report accompanying the original ATT planning application (the Enzygo report).

The background noise survey data is that recorded following surveys carried out across the area in February/March 2018. Similar assessment locations are then used to model the impacts of the revised proposal. The locations for the modelling are indicated on the following aerial photograph taken from the assessment (where 'Assessment Location M01a' is the nearest residential property):



Noise Assessment Locations

A number of planned noise mitigation measures have also been assumed within the modelling process, summarised in the assessment as follows:

- "The layout of the site has been arranged so as to make use of the screening influence of buildings and structures to limit the propagation of noise toward receptor locations;
- Where possible, noise generating plant has been installed within buildings or suitable enclosures to reduce noise emissions to the environment;
- Additional screening has been provided by means of a specific acoustic barrier in the south eastern corner of the site. The barrier would be 3.5m as a minimum and be located in a similar location to that permitted as part of the original planning consent;
- The cladding for the Boiler House, Gasifier and Turbine Hall are to afford Rw 40dB as a minimum;
- The access door to the Boiler House is required to achieve 27 dB Rw;
- The stack is assumed to include a silencer which will, as a minimum, will reduce the overall sound power level of the stack to 83dB LWA at the point of emission;
- The Flue Gas Treatment process is to be suitably addressed to reduce noise emissions to 79dB LWA;
- The ID fans would be attenuated to achieve a sound power level of 77dB LWA;
- A speed limit for vehicles within the site area would be 16kph and would be adhered to by all vehicles (delivery vehicles and visitor cars)".

Based on the above circumstances and modelling, the noise assessment report concludes that the noise impact from the revised design in this planning application during its operation would be "negligible / neutral" during both daytime and overnight periods, and so would not result in any significant noise impacts. This is, in fact, a slight improvement over the consented ATT which would generate a "negligible / neutral to minor" effect at receptor M01a (albeit that even this would be below the level at which BS4142:2014[11] would consider it to be an adverse impact).

On construction noise, the noise assessment report proposes construction noise thresholds based on the survey work and in accordance with BS5228[12]. These measures would be included in the CEMP (Construction and Environmental Management Plan), which is a matter for planning conditions.

The noise assessment report confirms this in the following terms:

> "The Enzygo report [*that is, the noise assessment report with 14/12003/WCM*] concluded that the noise impact during the operational phase would be negligible / neutral to minor during both the daytime and overnight periods.
>
> The assessments undertaken in this report, based on the revised layout would be negligible / neutral based on the same impact significance criteria. Given this, it is considered that the proposed facility would not result in any significant noise effects or a change from the consented scenario. …..
>
> Overall, the assessments …… indicate that the noise impacts associated with the revised Northacre Renewable Energy Facility would be no worse than those consented under the previous application. Indeed, the comparison presented below indicates that the revised layout would offer a number of advantages over the previous iteration of the site layout. Table 16 below summarises a comparison of the noise impact significance between the two iterations of the site layout.

[11] BS4142:2014 – British Standard 'Methods for rating & assessing industrial & commercial sound'.

[12] BS5228 – British Standard 'Code of practice for noise & vibration control on construction & open sites. Noise'.

Table 16: Comparison of Noise Impact Significance

Assessment Element	Impact Assessment of Consented Development (2015)	Impact Assessment of Revised Development (2018)
Construction Noise	N/A	N/A
Construction Vibration	N/A	N/A
Operational Noise – Daytime	Negligible / Neutral to Minor	Negligible / Neutral
Operational Noise – Night-time	Negligible / Neutral to Minor	Negligible / Neutral
Off Site Road Traffic Noise	Negligible / Neutral	Negligible / Neutral
Cumulative Impact	N/A	Negligible / Neutral

Overall, the variation to the proposed Northacre site would result in no significant noise impacts which would preclude a revised layout and design being granted".

These conclusions are agreed by Public Protection Team. However, a condition is recommended to ensure that the development is completed in accordance with the noise levels and mitigation measures set out in the Noise Assessment for a Planning Application, and subsequently tested.

As stated above, construction noise would be controlled via the CEMP, which is also a matter for conditions.

When operational the proposed development by reason of its manner of operation should not give rise to vibration. Vibration during construction (from, for example, piling) would be managed via the CEMP.

The Environmental Statement relies on the Noise Assessment's outcomes, and so draws the same conclusions with regard to environmental impacts associated with noise and vibration.

Air quality: emissions –

The principal types of emissions to air that may result from operation of the proposed development are:

- Emissions associated with vehicle movements.
- Process emissions vented through the proposed facility's stacks.

Emissions from vehicle movements have been addressed above in association with the Traffic and Highway Safety section of this report. In view of the relatively limited number of additional movements in the locality (and through the AQMA) generated by the proposal the effect of emissions to atmosphere from vehicles is considered to be negligible.

Process emissions – during operation, emissions to atmosphere will occur from the following sources:

- Twin flue 75 m high stack
- 40 m high ventilation stack

The Environmental Statement contains a chapter which covers air quality. On process emissions, the chapter states that in order to quantify the potential impact of emissions from the process, and to determine the optimum stack height for dispersion (which is proposed to be 75m for the main stack and 40m for the ventilation stack), detailed atmospheric dispersion modelling has been undertaken.

The ES states that the principal pollutants that would be released to atmosphere from the development are -

- Oxides of nitrogen (NOx)
- Fine particulate matter (PM_{10} and $PM_{2.5}$)
- Sulphur dioxide (SO2)
- Carbon monoxide (CO)
- Hydrogen chloride (HCl)
- Hydrogen fluoride (HF)
- Ammonia (NH3)
- Benzene (C6H6)
- Dioxins and furans
- Twelve metals
- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)

The relevant full chapter from the ES which explains the assessment methodology is included at annex 3 to this report. The critical table from this chapter ('Table 13') - which sets out the maximum predicted incremental concentrations due to emissions to atmosphere - is also set out below, followed by the ES's related conclusions:

Pollutant	Averaging period	Predicted concentration ($\mu g\ m^{-3}$)	Assessment criteria ($\mu g\ m^{-3}$)	Percentage of assessment criteria (%)
Nitrogen dioxide (NO_2)	1 hour	8.0	200	4.0%
	Annual	1.03	40	2.6%
Particulate matter (PM_{10})	24 hour	0.25	50	0.5%
	Annual	0.07	40	0.2%
($PM_{2.5}$)	Annual	0.07	20	0.4%
Sulphur dioxide (SO_2)	15 minutes	6.5	266	2.4%
	1 hour	5.5	350	1.6%
	24 hour	2.7	125	2.2%
Carbon monoxide	8 Hour	5.3	10,000	0.1%
Hydrogen chloride	1 Hour	3.0	750	0.4%
Hydrogen fluoride (HF)	Annual	0.007	16	0.0%
	1 Hour	0.30	160	0.2%
Benzene (C_6H_6)	Annual	0.007	5.0	0.1%
	1 Hour	0.30	195	0.2%
Ammonia (NH_3)	Annual	0.073	180	0.0%
	1 Hour	2.95	2,500	0.1%
Antimony (Sb) (a)	Annual	0.0004	5	0.0%
	1 Hour	0.017	150	0.0%
Arsenic (As)	Annual	0.000005	0.003	0.2%
Cadmium (Cd)	Annual	0.00018	0.005	3.7%
Chromium (Cr) (b)	Annual	0.0004	5	0.0%
	1 Hour	0.017	150	0.0%
Chromium (Cr,	Annual	0.0000003	0.0002	0.1%
Cobalt (Co)	Annual	0.0004	0.2	0.2%
Copper (Cu)	Annual	0.0004	10	0.0%
	1 Hour	0.017	200	0.0%
Lead (Pb)	Annual	0.0004	0.25	0.2%
Manganese (Mn)	Annual	0.0004	150	0.0%
	1 Hour	0.017	1,500	0.0%
Mercury (Hg)	Annual	0.0004	0.25	0.1%
	1 Hour	0.015	7.5	0.2%
Nickel (Ni)	Annual	0.0004	0.02	2.1%
Vanadium (Vn)	Annual	0.0004	5	0.0%
	1 Hour	0.017	1	1.7%
Dioxins	Annual	0.73 (a)	-	-
PAHs	Annual	0.73 (a)	0.00025	0.0%
PCB	Annual	0.02 (a)	0.2	0.0%
	1 Hour	0.77 (a)	6	0.0%

(a) – units are fg m^{-3} ($x10^{-15}$)

ES 'Table 13' - Maximum predicted incremental concentrations due to emissions to atmosphere from the proposed facility[13]

[13] Table 13 explanation: The concentration of, for example, NO2 is measured in micrograms in each cubic metre of air (µg m-3). A microgram (µg) is one millionth of a gram. A concentration of 1 µg m-3 means that one cubic metre of air contains one microgram of pollutant. To protect health, the UK Government sets two air quality objectives for NO2 in their Air Quality Strategy:

- The hourly objective, which is the concentration of NO2 in the air, averaged over a period of one hour. This is designed to make sure that we are not exposed to high concentrations of NO2 for short periods of time. High concentrations can arise in episodes, which are usually associated with particular weather conditions.
- The annual objective, which is the concentration of NO2 in the air, averaged over a period of a year. This aims to protect us from being exposed to NO2 over a long time. The European Union (EU) has also developed legislation to limit our exposure to air pollutants, through what are known as limit values. The limit values for each pollutant are set out in the 'Assessment Criteria' column of Table 13.

The ES conclusions state the following:

> "Table 13 shows that, as a percentage of the short term assessment criteria, it is the 99.8th percentile of hourly average concentration of nitrogen dioxide (NO_2) which is 4.0% of the assessment criteria that has the largest impact. When combined with the background concentration, the PEC (Predicted Environmental Concentration) of 27.8 µg m^{-3} is 13.9% of the assessment criteria and not considered to be of concern to human health.
>
> For annual average impacts the increment to annual average concentration of cadmium (Cd) is predicted to give rise to the largest percentage of the assessment criteria of 3.7%. It should be noted that the assessment criteria of 0.005 µg m^{-3} is from the World Health Organisation Air Quality guidelines (2000) which state that the guideline is set to 'prevent any further increase of cadmium in agricultural soils'. Given that the maximum predicted concentration is substantially less than the assessment criteria and that the location of maximum impact is predominantly urban, it is considered that there is no concern to human health.
>
> Dioxins and furans are a group of organic compounds that are formed as a result of incomplete combustion in the presence of chlorine. Sources include vehicles, domestic and industrial coal burning, power generation and incinerators. There are no regulatory air quality standards set for dioxins and furans; this group of substances, however, are important in terms of risk to human health and the effects of dioxins are assessed through a human health risk assessment (HRA). The maximum predicted ground level concentration of dioxin of 0.73 fg I-TEQ m^{-3} is small compared with the prevailing dioxin concentration and not of concern to human health as demonstrated by the health risk assessment that has been undertaken for the proposed development …..".

The ES concludes that dispersion provided by a 75m main stack and 40m ventilation stack is sufficient to render the emissions harmless at ground level to both human health and ecological receptors. Further assessment of these matters would be undertaken as part of the separate Environmental Permitting process in any event (see separate sub-section about Environmental Permitting below). In view of this, public concern over impacts on health should not be considered a reason to delay determination of the planning application and/or to refuse permission.

<u>Plume visibility, plume grounding, operational odours, bio-aerosols</u> –

The ES also assesses these matters. On plume visibility the ES states the following:

> "Once released to atmosphere, emissions will dilute, cool, and depending on the prevailing ambient temperature and relative humidity, may condense to form a visible vapour plume. The frequency and extent of any visible plume depends on the ambient temperature and relative humidity and the rate of plume dilution. …..
>
> ……. for the year that gives rise to the highest frequency occurrence of visible vapour plumes (2013) the predicted occurrence is 6.3% of the time. It should be noted that these percentages are for all hours including night time hours where a higher frequency will occur due to lower ambient temperatures".

On plume grounding the ES states the following:

> "Plume grounding is usually the description given when a plume can be observed to impact on the ground or elevated terrain. Plumes are usually only visible if they contain smoke,

which is not the case here, or if water vapour in the plume has condensed to form a visible vapour plume.

Whether visible or not, all plumes will ground; the dispersion model used for this assessment calculates the frequency and intensity of plume grounding events to predict the resulting ground level concentrations.

The assessment of the frequency of visibility vapour plumes …. shows that visible vapour plumes longer than 100m will only occur for 0.5% of the year and therefore the frequency of visible plume grounding events will be significantly less than 0.5% for locations more than 100m from the proposed facility. It should be noted that for the majority of the time when a plume is visible (e.g. 0.5% for plumes more than 100m) the visible part of the plume will not be coming to ground and therefore there will not be a visible plume grounding event".

Effects of revised design: building downwash –

The presence of buildings can significantly affect the dispersion of emissions as wind blowing around a building distorts the flow and creates zones of turbulence that are greater than if the building was absent. The reduction in the proposed maximum building height from 37.8m to 36.8m means that there is a potential for the assessment findings to change. Accordingly the Air Quality Assessment which informs the Environmental Statement includes an Addendum (19 September 2018) which considers this. Its conclusion states the following:

"The only changes to the previously submitted design that are relevant to the air quality assessment are modifications to the layout of the buildings and their heights. Previously, the maximum building height was 37.8m which has been reduced to 36.8m which will give rise to less building downwash, improved dispersion and a lowering of the resulting ground level pollution concentrations. …..

The predictions presented in [the] Addendum show that the changes to building heights and layout make no discernible difference to the predicted short-term impacts and marginally reduce the long term impacts. The predicted reduction in long-term (annual average) concentration is not sufficient to justify the re-modelling and assessment of the facility. The conclusions detailed in the submitted assessment (February 2018) are still valid and in the light of the change in building dimensions should be viewed as conservative".

On operational odours the ES states the following:

"…… the predicted odour impacts are significantly below the level that would give rise to annoyance of 3.0 OUe m-3 and therefore can be screened out as having an impact of negligible significance.

There are four locations where the IAQM magnitude of change descriptor is slight. The IAQM guidance on odours states: Where the overall effect is greater than 'slight adverse', the effect is likely to be considered significant. This is a binary judgement: either it is 'significant' or 'not significant'. Therefore, in this case, the overall impact is 'not significant'.

Predictions of odour impact have also been made at the location of the air intake to the dairy because of the potential for odour to taint dairy products. The maximum predicted 98th percentile odour concentration at the dairy air intake is 0.10 OUe m-3. Even though this is only 3% of the threshold for annoyance there is still the possibility of detectable odours from time to time, but not at an intensity or duration likely to cause annoyance.

Widely accepted odour thresholds are as follows:

- 1 OUe m-3 - point of detection in a laboratory
- 3 OUe m-3 - recognition threshold
- 5 OUe m-3 - a faint odour
- 10 OUe m-3 - a distinct odour

For 2013 meteorological data, which is the year of maximum impact at the location of the dairy, the maximum one hour average odour concentrations at the location of the dairy air intake is 2.3 OUe m-3 which is less than the recognition odour threshold and so odours at the location of the air intake will be undetectable over an averaging period of one hour. It should also be noted that the prevailing background odour is likely to be in the range of 5 to 40 OUe m-3 i.e. considerably higher than the incremental increase predicted to occur due to emissions from the proposed facility".

On bio-aerosols, following assessment the ES concludes that the maximum predicted annual average concentration of bio-aerosols at the location of the dairy air intake is negligible.

Air quality / emissions conclusions –

National Planning Policy for Waste advises that when determining waste planning applications, waste planning authorities should: ...*consider the likely impact on the local environment and on amenity against the criteria set out in Appendix B and the locational implications of any advice on health from the relevant health bodies. Waste planning authorities should avoid carrying out their own detailed assessment of epidemiological and other health studies*.

With regard to '*air emissions, including dust*', Appendix B advises that considerations will include the proximity of sensitive receptors, including ecological as well as human receptors, and the extent to which adverse emissions can be controlled through the use of appropriate and well-maintained and managed equipment and vehicles.

The submitted ES sets out the results of the dispersion modelling and assessment which demonstrate that, with a stack height of 75 m, the maximum predicted concentrations of all substances emitted comply with relevant air quality objectives at nearby sensitive locations, including residential areas and nature conservation sites, and the air intake of the adjacent Westbury Dairies.

The ES sets out the results of assessments, including a human health assessment, which demonstrate no unacceptable impacts to address public concern. The overall effect on air quality of emissions to atmosphere is concluded in the Environmental Statement to be of minor significance. Construction emissions can be controlled via a CEMP. Process emissions are principally a matter for Environmental Permitting.

Environmental Permitting –

National Planning Policy for Waste advises that when determining waste planning applications, waste planning authorities should: ...*concern themselves with implementing the planning strategy in the Local Plan and not with the control of processes which are a matter for the pollution control authorities. Waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced*.

As noted by the Council's Public Protection officer, the application relates to a process that will require an Environment Agency 'Permit' to operate, under the provisions of the Environmental Permitting Regulations 2016 (EPR). These regulations include the requirements of relevant EU Directives, notably, the Industrial Emissions Directive (IED), the waste framework directive (WFD), and ambient air directive (AAD). EPR requires the operator to use the 'best available technology' to ensure that impacts from the site are acceptable, minimised and are compliant with UK and EU air quality and emissions standards.

The EA also consults Public Health England (PHE). The Council's Public Protection officer has liaised with Public Health England (PHE) regarding the planning application and the in-common response is that that the proposed ATT plant would be subject to a permit issued by the Environment Agency, and this would govern emissions and impacts from the gasification process and ancillary waste handling activities. The Council's Public Protection officer is satisfied along with PHE that the applicant has demonstrated that the proposed development can be carried out without any significant impact on health, subject to compliance with UK air quality and emission standards. PHE's response is attached as Annex 2 to this report.

PHE is satisfied that the applicant has approached the environmental impact assessment in a manner consistent with the UK requirements. The applicant has utilised a satisfactory approach and methodology to predict the likely emissions, the range of key pollutants and the impact on the local environment and receptors.

As part of the environmental permitting process, the EA assess all applications to ensure that they meet the requirements of the Environmental Permitting Regulations. During assessment, the design of the plant is reviewed, as well as how it will be operated, the emissions it will generate (to air, water and land) and whether emissions will have an adverse impact on people living nearby and the natural environment.

The Environment Agency assesses impacts of facilities like this on the environment and human health. They use a number of methods, but one of the key assessments for PM_{10}, $PM_{2.5}$ and NO_x is to compare the modelled emissions from the plant with the European air quality standards for these emissions (also taking into $PM_{2.5}$ account the existing levels of pollution around the plant). The EA assumes that the plant operates at its permitted limits 100% of the time (when in reality it won't). For PM_{10} and they also assume that Total Particulate Matter (TPM) = PM_{10} = $PM_{2.5}$; making these assumptions means that the EA assesses the worst-case scenario, which then forms the basis of the 'Permitting' decision.

Concern has been raised by some interested parties about the monitoring of the emissions from the facility. Monitoring is part of the 'Permitting' process; however, as noted in a recent EA briefing note (annex 5 to this report) on particulate matter associated with similar facilities, plants are required to continuously measure total particulate matter (TPM). TPM includes particulates of all sizes including PM_{10}, $PM_{2.5}$, PM_1 etc. as well as ultrafine particles (i.e. particles with a diameter of less than 0.1 micrometres). When this is considered alongside the assumption made by the EA at the 'Permitting' stage that all TPM could be PM_{10}, or all be $PM_{2.5}$ or PM_1 (and so on), the concern is robustly addressed.

In order to achieve the limits set by the Industrial Emissions Directive (IED), the operator would need to show that they will use Best Available Techniques (BAT). The European Commission produces best available technique reference documents or BREF notes. They contain 'best available techniques' (BAT) for installations such as this. They are subject to review and updating.

Once issued energy from waste permits can set controls on a range of factors. These include detailed requirements through the commissioning phase of the plant, including reports on the performance of the facility against the conditions of the Permit. Additionally, Permits condition and control:

- Waste inputs – type, quantities, annual throughput;
- Process controls – how activities on-site will be managed;
- Emissions limits – air, land and water;
- Performance monitoring – ongoing measurement of activity, by submission of extensive records regarding all aspects of the process.

As is evident, Environmental Permitting provides a robust system for application, approval, monitoring and enforcement of matters relating to waste and related emissions. It is at least in part for this reason that National Planning Policy for Waste can advise that *Waste planning authorities should avoid carrying out their own detailed assessment of epidemiological and other health studies*, etc..

Having considered the likely the impacts on the local environment and amenity taking into account the criteria set out in Appendix B to National planning policy for waste, and being satisfied, in light of the consultation responses from the relevant bodies, that control processes, health and safety issues or emissions can or will be adequately addressed by the relevant regulatory body, it is considered the development is an acceptable use of the land in accordance with its development plan allocation as a site suitable for waste management operations.

Refuse odours and flies –

A number of representations have referred to the potential for stored waste materials to smell and/or attract flies. Control of odours and flies is principally a matter for good site management, and it cannot be assumed that there would not be good management in this case. It follows that concerns in relation to potential odours and flies would not amount to a sustainable reason for refusing planning permission. As already stated, National Planning Policy states that '*When determining waste planning applications, waste planning authorities should: …concern themselves with implementing the planning strategy in the Local Plan and not with the control of processes which are a matter for the pollution control authorities. Waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced'*. The Environment Agency has advised that when issuing an Environmental Permit for this site it will require the operator to take all appropriate measures to prevent or minimise the emission of offensive odours, flies and vermin. It follows that concerns in relation to potential odours and flies would not amount to a sustainable reason for refusing planning permission. For similar reasons the risks of fires at the site cannot amount to a planning reason for refusal. Noise levels from operation of the odour control equipment can be a matter for conditions.

Part of the Environmental Permitting process requires detailed management systems to be developed, these include site specific management, monitoring and mitigation plans for noise, dust, odour, vermin, flies and also a Fire Prevention Plan to be approved.

Other residential amenity considerations –

The application site lies within an industrial setting where there are other large 'factory' buildings. Within this context, and in view of the significant separation from the nearest residential properties, it is not considered that the proposed buildings and stacks in themselves would have a harmful impact in terms of overlooking, overshadowing and/or being overbearing.

9.6 Heritage Assets

Policy background –

The Planning (Listed Buildings and Conservation Areas) Act 1990 places a duty upon local planning authorities in determining applications for development affecting listed buildings to have special regard to the desirability of preserving the special interest and setting of the listed building.

Core Policy 58 (ensuring the conservation of the historic environment) of the Wiltshire Core Strategy states that new development should protect, conserve and where possible enhance the historic environment.

Paragraph 194 of the NPPF states that when considering the impact of proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation; and the more important the asset, the greater the weight should be. Substantial harm to or loss of designated heritage assets of the highest significance should be wholly exceptional.

Paragraph 195 states that where a proposed development would lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that, in particular, the substantial harm or loss is necessary to achieve substantial public benefits that outweigh the harm or loss. Paragraph 196 states that where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal. Paragraph 197 continues that the effect of an application on the significance of a non-designated heritage asset should be taken into account and a balanced judgment made.

Historic England defines significance as "*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting*". Setting is the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

Heritage Impact Assessment –

The ES includes a chapter relating to heritage, informed by a Heritage Impact Assessment (1 September 2018). It identifies no heritage assets on the application site, which is agreed. Further afield there are various assets, although most – such as listed buildings within Westbury town centre – are sufficiently distanced from the site and/or have such intimate settings so as to be not affected by the proposal.

The impact on five 'within 2km' assets have been assessed – Brook Farmhouse (Grade II listed building), Storridge Farmhouse (Grade II), Brook Hall (Early Wing (Grade I), the Hall (Grade II) and the Barn (Grade II)), the 'Medieval Settlement and associated field systems of Brook Farm' (Scheduled Monument), and 'the Moated Site 400m east of Penleigh House (Scheduled Monument). Beyond 2km other sites with inter-visibility have also been assessed – 'Bratton Camp Iron Age hillfort, the Westbury White Horse, barrows and trackways on Bratton Down' (Scheduled Monument), 'The Devil's Bed and Bolster long

barrow' (Scheduled Monument), Park Court in Upton Scudamore (Grade II* listed building), and 'Bowl Barrow north of White Horse Farm' (Scheduled Monument).

In relation to the listed buildings the ES states that there would be inter-visibility with some, but the separations and/or the context (where there are already other industrial buildings within views) means that the settings would not be detrimentally affected. The ES concludes 'no harm' to 'minor adverse' effects only.

The Council's Conservation Officer broadly agrees, although considers that there would, in fact, be a degree of harm to the setting of Brook Farm, which should be considered as 'less than substantial'. In such situations the NPPF requires a balanced approach, with any 'harm' caused to the significance of the heritage asset being weighed against the public benefits which may arise through the implementation of the development. In this case there are public benefits – notably the delivery of a handling and disposal service for the area's waste, in accordance with the sustainable development objectives of the NPPF and on land allocated for this purposes. This benefit and circumstance 'tips the balance' in favour of the development rather than in favour of the minor harm to the setting of the listed building.

In relation to the Scheduled Monuments, similar conclusions are drawn – either there is no inter-visibility or the wider settings are already influenced by established industrial development, railway lines or the urban form of Westbury as a whole. Views from the site towards the closest monument – Moated Site 400m east of Penleigh House – are not considered to contribute towards its significance, which relates mostly to its historic and archaeological interest. It follows that there would be no harm caused to these assets.

The White Horse monument is approximately 5km from the site, and at this distance, and in the context of the town, it is not considered that any harm would be caused to its setting.

For similar reasons there would be no harmful impacts on non-designated heritage assets.

The Council's Conservation Officer has assessed heritage assets independently. The outcome is the same – that is, the impact on assets is neutral or, in one or two cases (notably Brook Farm), the harm is less than substantial, lessened further by the revisions to the design of the development now proposed. Where the harm is less than substantial the public benefits arising from providing the ATT facility tip the balance in favour of the proposal in any event.

To conclude, it follows that there are no grounds for refusing planning permission for heritage related reasons.

9.7 Biodiversity

The Environmental Statement includes a chapter on biodiversity. It is informed by recent surveys carried out at the site (updated 28 September 2018).

In view of the circumstances of the site – essentially open land within an industrial estate – the ES reasonably concludes that the site contains 'common habitat' of non-high conservation status; no positive signs of any wildlife were recorded during the surveys.

A one-hole outlier badger sett was observed. As it would not be possible to protect this in situ, the proposed mitigation strategy is to exclude badgers and close the sett under Natural England licence. This is an acceptable approach, and accordingly a condition is recommended for this, together with other mitigation set out in the ES / Ecological Appraisal to be carried out.

9.8 Drainage

The application site lies within Flood Zone 1 and so has a low probability (less than 1 in 1,000 annual probability) of river [or sea] flooding.

The Northacre Industrial Estate was designed with a surface water drainage system to cope with all developments within it, and the proposal would connect to this. The operations on the site would have their own contained drainage as well, and would conform to standard requirements in terms of interceptors and flow charge rates. It follows that there are no surface water drainage issues arising.

Foul water would discharge to mains, and there is no objection to this from Wessex Water. This is subject to no surface water connections to the foul system.

9.9 Climate Change

The Environmental Statement considers the issue of climate change in terms of both the impact of the proposed development on climate and climate change, and the impact of climate change on the proposed development and its implementation.

The proposed development would emit carbon dioxide as this is an inevitable consequence of thermal treatment of wastes. Carbon dioxide emissions would be addressed in the Environmental Permit requirements, as already discussed. There would be no increase in energy demand as the energy requirements of the development would be drawn from the energy produced. Surplus energy produced would be exported in the form of electricity and heat. Emissions associated with transport would reduce as the development would result in some 2,000 fewer HGV movements (associated with the present export of SRF); and less movements than the potential B1, B2 or B8 use of the site.

The proposal would result in other emissions as previously covered. These would comply with all relevant air quality objectives, and would in any event be subject to the Environmental Permit conditions.

The proposed development would not increase water demand and would not affect any aquifer.

Overall, the proposal would not have a significant effect on climate change, and measures would not be required to protect the development from climate change effects.

10. Conclusion

In view of the application site lying within an industrial estate which is designated as a Strategic Scale Waste Site in the Wiltshire & Swindon Waste Site Allocations Local Plan, there can be no objection to the principle of a ‘strategic’ waste recovery (energy from waste) facility here. Indeed, it is logical to contain such a facility on a site adjacent to another now established waste processing facility which is producing a fuel component for the proposed waste recovery facility – namely the Mechanical Biological Treatment operation. Accordingly there are benefits for sustainability – both in environmental and economic terms – in allowing a waste recovery facility in this location.

It is relevant that the application site already benefits from planning permission for an ATT (energy from waste) facility granted in 2015. This is an important material consideration which must be given significant weight. The current proposal seeks to amend the design – notably by enlargement of the buildings and stacks – to accommodate different equipment and plant, although with a similar net output.

The earlier (2018) application, which also sought to revise the design of the development, was refused planning permission for a single reason relating to the impact of that scheme on the character and appearance of the area and the wider landscape. The current application presents an alternative revised design in which the building and plant is reconfigured (allowing a slight reduction in height, a reduction in overall floor space, and a reduction in 'bulk' of the west facing elevation), and with external cladding materials re-coloured. A comprehensive revised Landscape and Visual Impact Assessment continues to conclude that the effects on views of the site are, in the main, insignificant; and in terms of local landscape character, 'just' slight adverse effects arise against the baseline of the extant planning permission *and* an expanding industrial estate. It follows that 'effects' on landscape are inevitable in any event; and with this on the 'balance' – together with all other material considerations, including the wider benefits for waste management in general – it is not considered to be a sustainable reason for refusing planning permission.

In terms of other detail, the planning application and the Environmental Statement demonstrate that there would be no adverse impacts – or significant effects – on matters of acknowledged importance – notably, the capacity of the highway network, the amenities and well-being of neighbours and the wider Westbury community, heritage assets, ecology and drainage. Specifically on emissions, this is one of various technical matters for separate Environmental Permitting, but in any event the application has demonstrated that the development would operate in accordance with relevant standards and regulations. The effects on visual amenity are, in the main, not significant. The single adverse visual effect on one receptor – that is, the nearby footpath north-west of Brook Farm – does not 'turn the balance' against the proposal having regard to its benefits – notably in terms of improved waste management – and the neutral effects in the majority of other regards.

Environmental Statement –

Environmental information relevant to the proposal has, in the first place, been examined by the applicant, and the information and outcomes of the examination are set out in the Environmental Statement. Wiltshire Council has undertaken its own examination and, where necessary, supplementary examination of the information in the ES. Based on its examination – as set out in this report – Wiltshire Council can reach a reasoned conclusion on the effects of the proposal on the environment.

The reasoned conclusion is as set out above – that is, there are no effects of such significance to prevent planning permission from being granted in this case. Where there are effects – for example, the effects on air quality, transport and biodiversity – these are, in the main, not significant adverse effects. On visual impact, there are some slight-moderate adverse effects from certain receptors and a significant adverse effect on one receptor located close to the proposed development (specifically, the footpath north-west of Brook Farm). In the context of the whole development – and when applying the 'planning balance' – this single effect is considered to be acceptable, and so there are no material considerations of 'great weight' arising from the Environmental Impact Assessment process.

Monitoring measures are not required beyond standard planning conditions relating to, for example, landscaping, highways works, and noise monitoring.

This conclusion in respect of the ES process is up to date in the context of this ES, produced in October 2018.

RECOMMENDATION

Having taken into account the environmental information, it is recommended to grant planning permission subject to the following conditions –

1 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

REASON: To comply with the provisions of Section 91 of the Town and Country Planning Act 1990 as amended by the Planning and Compulsory Purchase Act 2004.

2 The development hereby permitted shall be carried out in accordance with the following approved plans:

18616-G-03 (Location Plan) dated 10/18
040_A05 REV D (Site Plan) dated 01/09/18
040_A07 REV E 1 to 4 (Site Elevations) dated 01/09/18
040_A08 REV D (Floor Plan) dated 01/09/18
040_A09 REV D (Site Section Levels) dated 01/08/18
040_A10 REV D (Site Traffic Route Plan) dated 01/09/18
NOR-LPO1 REV C (Landscape Plan) undated

REASON: For the avoidance of doubt and in the interests of proper planning.

3 Notwithstanding the details set out in the application particulars, no development shall commence on site until details of the colours for the building's external cladding have been submitted to and approved in writing by the Local Planning Authority. Development shall be carried out in accordance with the approved details.

REASON: These details are required to be agreed with the Local Planning Authority before development commences in order that the development is undertaken in an acceptable manner, in the interests of visual amenity and the character and appearance of the area.

4 The un-loading, storage and re-loading of waste materials shall take place inside the buildings hereby approved only, and shall not take place at, on or over any other parts of the application site.

REASON: To comply with the terms of the planning application and its justification, and to ensure the amenities of the wider environment are safeguarded.

5 The total tonnage of waste material delivered to the site shall not exceed 118,500 tonnes in any twelve month period.

REASON: To ensure that the development substantially accords with the terms of the Transport Assessment and Environmental Statement which accompany the planning application, and their conclusions that this scale of operation would not cause harm to matters of acknowledged importance.

6 A record of the quantity (in tonnes) of waste materials delivered to the site and all the waste-derived products despatched from the site shall be maintained by the operator of the site and made available to the local planning authority upon request. All records shall be kept for at least 36 months.

REASON: In order that the local planning authority can monitor the approved

development.

7 Heavy Goods Vehicle (HGV) deliveries to and removals from the site of waste materials shall be limited to the following times:

Monday to Friday: 07:00 to 22:00
Saturdays: 07:00 to 17:00

There shall be no deliveries or removals on Sundays or Bank Holidays.

REASON: To safeguard the amenities of the wider area.

8 All soft landscaping comprised in the approved details of landscaping shall be carried out in the first planting and seeding season following the first operation of the facility or the completion of the development whichever is the sooner; All shrubs, trees and hedge planting shall be maintained free from weeds and shall be protected from damage by vermin and stock. Any trees or plants which, within a period of five years, die, are removed, or become seriously damaged or diseased shall be replaced in the next planting season with others of a similar size and species, unless otherwise agreed in writing by the local planning authority. All hard landscaping shall also be carried out in accordance with the approved details prior to the occupation of any part of the development or in accordance with a programme to be agreed in writing with the Local Planning Authority.

REASON: To ensure a satisfactory landscaped setting for the development and the protection of existing important landscape features.

9 No part of the development hereby permitted shall be brought into use until the access, turning area and parking spaces have been completed in accordance with the details shown on the approved plans. The areas shall be maintained for those purposes at all times thereafter.

REASON: In the interests of highway safety.

10 No external lighting shall be installed on site until plans showing the type of light appliance, the height and position of fitting, illumination levels and light spillage spillage in accordance with the appropriate Environmental Zone standards set out by the Institute of Lighting Engineers in their publication "Guidance Notes for the Reduction of Obtrusive Light" (ILE, 2005)", have been submitted to and approved in writing by the Local Planning Authority. The approved lighting shall be installed and shall be maintained in accordance with the approved details and no additional external lighting shall be installed.

REASON: In the interests of the amenities of the area and to minimise unnecessary light spillage above and outside the development site.

11 There shall be no surface water discharge connection to the foul water network.

REASON: To safeguard the integrity of the foul water network and prevent flooding.

12 No development hereby approved shall take place until a site specific Construction Environmental Management Plan has been submitted to and been approved in writing by the local planning authority. The plan must demonstrate the adoption and use of the best practicable means to reduce the effects of noise, vibration, dust and site lighting during construction. The plan should include, but not be limited to:

- Procedures for maintaining good public relations including complaint management, public consultation and liaison
- Arrangements for liaison with the Council's Public Protection Team
- All works and ancillary operations which are audible at the site boundary, or at such other place as may be agreed with the Local Planning Authority, shall be carried out only between the following hours:
  08 00 Hours and 18 00 Hours on Mondays to Fridays and 08 00 and 13 00 Hours on Saturdays and; at no time on Sundays and Bank Holidays.
- Construction deliveries to and removal of plant, equipment, machinery and waste from the site must only take place within the permitted hours detailed above.
- Mitigation measures as defined in BS 5528: Parts 1 and 2 : 2009 Noise and Vibration Control on Construction and Open Sites shall be used to minimise noise disturbance from construction works.
- Procedures for emergency deviation of the agreed working hours.
- Control measures for dust and other air-borne pollutants.
- Measures for controlling the use of site lighting whether required for safe working or for security purposes.
- Construction traffic routes.

REASON: In the interests of the amenities of surrounding occupiers during the construction of the development.

13 No part of the development shall be brought into use until a Green Travel Plan has been submitted to and approved in writing by the Local Planning Authority. The Travel Plan shall include details of implementation and monitoring and shall be implemented in accordance with these agreed details. The results of the implementation and monitoring shall be made available to the Local Planning Authority on request, together with any changes to the plan arising from those results.

The Travel Plan shall include provision for car sharing and for ultra low energy vehicle infrastructure (electric vehicle charging points).

REASON: In the interests of air quality and reducing vehicular traffic to the development.

14 Prior to first operation of any plant, noise mitigation measures for the plant shall be installed in accordance with the specifications set out in the 'Noise and Vibration' chapter (chapter 6) of the Environmental Statement dated 11 October 2018 accompanying the planning application. The mitigation shall be retained and maintained thereafter.

Within 3 months of any plant having become first operational a noise assessment shall be carried out by an independent consultant to confirm compliance with the noise predictions set out in the Environmental Statement. The outcomes of the noise assessment shall be provided in writing to the local planning authority for agreement in writing no later than 1 month after the initial 3 month period. In the event that the noise assessment finds that the noise predictions have been exceeded then details of additional mitigation measures shall be provided as part of the noise assessment together with a timeframe for installation. The additional mitigation shall then by installed in accordance with the agreed noise assessment and retained and maintained thereafter.

REASON: To protect local amenity from the adverse effects of noise.

15 Prior to the development hereby approved becoming first operational an odour

management plan (for the management of odours, should they arise) and a pest management plan (for the management of flies, vermin, etc., should they arise) shall be submitted to the local planning authority for approval in writing. Thereafter, the approved plans shall be implemented as approved, if/as necessary.

REASON: To safeguard amenity.

16 The development hereby permitted shall be carried out strictly in accordance with the Mitigation Measures for biodiversity set out in the 'Biodiversity' chapter (chapter 8) of the Environmental Statement dated 11 October 2018 accompanying the planning application.

REASON: To safeguard wildlife.

17 INFORMATIVE: This activity will require a bespoke installation environmental permit issued by the Environment Agency (EA). As part of the environmental permitting process, the EA assess all applications to ensure that they meet the requirements of the Environmental Permitting Regulations. During assessment, the design of the plant is reviewed, as well as how it will be operated, the emissions it will generate (to air, water and land) and whether emissions will have an adverse impact on people living nearby and the natural environment. The EA do this by consulting partner organisations, such as Natural England (experts on impacts on wildlife) and Public Health England (experts on human health impacts). Emissions limits and techniques used to protect the environment and human health are set by the EU Industrial Emissions Directive (IED). In order to achieve the limits set by the IED the operator will need to show that they will use Best Available Techniques (BAT). The EA cannot set environmental permit conditions that go beyond what is specified by the IED and BAT.

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Northacre

Renewable Energy

Revision of the layout and design of the Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM at Stephenson Road, Northacre Trading Estate, Westbury, BA13 4WD

Non-technical summary of the Environmental Statement

October 2018

Introduction

Northacre Renewable Energy Ltd (a company set up by the Hills Group) proposes to develop and operate an advanced thermal treatment facility on land between Arla Foods Westbury Dairies and Northacre Resource Recovery Centre (RRC) on Stephenson Road in the Northacre Trading Estate, Westbury.

The Hills Group is one of Wiltshire's largest employers with over 400 staff working across the regions it serves. Established in 1900, The Hills Group is a privately owned family company with a broad and successful portfolio of business activities which include recycling and waste management; quarrying of aggregates and production of ready-mixed concrete; and building new homes. From its base in Wiltshire, Hills serves customers in central Southern England and Wiltshire.

Hills Waste Solutions, which is part of The Hills Group, operates the Northacre RRC under contract with Wiltshire Council.

The proposed development is a modification of the design of an advanced thermal treatment facility, which already has planning consent (ref 14/12003/WCM).

An application for revisions to the layout and design was initially submitted in April 2018 (ref 18/03816/WCM) and, despite being recommended for approval, was refused in July 2018 on the grounds that the *"proposed development, by reason of its height, bulk and location on rising ground on the edge of the built-up area, would have an adverse impact on the appearance of the area. This would conflict with Core Policy 51 in the Wiltshire Core Strategy, which seeks to protect, conserve and enhance the visual amenity of the landscape."*

This application relates to further revisions to the approved layout and design, which address the reasons for refusal of the April 2018 application. The changes to the development as already approved in 2015 can be summarised as follows:

- Increased height of buildings to incorporate more efficient boiler system and to facilitate safe access around the boiler plant.
- Increase in stack heights to comply with emerging Environment Agency guidance on Best Available Technique.
- Enclosure of the thermal process plant (gasifier, boiler and turbine) to assist in year-round operations and maintenance.
- Installation of one fewer turbine and a reduced bank of Air Cooled Condensers due to improved efficiencies in the process.

The proposed development uses advanced thermal treatment technology to generate electricity and heat from a mix of solid recovered fuel (SRF) and commercial and industrial waste that would otherwise be exported to mainland Europe as SRF or landfilled in Wiltshire respectively. Some 25.5 MW electricity / year will be generated.

The Environmental Statement

Environmental impact assessment (EIA) is the process by which the positive and negative environmental effects of a proposed development are identified before development consent is granted. The report documenting the outcome of the EIA process is called an Environmental Statement (ES).

This non-technical summary accompanies the ES and provides a simplified overview of the contents of the ES.

The full ES is available for viewing at Wiltshire Council, County Hall, Bythesea Road, Trowbridge or can be downloaded from www.northacre-energy.co.uk. Full copies of the application including the ES can be provided on CD for £10.

Assessment of environmental impacts

Following a detailed scoping exercise in 2014, as part of the successful, planning application, the topics identified for further investigation in the EIA were air quality, noise, landscape and visual impact, transport and access, archaeology and cultural heritage. This current assessment has also included biodiversity and nature conservation and climate change but has excluded archaeology from consideration given the findings of the previous assessment. The findings of the EIA process under each of these topic headings are given below. The EIA also considers cumulative effects and includes a detailed description of the development and a chapter on the policy context.

Policy support for the proposed development

The proposed development has been assessed against prevailing planning policy at the national and local level.

The proposed development is an appropriate use of the site.

Northacre Trading Estate is identified in Core Policies 32 and 35 of the adopted Wiltshire Core Strategy as a Principal Employment Area and in the adopted Waste Site Allocations Plan as suitable for 'Materials Recovery Facility / Waste Transfer Station, Local Recycling and Waste Treatment'

The proposed development is in accord with policies on climate change, design and appearance, ecology and nature conservation, economy, pollution, archaeology and cultural heritage, visual impact, traffic and transport, waste management and water resources.

Air quality

Detailed atmospheric dispersion modelling has been undertaken to assess the effects of emissions from the proposed development.

The results of the dispersion modelling and assessment demonstrate that, with a stack height of 75 m, the maximum predicted concentrations of all substances emitted comply with relevant air quality objectives at nearby sensitive locations, including residential areas and nature conservation sites, and the air intake of the adjacent Westbury Dairies.

Noise

A noise assessment was undertaken, which calculated the potential impact of noise levels arising from the proposed development at the nearest residential receptors during both daytime and night time.

The assessment showed that with the implementation of appropriate mitigation measures, noise at the nearest residential receptors would be below background for all six receptors.

Biodiversity and nature conservation

An ecological survey has been undertaken which found that the proposed development site contains common habitat, which is not scarce, threatened or of high conservation status.

No positive signs of any wildlife of note were recorded during the surveys. There is a small, outlier badger sett on the site boundary, which has its entrance outside the site and the scrub vegetation on the site has the potential to be used by nesting birds. Mitigation measures have been specified, implementation of which, will ensure adequate protection of badgers and nesting birds so that there are no residual effects.

Landscape and visual impact

The potential landscape and visual impact of the proposed development has been assessed through field and desk studies and the preparation of photomontages of before

and after views from viewpoints agreed with Wiltshire Council.

The effect on the important visitor destination viewpoint adjacent to the Westbury White Horse has been deemed to be moderate – slight adverse due to the distance from the site.

The majority of visual effects on long distance views have been categorised as slight adverse or moderate to slight adverse as the adjoining Westbury Dairies and other trading estate buildings are already very prominent features in the landscape.

There is a moderate-substantial adverse at a single viewpoint immediately following construction; this impact reduces to moderate adverse as the proposed landscaping matures.

Transport and access

Consideration of vehicle movements resulting from the proposed development shows that the proposed development will not have an impact on the local highway network.

The proposed development would add 41.5 HGV movements / day, routed to the Yarnbrook roundabout via the West Wilts Trading Estate and the B3097. From Yarnbrook, 31 of these movements would use the A350 to the north with the remaining 10.5 passing through Westbury on the A350 to the south.

Vehicle movements will be spread evenly over a 15 hour period meaning that there will be an additional 4 HGVs in the peak hour. This increase amounts to about 0.35% increase in traffic through the Yarnbrook junction. HGV traffic through the air quality management area in Westbury town centre will be equivalent to one additional HGV movement every 1.4 hours

Northacre Renewable Energy Ltd will put in place measures to help reduce reliance on cars and will develop a Green travel plan, which will be finalised when the site is operational. The design incorporates secure covered cycle parking and showers and lockers will also be provided for staff.

Heritage

The heritage assessment identified ten heritage assets within a 5 km radius of the proposed development that required assessment.

For the more distant heritage assets the proposed development is so far removed that it is insignificant.

For the five heritage assets within a 2 km radius, it is considered that the proposed development will have no impact on four of the assets.

There is a minor adverse residual effect on the setting of Brook Farmhouse, given its proximity to the proposed development.

Climate change

Consideration of climate change includes both the impact of the proposed development on climate and climate change and the impact of climate change on the proposed development and its implementation.

The proposed development will reduce greenhouse gas emissions, as it will generate energy from waste, which would otherwise be landfilled, and emissions associated with transport will reduce as the development will result in some 2,000 fewer HGV movements compared with the current situation.

In terms of potential effects of climate change on the development, it is not located in an area at risk of flooding nor are any special measures considered to be required to protect the development from extreme weather events.

Summary

The proposed development would divert waste from landfill, generate electricity from waste which is currently landfilled and recover valuable recyclables. It would also utilise SRF produced from Wiltshire's municipal waste, which is currently transported to mainland Europe.

There is one adverse effect arising out of the proposed development, which is classed as significant, namely that of the visual effect on users of the footpath north-west of Brook Farm.

The conclusions of the EIA are the same as those reached in the EIA undertaken in support of the approved development (ref 14/12003/WCM), which also recorded one significant adverse effect on users of the footpath north-west of Brook Farm.

In the context of the whole development, this single effect is considered to be acceptable and there are therefore no material considerations arising out of the EIA process.

In summary, the proposed development would:

- Be part of a local circular economy, turning waste into a fuel to generate renewable energy
- Generate local energy to power local businesses – 25.5 MW of electricity / year
- Deal with local waste, primarily from Wiltshire
- Create local employment – 40 permanent positions
- Promote a sustainable Wiltshire and Wiltshire's aspiration for a green economy.

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Team Manager
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Your Ref: 14/12003/WCM
Our Ref CIRIS 45991

09 November 2018

Dear Mr Tomsett,

Planning Application 18/03816/WCM

Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM

Address: Northacre Renewable Energy Stephenson Road Northacre Industrial Estate Westbury Wiltshire BA13 4WD

Thank you for consulting Public Health England (PHE) on the above application.

We understand that the proposed development relates to an application for the revision of the layout and design of the Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM at Stephenson Road, Westbury. It uses advanced thermal treatment technology to generate and export electricity and heat. It will process 48,000 tonnes of solid recovered fuel (SRF) and 112,000 tonnes of mixed commercial and industrial waste that would otherwise be landfilled in Wiltshire or exported to mainland Europe as solid recovered fuel (SRF).

We are conscious that if a planning permission is granted, the activity on site will also be subject to a permit issued by the Environment Agency under the provisions of the Environmental Permitting Regulations 2016. Additionally, emissions and impacts from the gasification process and ancillary waste handling activities will be governed by those conditions stipulated in that permit. The same regulations require the operator to use the best available technology to ensure that impacts from the site are minimised and are compliant with UK and EU air quality and emissions standards.

For that reason we have limited our consideration at the planning stage to the principle of land use, a consideration of the Environmental Impact Assessment (EIA) approach adopted by the applicant and type and range of submitted assessments.

PHE Position Statement

PHE has published a position statement on incinerators but we note that this application is specifically for a gasification process. This process differs from straightforward combustion and consequently the incineration position statement is not considered applicable in these circumstances. Details of the differences between incineration and thermal treatment can be found in the DEFRA publication Energy from waste, A guide to the debate, February 2014 (revised edition), pages 35 to 38. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf

Impacts during construction

As with any development there may be some localised short term impacts during the construction phase of the project. We note however, that a construction and management plan (CEMP) is included with the application and are happy that such impacts can be adequately managed by normal control measures and the use of industry good practice. Should issues such as noise or dust impacts arise during construction existing regulatory controls are considered adequate.

Air Quality

The applicant has modelled likely emissions from the site and considered the impact on local air quality. There are a number of sensitive receptors within 2km of the proposed plant including a powdered milk production facility, residential premises, commercial premises, recreation areas, schools and care homes. The submitted assessments have identified these receptors and assessed the impact of a range of emissions from the plant. No significant impacts have been identified in the documentation and PHE is satisfied that the applicant is utilising a model and assessment criteria that are in line with UK guidance and good practice.

There is an Air Quality Management Area (AQMA) in Westbury, declared on the basis of nitrogen dioxide, but we note that the predominant source of NO_2 in that area is vehicular traffic. The submitted assessments indicate that the additional contribution from either traffic associated with the proposed development or from stack emissions is likely to be small and consequently is unlikely to have a significant impact on public health.

On the basis of the information submitted with the application PHE is satisfied that the development/process should be capable of operating within the requirements of current UK regulations, air quality standards and emissions standards. Detail of the regulatory control, emissions requirements and monitoring requirements will be

considered in more detail as part of the environmental permitting process; however, on the basis of the information submitted to date PHE would be unable to sustain any objection to the development on the grounds of air quality.

Transport Impacts

PHE has only considered the impact of traffic on air quality and does not wish to comment on other matters such as noise although we note that as a result of the existing traffic burden the predicted increase in overall traffic levels as a result of both the construction and operational phases is predicted to be small. We are not in a position to assess the accuracy of the traffic predictions and should Wiltshire Highways department disagree with the applicants estimates we would be happy to reconsider this matter based on any new evidence.

Controlled Waters

The development/process is handling waste and consequently there is a potential for this to impact on the local environment and controlled waters. This matter is however better assessed by the Environment Agency and will be addressed by suitable permit conditions.

Contaminated Land

The applicant has submitted a site investigation report and no significant levels of ground contamination were identified. The CEMP should include a section on the management of contaminated soils if they are encountered during the development and consequently PHE is satisfied that historic contamination does not pose a risk to public health

Noise

PHE does not provide comments on noise at the present time.

Conclusion

PHE is satisfied that the applicant has approached the environmental impact assessment in a manner consistent with the UK requirements. They have utilised a satisfactory approach and methodology to predict the likely emissions, distribution of a range of key pollutants and the impact on the local environment and receptors.

PHE will further consider the emissions and appropriate control measures when we are consulted as part of the Environmental Permitting process and will make additional comments at that time. We are however satisfied that the applicant has demonstrated that the proposed development can be carried out without any

significant impact on health, subject to compliance with UK air quality and emission standards. For that reason we do not wish to raise any objection to this planning application.

We note that there appears to be some local opposition to the application and recommend that you liaise closely with your council's public health and health and wellbeing teams. This will ensure that they are aware of the application and local concerns and assess the wider public health implications and impacts on the local community.

If you have any questions or require any clarification please do not hesitate to contact us.

Yours sincerely

Allister Gittins
Environmental Public Health Scientist
crce-ehe@phe.gov.ukl

Addendum 1
Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury

P1713

A Report Prepared for
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by
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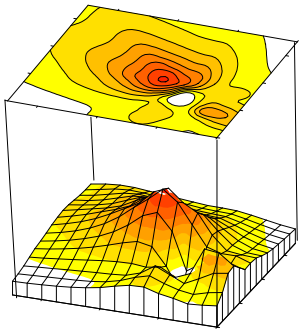

Principal Author: David Harvey BSc, MBA, FIAQM
Client: Hills Waste Solutions Ltd

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1 SUMMARY AND CONCLUSIONS

Hills Waste Solutions Ltd has commissioned Atmospheric Dispersion Modelling Ltd (ADM Ltd) to provide an **Addendum** to the February 2018 air quality assessment of emissions to atmosphere from Northacre Renewable Energy, to be located to the north of Westbury, Wiltshire (1).

The only changes to the previously submitted design that are relevant to the air quality assessment are modifications to the layout of the buildings and their heights. Previously, the maximum building height was 37.8 m which has been reduced to 36.8 m which will give rise to less building downwash, improved dispersion and a lowering of the resulting ground level pollutant concentrations.

Although the only change to the design of the proposed facility is beneficial in terms of impacts on air quality this Addendum has been prepared to quantify the reduction and update than conclusions of the previous assessment, where necessary. Also included is modelling with the most recent year of meteorological data.

This **Addendum** should be read and considered alongside the February 2018 Air Quality Assessment which provides full technical details.

The predictions presented in this Addendum show that the changes to building heights and layout make no discernible difference to the predicted short-term impacts and marginally reduce the long-term impacts. The predicted reduction in long-term (annual average) concentration is not sufficient to justify the re-modelling and assessment of the facility. The conclusions detailed in the submitted assessment (February 2018) are still valid and in light of the change in building dimensions should be viewed as being conservative.

2 EMISSIONS DATA

Given that the purpose of this Addendum is to determine the effect on dispersion of the changes to the building dimensions it is only necessary to consider one pollutant. The oxides of nitrogen (NO_x) has been selected as it is the principal pollutant for the proposed facility. **Table 2.1** shows the parameters which describe the physical properties of emissions from the stack, as required for definition of the emissions in dispersion modelling terms.

(1) ADM Ltd (22 Feb 2018) Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury.

Table 2.1 Emissions and Physical Properties, Main Stack

Parameter	Value		
Number of stacks	1		
Number of flues	2		
OS Grid Reference (m)	385774 152070		
Release height above ground level (m)	75		
	Flue 1	**Flue 2**	**Combined**
Exhaust gas flow rate ($Am^3\ hr^{-1}$)	99,720	99,720	199,440
Actual volumetric flow rate ($Am^3\ s^{-1}$)	27.7	27.7	55.4
Exhaust gas oxygen content (% v/v wet)	4.8	4.8	4.8
Exhaust gas water content (% v/v)	15.1	15.1	15.1
Flue diameter (m)	1.40	1.40	1.98 (a)
Exit velocity ($m\ s^{-1}$)	18.0	18.0	18.0
Flue gas emission temperature (deg C)	125	125	125
Normalised volumetric flow ($Nm^3\ s^{-1}$) (b)	24.9	24.9	49.9
Oxides of nitrogen (NO_x as NO_2, mg Nm^{-3}) (b)	200	200	200
Oxides of nitrogen (NO_x as NO_2, g s^{-1})	4.99	4.99	9.98

(a) Effective diameter of two flues.
(b) Corrected for: temperature; 273 k; pressure; 101.3kPa (1 atmosphere); dry; 11% v/v O_2.

3 BUILDING DOWNWASH

The presence of buildings can significantly affect the dispersion of the atmospheric emissions. Wind blowing around a building distorts the flow and creates zones of turbulence that are greater than if the building were absent. Increased turbulence causes greater plume mixing; the rise and trajectory of the plume may be depressed generally by the flow distortion. For elevated releases such as those from stacks, building downwash leads to higher ground level concentrations closer to the stack than those present if a building was not there. The effects of building down wash are usually only significant where the buildings are more than 40% of the stack height.

Table 3.1 shows the dimensions of the buildings included in the modelling. Other than the building information shown in **Table 3.1,** all the modelling input data and assumptions are the same as detailed in the February 2018 air quality assessment and are not reproduced in this Addendum.

Table 3.1 Dimensions of Buildings Included in the Modelling

Building	Centre (m)	Height (m) [(a)]	Length (m)	Width (m)	Angle (deg) [(b)]
1	385710 152027	36.8	30.9	37.1	57
2	385685 151984	31.2	59.2	37.0	57
3	385679 152020	31.2	30.2	30.3	57
4	385687 152046	16.8	31.6	20.3	57
5	385714 152064	23.5	32.5	20.3	57
6	385731 152045	21.5	24.7	29.9	57
7	385590 152110	40 [(c)]	50	25	43

(a) Height above ground level.
(b) Angle building length makes to north.
(c) Approximate height of highest building of the dairy.

4 PREDICTIONS

The principal pollutant released to atmosphere from the proposed facility is the oxides of nitrogen (NO_x) which will progressively oxidise to nitrogen dioxide (NO_2) in the atmosphere.

Table 4.1 shows the maximum predicted ground level concentration of nitrogen dioxide (NO_2) occurring as a consequence of emissions to atmosphere from the facility for each of the six years of meteorological data. The predictions include the effects of terrain and building downwash. Also shown are the predictions made using the previous building dimensions to allow for a direct comparison to determine the effect that the change in building layout and heights has made on dispersion. Also shown in the table are predictions made using 2017 meteorological data which was not available when the February 2018 assessment was prepared.

Table 4.1 ADMS 5.2 Maximum Predicted (Process Contribution) Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3}) [(a)]

Year	Annual Average		99.8th Percentile of Hourly Averages	
	Proposed	Previous	Proposed	Previous
2012	0.94	1.03	8.0	8.0
2013	0.67	0.74	7.8	7.7
2014	0.81	0.83	10.1	10.1
2015	0.93	0.94	8.4	8.4
2016	0.62	0.64	8.5	8.5
2017	0.80	0.84	8.9	8.8
Maximum	**0.94**	**1.03**	**10.1**	**10.1**
Assessment Criteria	**40**		**200**	

(a) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 4.1 shows that the changes to building dimensions and layout make no difference to the predicted short-term impacts and marginally reduce the long-term impacts. The predicted reduction in long-term (annual average) is not sufficient to justify the re-modelling and assessment of the facility.

The predictions made using 2017 are lower than the maximum for the years 2012 to 2017. If the assessment had been updated to use the most recent five years of meteorological data (ie 2013 to 2017) this would exclude the use of 2012 which gives rise to the highest impact. The exclusion of predictions made using 2012 meteorological data would reduce the maximum predicted concentrations.

The conclusions detailed in the submitted assessment (February 2018) are still valid and in the light of the change in buildings should be viewed as been conservative.

Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury

P1713

A Report Prepared for
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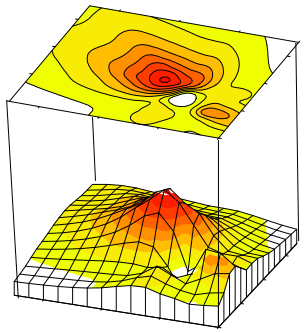

Principal Author: David Harvey BSc, MBA, FIAQM
Client: Hills Waste Solutions Ltd

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File=P1713\text\Northacre Renewable Energy AQ v10.doc	22 Feb 2018

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1 INTRODUCTION

Hills Waste Solutions Ltd has commissioned Atmospheric Dispersion Modelling Ltd (ADM Ltd) to undertake an air quality assessment of emissions to atmosphere from Northacre Renewable Energy, to be located to the north of Westbury, Wiltshire.

The technology being proposed is an advanced thermal treatment process known as gasification. The facility will have the capacity to convert 160,000 tonnes of a combination of high calorific solid recovered fuel (SRF) blended with lower calorific commercial and Industrial waste destined for landfill into a synthetic gas which is used on site to generate the 25.5 MWe of renewable energy. The products of combustion will be released to atmosphere via a single 75 m high twin flue stack.

Since the granting of planning permission on 23/9/2015 (Ref 14/12003/WCM) the technology provider for the gasifier has been changed which has given rise to changes to building locations and heights and a corresponding increase in the main and ventilation stack heights.

This assessment is an update of the previous assessment that was submitted to support the 2015 planning application (1).

During operation, emissions to atmosphere will occur from the following sources:

- Twin flue 75 m high stack
- 40 m high ventilation stack

The ADMS 5.2 dispersion model has been used to make predictions of ground level concentrations of the following pollutants released to atmosphere from the facility:

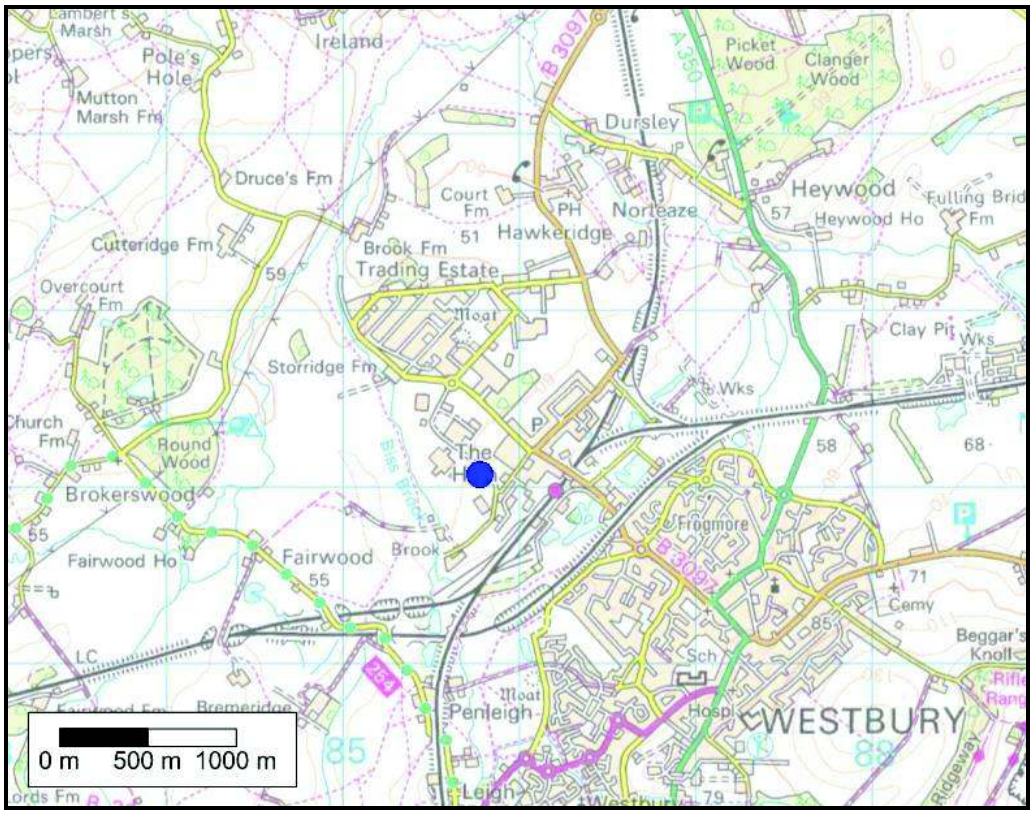
- the oxides of nitrogen (NO_x)
- sulphur dioxide (SO_2)
- fine particulate matter (PM_{10} and $PM_{2.5}$)
- carbon monoxide (CO)
- hydrogen chloride (HCl)
- hydrogen fluoride (HF)
- ammonia (NH_3)
- benzene (C_6H_6)
- dioxins and furans
- twelve metals
- polychlorinated biphenyls (PCBs)
- polycyclic aromatic hydrocarbons (PAHs)

Modelling has also been undertaken of emissions of odour and bio-aerosols from the 40 m high air extraction system stack.

(1) ADM (16 December 2014) Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury.

Figure 1.1 shows the location of the proposed facility.

Figure 1.1 Location of Northacre Renewable Energy



The remainder of this report is structured as follows:

- Section 2 - description of the assessment and significance criteria
- Section 3 - presents and assesses the existing air quality
- Section 4 - describes the modelling methodology
- Section 5 - presents the predicted concentrations (human health)
- Section 6 - presents the predicted concentrations (vegetation and ecosystems)
- Section 7 - sensitivity analysis
- Section 8 - mitigation and residual impacts
- Section 9 - provides a summary and conclusions

2 ASSESSMENT AND SIGNIFICANCE CRITERIA

2.1 INTRODUCTION

This section presents the planning context with regard to air quality, together with the assessment and significance criteria.

2.2 PLANNING CONTEXT

2.2.1 EUROPEAN LEGISLATION

The air quality criteria used in this assessment have been taken from European and national legislation and guidance.

Local authorities currently have no statutory obligation to assess air quality against European limit values but are encouraged to do so. In order to assist with longer-term planning and the assessment of development proposals in their local areas, Defra's Technical Guidance LAQM TG16 for Local Authorities provides guidance on how to assess against the time-frame of the European limit values (1).

The Air Quality (England) Regulations 2000 (SI 2000 No. 928) and Air Quality (England) (Amendment) Regulations 2002 (SI 2002 No. 3043) include national air quality objectives which, in most cases, are numerically synonymous with the European limit values although they may have different compliance target dates and can apply to different locations. The air quality objectives are for specific use by local authorities when undertaking their Local Air Quality Management (LAQM) duties in pursuit of Part IV of the Environment Act 1995. Of principal concern to this assessment are nitrogen dioxide (NO_2) and particulate matter smaller than 10 µm in aerodynamic diameter (PM_{10}).

2.2.2 NATIONAL LEGISLATION AND GUIDANCE

The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales & Northern Ireland Strategy (AQS), published in July 2007 in accordance with the requirements of Part IV of the Environment Act 1995. The Air Quality Strategy (AQS) sets out a framework to reduce adverse health effects from air pollution and ensures that international commitments are met. The AQS sets standards and objectives for pollutants to protect human health, vegetation and ecosystems.

Air quality objectives, limit values and guidelines which currently apply in the United Kingdom can be divided into four groups:

- United Kingdom air quality objectives set down in regulations for the purpose of Local Air Quality Management (LAQM);
- United Kingdom air quality objectives not included in regulations;
- European Union (EU) Limit Values transcribed into UK legislation; and
- Guidelines: eg World Health Organization (WHO) guidelines.

(1) DEFRA (April 2016) Local Air Quality Management, Technical Guidance LAQM TG16.

Many of the objectives in the Air Quality Strategy (AQS) were made statutory in England with the Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM).

The principal difference, with regard to the assessment of impacts on air quality, between the Air Quality Standards Regulations which implement EU Directives and the Air Quality (England) Regulations (as amended) is the location that they apply to. The Air Quality Standards Regulations apply to 'ambient air' which is defined as 'outdoor air in the troposphere, excluding workplaces where members of the public do not have regular access' which essentially is any off-site location. The Air Quality (England) Regulations apply to places where 'members of the public are regularly present' and this is interpreted as being 'regularly present' for the averaging time of the objective.

For example, the Air Quality (England) Regulations annual average objective apply to locations such as houses but not pavements whereas the Standards Regulations annual average limit values apply to any off-site location including pavements.

It should be noted that the Air Quality Standards Regulations 2010 do not supersede the 2002 regulations and are to ensure full compliance with the UK obligations under the various EU air quality directives. For the purpose of this assessment, which is to support the planning application to the Local Authority, the 2002 regulations are the most relevant assessment criteria.

2.2.3 REVIEW AND ASSESSMENT

Under Part IV of the Environment Act, local planning authorities must review and assess the air quality within their area by way of staged appraisals; with the aim of meeting the objectives by target dates defined in the Air Quality (England) (Amendment) Regulations. Where the air quality objectives are unlikely to be or have not been achieved by the target date, a local planning authority is required to designate an AQMA and to draw up an air quality action plan (AQAP) towards achieving air quality objectives in the future.

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local planning authorities in their review and assessment work (1).

2.2.4 NATIONAL PLANNING POLICY FRAMEWORK

In March 2012 the Department of Communities and Local Government published the National Planning Policy Framework (NPPF) (2). The purpose of the framework is to help achieve sustainable development. Section 11 of the policy makes the following references to air quality.

- The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely

(1) DEFRA (April 2016) Local Air Quality Management, Technical Guidance LAQM TG16.
(2) Department of Communities and Local Government (March 2012) National Planning Policy Framework.

affected by unacceptable levels of soil, air, water or noise pollution or land instability.

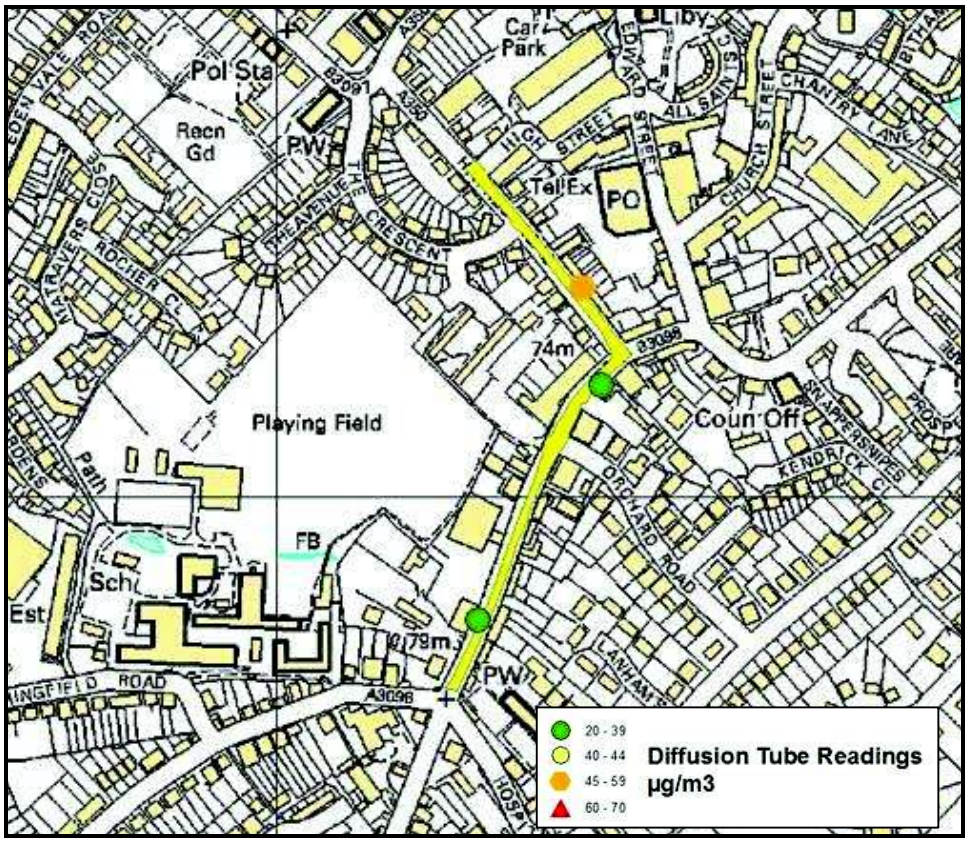
- Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure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

The National Planning Practice Guidance (NPPG) for air quality is available on the NPPG web site (1). The NPPG states that 'air quality concerns can be relevant to neighbourhood planning'.

2.2.5 LOCAL PLANNING GUIDANCE

Wiltshire Council has declared eight Air Quality Management Areas (AQMAs). The closest to the proposed development is the Westbury AQMA which is as shown in **Figure 2.1**. The effect of the proposed development on this the Westbury AQMA is considered in this assessment.

Figure 2.1 Westbury Air Quality Management Area (AQMA)



Source: www.wiltshire.gov.uk

(1) https://www.gov.uk/guidance/air-quality--3

Wiltshire Council has published an Air Quality Strategy for Wiltshire which sets out measures to maintain and improve air quality and also have an Air Quality Action Plan [1] [2].

2.2.6 IAQM GUIDANCE ON CONSTRUCTION DUST

In February 2014 the Institute of Air Quality Management (IAQM) published guidance on how to assess impacts of emissions of dust from demolition and construction sites [3]. The guidance is used in this assessment.

2.2.7 DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

In January 2017 the Institute for Air Quality Management (IAQM) and Environmental Protection UK published an update to its guidance document that contains a framework for air quality consideration to be accounted for in local development control [4]. The IAQM guidance has been taken into account when undertaking this assessment.

2.2.8 ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016

The Environmental Permitting (England and Wales) Regulations 2016 (referred to as EPR herein), came into force om 1 January 2017 [5]. The new Regulations revoke the Environmental Permitting (England and Wales) 2007 (and amendments) as well as the Environmental Permitting (England and Wales) Regulations 2010.

The PPC component of the EPR provides an integrated approach to controlling pollution from industrial sources. Its main aim is to achieve “a high level of protection of the environment taken as a whole…”, by measures designed to prevent or, where that is not practicable, reduce emission to air, water and land. An operator is required to obtain an EPR permit from the regulatory authority which for Part A installations is the Environment Agency which has responsibility for determining applications for permits and setting appropriate permit conditions.

The PPC programme has a number of objectives which include the setting of emission limit values based on the assessment of Best Available Techniques (BAT) and the consideration of any relevant site-specific issues. BAT is defined as “the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole”.

Activity-specific guidance for the sectors regulated under the EPR is available

(1) Wiltshire Council: Air Quality Strategy for Wiltshire 2011 to 2015.
(2) Wiltshire Council (June 2015): Air Quality Action Plan for Wiltshire.
(3) IAQM (February 2014) Guidance on the Assessment of dust from demolition and construction.
(4) IAQM (2017) Land-Use Planning & Development Control: Planning for Air Quality.
(5) Environmental Permitting Regulations (England and Wales) (Amendment) Regulations 2016.

to assist with the preparation of an application and the operation of a facility. In addition, supplementary guidance is available that is relevant to all sectors and is referred to as horizontal guidance for example H1 Environmental Risk Assessment [1].

An application will be made to the Environment Agency (EA) for a permit to operate the facility which will be required to comply with the requirements of the Industrial Emissions Directive (IED) [2].

2.2.9 ENVIRONMENTAL AGENCY GUIDANCE

The Environment Agency benchmark levels are used in this assessment where assessment criteria are not available from EU Directives or the Air Quality Strategy (AQS) [3].

2.3 DESCRIPTION OF POLLUTANTS

This section describes the principal pollutants considered in this assessment.

2.3.1 NITROGEN DIOXIDE (NO_2)

Where road traffic is the dominant source of air pollution, which is usually the case in urban environments, Local Authorities have found that the objectives for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) are the most difficult to achieve. It is also generally the case that, where annual average concentrations of nitrogen dioxide (NO_2) and fine particulate matter (PM_{10}) meet their respective objectives and where there are no other local significant sources of air pollution, concentrations of all other pollutants in the air quality strategy will also be achieved.

Nitrogen dioxide (NO_2) is a reddish brown gas (at sufficiently high concentrations) and occurs as a result of the oxidation of nitric oxide (NO), which in turn originates from the combination of atmospheric nitrogen (N_2) and oxygen (O_2) during combustion processes. In terms of ground level concentrations in many parts of the United Kingdom, concentrations of nitrogen dioxide (NO_2) are dominated by emissions from road transport. This applies particularly in urban areas, where traffic densities are at their highest.

2.3.2 PARTICULATE MATTER (PM_{10}, $PM_{2.5}$)

Particulate matter (PM) is a term used to describe all suspended matter, sometimes referred to as total suspended particulate matter. Sources of particles in the air include road transport, power stations and other industry, quarrying, mining and agriculture. Chemical processes in the air can also lead to the formation of particles. PM_{10} is the subject of health concerns because of the ability to penetrate and remain deep within the lungs. In recent years,

(1) https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.
(2) Directive 2000/76/EC of the European Parliament and of the Council (4 December 2000) on the incineration of waste. The requirements of WID are now maintained under Chapter IV and Annex VI of the Industrial Emissions Directive (IED) 2010/75/EC.
(3) Environment Agency (April 2010) Horizontal Guidance Note H1 - Annex (f).

epidemiological studies have shown increases in mortality correlated with concentrations of PM_{10} (COMEAP, 2009). There is increasing focus on $PM_{2.5}$ (particulate matter with an aerodynamic diameter of less than 2.5 µm) which gives a stronger association with ill-heath than PM_{10}. Given that $PM_{2.5}$ is a subset of PM_{10}. ie all $PM_{2.5}$ is also PM_{10}, consideration is made of the effects of $PM_{2.5}$ by making that conservative assumption that all the PM_{10} is $PM_{2.5}$.

It is sometimes claimed that PM_{10}/$PM_{2.5}$ or nanoparticulates (particles between 1 and 100 nanometres, nm) emitted to atmosphere from waste to energy facilities are somehow more ' toxic' than typical/normal prevailing background particulate matter. There is no evidence to support this, the health effects attributed to PM_{10}/$PM_{2.5}$ are derived from a large number of epidemiological studies from a full range of sources. In this context, the Health Protection Agency (HPA) state ' It is it is worth noting that PM_{10} and $PM_{2.5}$ samples from around the world can vary substantially in their chemical composition and size distribution but nonetheless exhibit similar concentration-response coefficients in time-series epidemiological studies.' (1)

2.3.3 SULPHUR DIOXIDE (SO_2)

Sulphur dioxide (SO_2) is a colourless gas which is produced from some natural processes, notably volcanoes, but is associated most strongly with the combustion of fossil fuels containing sulphur. When coal burning was more widespread in the UK than it is at present, sulphur dioxide (SO_2) concentrations were monitored extensively. Since coal has ceased to be used as a common fuel in homes, concentrations of sulphur dioxide (SO_2) in urban areas have fallen dramatically. Partly as a result of this improvement, sulphur dioxide (SO_2) is not regarded as a serious threat to air quality in the way it once was.

Sulphur dioxide (SO_2) is a potent respiratory irritant when inhaled at high concentrations, both in laboratory conditions and during air pollution episodes; especially for asthmatics.

2.3.4 OXIDES OF NITROGEN (NO_X)

The atmospheric pollutant of most concern for sensitive vegetation and best understood is the oxides of nitrogen (NO_x). Both the EU and WHO have set limit and guidelines for the annual average concentration of NO_x for the protection of vegetation. For the protection of vegetation and ecosystems there is an AQS objective and an EU target of 30 µg m^{-3} as an annual average This objective does not apply to locations within 5 km of built up areas of more than 5,000 people, or industrial sources regulated under Part A of the 1990 Environment Act. It also does not apply to locations within 20 km of towns with >250,000 inhabitants and does not apply in those areas where assessment of compliance with the limit value is not required. However, as UNECE and WHO have set a critical level for NO_x Natural England's policy is

(1) Health Protection Agency (September 2009) The Impacts on Health of Emissions to Air from Municipal Waste Incinerators

to apply the criteria as a benchmark, hence objective is used in the assessment

There is also a WHO guideline of 75 µg m^{-3} as a daily average which is also used in this assessment.

2.3.5 NITROGEN DEPOSITION

The deposition of nitrogen (N) from the atmosphere acts as a fertiliser which affects the natural balance of vegetation. The critical load for the deposition of nitrogen, normally expressed as Kg N ha^{-1} $year^{-1}$, is the exposure below which there should be no harmful effects on sensitive elements of the ecosystem. The critical loads vary for the type of ecosystem from as low as 5-10 Kg N ha^{-1} $year^{-1}$ for sensitive lichen found on mountain tops to 20-30 Kg N ha^{-1} $year^{-1}$ for some type of meadows.

2.3.6 DIOXINS AND FURANS

Dioxins and furans are a group of organic compounds that are formed as a result of incomplete combustion in the presence of chlorine. Sources include vehicles, domestic and industrial coal burning, power generation and incinerators.

There are no regulatory air quality standards set for dioxins and furans. This group of substances, however, are important in terms of the risk to human health. A human health risk assessment (HHRA) is the method by which the effect of dioxins can be assessed and has been undertaken for the proposed facility.

2.3.7 METALS

The metals considered in this report can be released from both natural sources and man's activities. The contribution of the possible sources varies for each metal, both temporally and spatially. Natural sources include windblown material, sea salt aerosols and forest fires. Manmade sources include metal industries, coal combustion, vehicles, cement production, fertiliser plants and incineration.

2.3.8 HYDROGEN CHLORIDE (HCL)

Hydrogen chloride (HCl) is a colourless gas at room temperature, which dissociates readily in water, forming an acidic solution. Sources of HCl include combustion of coal and waste incineration, although it is also produced from marine aerosols.

2.3.9 HYDROGEN FLUORIDE (HF)

Hydrogen fluoride (HF) is a colourless gas at room temperature, which dissociates readily in water, forming an acidic solution. Sources of HF include combustion of coal, steel, tile, brick and glass works and aluminium processing plants.

2.4 ASSESSMENT CRITERIA

2.4.1 AIR QUALITY

This section describes the criteria used to assess the impacts on air quality of emissions to atmosphere from the proposed facility, both in terms of the impacts on human health and vegetation and ecosystems.

The Environment Agency H1 guidance benchmark levels are used in this assessment where assessment criteria are not available from EU Directives or the Air Quality Strategy (AQS).

Table 2.1 shows the assessment criteria used in the assessment to assess the impacts on human health, vegetation and ecosystems which are the benchmark level detailed in the Environment Agency's risk assessment guidance (1).

The Environment Agency H1 guidance does not provide an assessment criterion for thallium (Tl) and therefore this metal has not been considered further. The Air Quality Strategy (AQS) includes a 15% exposure reduction target for $PM_{2.5}$ which cannot be assessed when considering the incremental impacts of a single development.

(1) https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

Table 2.1 Assessment Criteria

Substance	Averaging time	Assessment Criteria (µg m^{-3})
Particulate matter (PM_{10})	Annual mean 90.4th %ile of 24 hour means	40 50
Particulate matter ($PM_{2.5}$)	Annual mean	20
Benzene (C_6H_6)	Annual mean Maximum hourly mean	5.0 195
Hydrogen chloride (HCl)	Maximum hourly mean	750
Hydrogen fluoride (HF)	Annual mean Maximum hourly mean	16 160
Hydrogen fluoride (HF, vegetation)	Maximum 24 hour mean	5
Carbon monoxide (CO)	Maximum 8 hour mean	10,000
Sulphur dioxide (SO_2)	99.9th percentile of 15 minute 99.7th percentile of hourly means 99.2nd percentile of 24 hour	266 350 125
Sulphur dioxide (SO_2,vegetation)	Annual mean	10 to 20
Nitrogen dioxide (NO_2)	Annual mean 99.79th percentile of hourly means	40 200
Oxides of nitrogen (NO_x, vegetation)	Annual mean Maximum 24 hour mean	30 75
Ammonia (NH_3)	Annual mean Maximum hourly mean	180 2,500
Ammonia (NH_3, vegetation)	Annual mean	1 to 3
Cadmium (Cd)	Annual mean	0.005
Mercury (Hg)	Annual mean Maximum hourly mean	0.25 7.5
Antimony (Sb)	Annual mean Maximum hourly mean	5 150
Arsenic (As)	Annual mean	0.003
Lead (Pb)	Annual mean	0.25
Chromium (Cr)	Annual mean Maximum hourly mean	5 150
Chromium (Cr (VI))	Annual mean	0.0002
Copper (Cu)	Annual mean	10
Manganese (Mn)	Annual mean Maximum hourly mean	0.15 1,500
Nickel (Ni)	Annual mean	0.02
Vanadium (Vn)	Annual mean Maximum 24 hour mean	5 1
PAHs as benzo(a)pyrene	Annual mean	0.00025
Polychlorinated biphenyls (PCBs)	Annual mean Maximum hourly mean	0.2 6

2.4.2 ODOURS

The UK's Environment Agency H4 guidance suggests a range of benchmarks for unacceptable pollution, these are shown below [1].

- 1.5 OU_e m^{-3} 98th Percentile of Hourly Averages for ' most offensive' odours.
- 3.0 OU_e m^{-3} 98th Percentile of Hourly Averages for ' moderately offensive' odours.
- 6.0 OU_e m^{-3} 98th Percentile of Hourly Averages for ' less offensive'odours.

Table 2.2 shows the UK's Environment Agency examples a range of odours

Table 2.2 UK Environment Agency - Odour Characterisation

Category	Examples
Most Offensive	Processes involving decaying animal or fish remains Processes involving septic effluent or sludge Biological landfill odours
Moderately Offensive [a]	Intensive livestock rearing Fat frying (food processing) Sugar beet processing Well aerated green waste composting
Less Offensive	Brewery Confectionery Coffee roasting Bakery
(a) Most odours from processes fall into this category ie any odours which do not obviously fall within the 'most offensive' or 'less offensive' categories.	

The odour emissions from the proposed facility would be best categorised as being moderately offensive. Therefore, for the purpose of this assessment a benchmark of 3 OU_e m^{-3} 98th percentile of hourly averages is appropriate for assessment of the potential for annoyance.

2.4.3 BIO-AEROSOLS

Bio-aerosols are microscopic, airborne particles including bacteria, fungal spores, protozoa and organic constituents of microbial and fungal origin.

There is a wide range in natural background concentrations of bio-aerosols with measured concentrations reported in one paper ranging from 0 colony forming units (cfu) m^{-3} to 2,968 cfu m^{-3} [2]. There are no legal standards or guidelines for bio-aerosols concentration, the assessment criteria for bio-aerosols normally used is 1,000 (cfu) m^{-3}. This criteria is cited in a number of documents including the Environment Agency's (EA) guidance on monitoring around waste facilities and Environment Agency (EA) policy statement on

(1) Environment Agency (March 2011) Horizontal Guidance Note H4 Odour Management.
(2) Gilbert et al (May 2002) Preliminary Results of Monitoring the Release of Bioaerosols from Composting Facilities in the UK.

composting and potential health effects [1] [2]. It is however, unclear over what averaging time the benchmark of 1,000 (cfu) m^{-3} should be applied. It is understood that concentrations are normally measured using a hi-volume sampler over a 24-hour period and therefore this may be the most appropriate averaging period, however, the EA's M17 guidance states that the averaging period should be 8 hours.

It was reported in the 2008 air quality assessment for the Northacre Resource Recovery Centre that the key concern for Westbury Dairies in relation to bio-aerosols relates to the potential to affect existing air filtration system leading to increased operational and maintenance costs. This system is currently serviced on an annual basis, when the filters are replaced [3]. Given that the filters are replaced on an annual basis it is the annual average concentration of bio-aerosols that is of concern to the dairy.

It was reported in the 2008 assessment that Westbury Dairies have indicated that an increase in levels of bio-aerosols within 1 order of magnitude (ie a factor of 10) of existing backgrounds is broadly acceptable. Therefore, as existing background levels in the area have been measured at an average of 50 cfu m^{-3}, the assessment criteria at the location of the air intakes for the dairy is 500 cfu m^{-3}. Given that it is annual average loading that is of concern that criteria of 500 cfu m^{-3} is an annual average concentration.

2.5 SIGNIFICANCE CRITERIA

The Environment Agency's risk assessment guidance includes a test for insignificance. The risk assessment guidance states that the process contribution (PC) can be considered as insignificant if:

- the long term PC is <1% of the assessment criteria
- the short term PC is < 10% of the assessment criteria

This is not to say that if these thresholds are exceeded the process contribution (PC) is significant, just that it cannot be ruled out as being insignificant.

The Environment Agency (EA) does not provide guidance on what is an acceptable level of impact, so it is necessary to resort to alternative sources to determine if the predicted impacts are significant or not.

2.5.1 AIR QUALITY

The impact refers to the change that is predicted to take place to the prevailing environment as a result of the proposed development (ie the incremental increase or decrease in pollutant concentration).

The significance of an impact is generally determined by the combination of the 'sensitivity' and/or 'value' of the affected environmental receptor and the

(1) Environment Agency (2007) Policy Number 405_07 Our position on composting and potential health effects from bio-aerosols.
(2) Environment Agency (2003) M17; Technical Guidance Document Monitoring of Particulate Matter in Ambient Air Around Waste Facilities.
(3) SLR (December 2008) Northacre Resource Recovery Centre (RCC) Detailed Assessment of Air Quality.

predicted “extent” and/or “magnitude” of the impact or change. The impact descriptors used in this assessment are taken from the IAQM/EPUK guidance for planning and air quality (1). The assessment of significance ultimately relies on professional judgement, although comparing the extent of the impact with criteria and standards specific to each environmental topic can guide this judgement.

Details of impact descriptors used in this assessment are shown in **Table 2.3** It should be noted that the IAQM/EPUK impact descriptors refer to permanent changes in air quality brought about by a development and not short term or temporary changes. They also refer to locations where there is relevant exposure and not therefore necessarily the location of the maximum impact. The criteria therefore are only appropriate for changes to annual average concentrations at locations where there is relevant exposure; ie not generally the point of maximum impact.

Table 2.3 IAQM/EPUK Air Quality 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
102%-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Note: Changes less than 0.5% are Negligible.				

The IAQM guidance on significance shown in **Table 2.3** is only applicable to long term/annual average impacts.

IAQM provides the following guidance for peak short-term concentrations from an elevated source, as shown below.

Magnitude of Impact (percentage of relevant Air Quality Assessment Level, AQAL):

- 10-20% Small
- 20-50% Medium
- >50% Large

The corresponding severity of these impacts can be described as slight, moderate and substantial without the need to make reference to background or baseline concentration.

(1) Environmental Protection UK/IAQM (January 2017) Land-Use Planning& Development Control: Planning for Air Quality.

The Environment Agency's (EA) risk assessment guidance includes a test for insignificance of short term impacts [1]. The guidance states that the process contribution (PC) can be considered as insignificant if:

- the long term PC is <1% of the assessment criteria
- the short term PC is < 10% of the assessment criteria

This is not to say that if these thresholds are exceeded the process contribution (PC) is significant, just that it cannot be ruled out as being insignificant.

For the assessment of significance, this assessment uses the IAQM guidance.

2.5.2 ODOUR

The Institute of Air Quality Management (IAQM) has published guidance on the assessment of odour for planning [2]. As with air quality, the assessment of significance ultimately relies on professional judgement.

The IAQM guidance suggests three categories for receptor sensitivity and odour effect descriptors based on the sensitivity of the receptor and the magnitude of the impact.

Table 2.4 provides details of the receptor sensitivity and **Table 2.5** the odour effect descriptors.

Table 2.4 IAQM Receptor Sensitivity

Sensitivity	Description
High	Surrounding land where: • users can reasonably expect enjoyment of a high level of amenity; and • people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium	Surrounding land where: • users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or • people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
Low	Surrounding land where: • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads.

(1) https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

(2) Institute of Air Quality Management (IAQM, May 2014) Guidance on the assessment of odour for planning.

Table 2.5 IAQM Odour Effect Descriptors

Odour Exposure (C_{98}, $OU_e\ m^{-3}$) [(a)]	Receptor Sensitivity		
	Small	Medium	High
>10	Moderate	Substantial	Substantial
5-10	Moderate	Moderate	Substantial
3-5	Slight	Moderate	Moderate
1.5-3	Negligible	Slight	Moderate
0.5-1.5	Negligible	Negligible	Slight
<0.5	Negligible	Negligible	Negligible
(a) 98th percentile of hourly averages.			

The IAQM guidance on odours states: Where the overall effect is greater than 'slight adverse', the effect is likely to be considered significant. This is a binary judgement: either it is 'significant' or 'not significant'. Therefore, if the overall effect is not worse than 'slight adverse' then the impact is 'not significant'. Given that the IAQM approach for judging significance for odours is the same as air quality the test for significance is valid for both air quality and odours.

3 AMBIENT AIR QUALITY DATA

3.1 INTRODUCTION

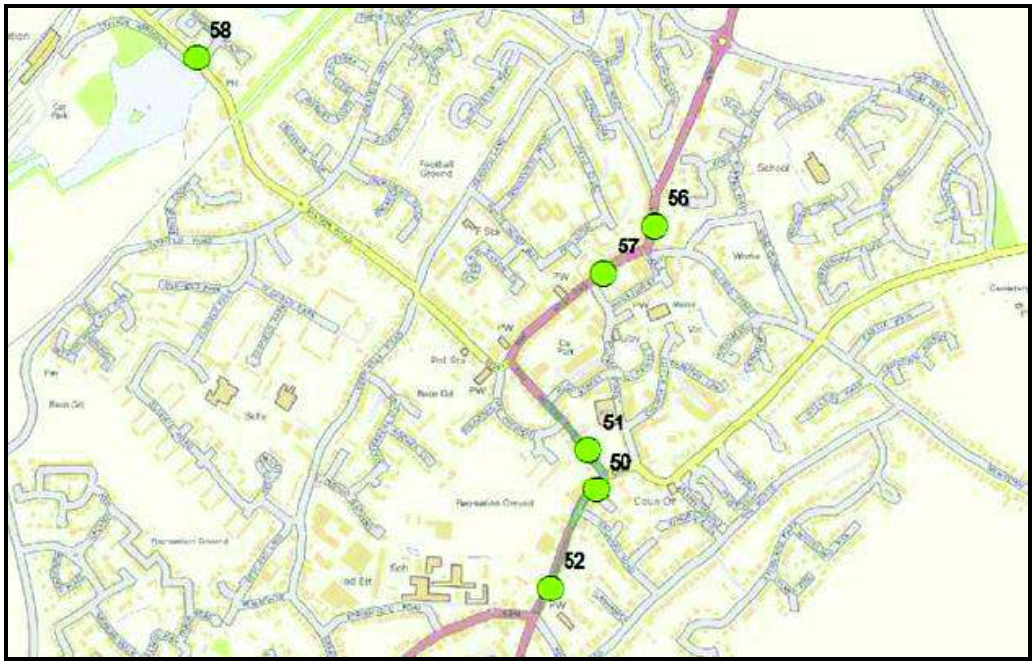
This section presents a description of the ambient air quality in the region of the proposed facility. Given the large degree of variation in pollutant concentrations, both with time and location, it is desirable to have measurements over a period of time that is long enough to ensure that a complete range of meteorological conditions and emissions have been experienced.

The criteria used throughout this assessment are compared to the incremental increase occurring due to emissions to atmosphere from the proposed facility and therefore an accurate determination of the prevailing concentration is not necessary. However, estimates of the prevailing background concentrations are presented for completeness.

3.2 MEASURED CONCENTRATION OF NITROGEN DIOXIDE (NO_2)

As part of on-going requirements to continually review and assess air quality, Wiltshire Council operates a monitoring network that includes both passive and continuous sampling. The closest locations where pollutant concentrations are measured is at road side locations in Westbury. **Figure 3.1** shows the location and where measurements of annual average road side concentration of nitrogen dioxide (NO_2) are made. There are no measurements made close to the location of the proposed facility.

Figure 3.1 Location of Nitrogen Dioxide (NO_2) Diffusion Tubes



Source: Wiltshire Council (May 2015) 2015 Updating and Screening Assessment

Table 3.1 provides details of the nitrogen dioxide (NO_2) diffusion tube monitoring sites shown in **Figure 3.1**.

Table 3.1 Details of Diffusion Tubes in the Locality of the Proposed Facility

Tube Number	Description	OS Grid Reference (m)	Distance from Site (km)
50	71 Warminster Road	387255 151087	1.8
52	76 Warminster Road	387157 150901	1.8
51	41 Haynes Road	387240 151164	1.7
57	23 West End	387269 151507	1.6
56	12 Fore Street	387369 151600	1.7
58	Primmers Place	386470 151928	0.7

Source: Wiltshire Council (June 2014) 2014 Progress Report

Table 3.2 provides details of the measured annual average concentration of nitrogen dioxide (NO_2) at each monitoring site; data are available for 2012 to 2016, the values presented are the bias adjusted values.

Table 3.2 Diffusion Tube Measured Annual Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3})

No.	Description	2012	2013	2014	2015	2016	Average
50	71 Warminster Rd	**50**	**45**	**45**	39	**49**	**46**
52	76 Warminster Rd	35	40	32	35	38	36
51	41 Haynes Road	38	**41**	27	40	**45**	38
57	23 West End	36	36	33	35	36	35
56	12 Fore Street	40	40	37	39	40	39
58	Primmers Place	-	28	-	-	-	28
Assessment Criteria				**40**			

Table 3.2 shows that there are two locations where the measured annual average concentration exceeds the Air Quality Strategy (AQS) objective for nitrogen dioxide (NO_2) which is an annual average of 40 µg m^{-3}, the exceedences are marginal.

3.3 ESTIMATED BACKGROUND CONCENTRATIONS

Defra estimate the background concentration for a number of pollutants for a number of years on a 1 km grid resolution for the whole of the UK.

Table 3.3 shows the Defra estimated background concentration closest to the proposed site for 2018.

Table 3.3 Estimated Annual Average Background Concentrations for 2018 at OS Grid Reference 385500, 152500 (µg m^{-3})

Pollutant	Defra Estimated Background	Assessment Criteria
Nitrogen Dioxide (NO_2)	9.9	40
Oxides of Nitrogen (NO_x)	13.3	30
Particulate Matter (PM_{10})	12.8	40
Particulate Matter ($PM_{2.5}$)	8.3	20
Sulphur dioxide (SO_2) [(a)]	2.6	10-20
(a) Data from 2001 which is most recent year available. Data for Wiltshire is unavailable so the average for North Somerset is used.		

Table 3.3 shows that the Defra estimated background concentration of nitrogen dioxide (NO_2) for 2018 of 9.9 µg m^{-3}, 13.3 µg m^{-3} for PM_{10} and 8.3 µg m^{-3} for $PM_{2.5}$ are all less than the Air Quality Strategy (AQS) objectives. It is considered that the background levels shown in **Table 3.3** provide a reasonable estimate of current concentrations in the region of the proposed facility. These values are used when assessing the impact of the proposed facility at its point of maximum impact.

3.4 SUMMARY OF AMBIENT POLLUTANT CONCENTRATIONS

Table 3.4 provides a summary of all the relevant background measured and estimated annual average pollutant concentration used in this assessment and the source of the data.

Table 3.4 Measured and Estimated Annual Average Background Pollutant Concentrations

Pollutant	Background Concentration	Unit	Data Source
Nitrogen dioxide (NO_2)	9.9	µg m^{-3}	Defra 2018 estimate
Oxides of Nitrogen (NO_x)	13.3	µg m^{-3}	Defra 2018 estimate
Particulate matter (PM_{10})	12.8	µg m^{-3}	Defra 2018 estimate
Particulate matter ($PM_{2.5}$)	8.3	µg m^{-3}	Defra 2018 estimate
Sulphur dioxide (SO_2)	2.6	µg m^{-3}	Defra 2001 estimate
Carbon monoxide (CO)	0.3	mg m^{-3}	Defra 2001 estimate
Hydrogen chloride (HCl)	0.07	µg m^{-3}	Measured 2013 Harwell
Hydrogen fluoride (HF)	3	ng m^{-3}	Slooff et al 1988
Antimony (Sb)	0.82	ng m^{-3}	Measured 2013 Harwell
Arsenic (As)	0.61	ng m^{-3}	Measured 2013 Harwell
Cadmium (Cd)	0.096	ng m^{-3}	Measured 2013 Harwell
Chromium (Cr)	0.96	ng m^{-3}	Measured 2013 Harwell
Chromium (Cr, VI)	0.19	ng m^{-3}	EA guidance upto 20% of Cr is Cr (VI)
Cobalt (Co)	0.06	ng m^{-3}	Measured 2013 Harwell
Copper (Cu)	2.7	ng m^{-3}	Measured 2013 Harwell
Lead (Pb)	4.7	ng m^{-3}	Measured 2013 Harwell
Manganese (Mn)	2.2	ng m^{-3}	Measured 2013 Harwell
Mercury (Hg)	1.1	ng m^{-3}	Measured 2013 Harwell
Nickel (Ni)	0.77	ng m^{-3}	Measured 2013 Harwell
Vanadium (Vn)	0.92	ng m^{-3}	Measured 2013 Harwell
Benzene (C_6H_6)	0.2	µg m^{-3}	Defra 2001 estimate
Dioxins	16.8	fg m^{-3}	Weybourne 2010
Ammonia (NH_3)	1.9	µg m^{-3}	Measured 2013 Harwell
Bio-aerosols	50	cfu m^{-3}	Measured 2008 [(a)]

(a) SLR (December 2008) Northacre Resource Recovery Centre (RRC), Detailed Assessment of Air Quality. Measurements were undertaken in April and May 2008.

Table 3.5 shows the measured/estimated background concentrations as a percentage of the assessment criteria.

Table 3.5 Measured and Estimated Annual Average Background Pollutant Concentrations Compared to Assessment Criteria for Human Health

Pollutant	Background Concentration	Assessment Criteria	Unit	Percentage of Assessment Criteria (%)
Nitrogen dioxide (NO_2)	9.9	40	µg m^{-3}	25%
Particulate matter (PM_{10})	12.8	40	µg m^{-3}	32%
Particulate matter ($PM_{2.5}$)	8.3	20	µg m^{-3}	42%
Sulphur dioxide (SO_2)	2.6	10-20	µg m^{-3}	13% to 26%
Carbon monoxide (CO)	0.3	-	mg m^{-3}	-
Hydrogen chloride (HCl)	0.07	-	µg m^{-3}	-
Hydrogen fluoride (HF)	3	16	µg m^{-3}	19%
Antimony (Sb)	0.82	5	ng m^{-3}	16%
Arsenic (As)	0.61	3	ng m^{-3}	20%
Cadmium (Cd)	0.096	5	ng m^{-3}	2%
Chromium (Cr)	0.96	5,000	ng m^{-3}	0%
Chromium (Cr VI)	0.19	0.20	ng m^{-3}	96%
Cobalt (Co)	0.06	-	ng m^{-3}	-
Copper (Cu)	2.65	10,000	ng m^{-3}	0%
Lead (Pb)	4.7	250	ng m^{-3}	2%
Manganese (Mn)	2.2	150,000	ng m^{-3}	0%
Mercury (Hg)	1.07	250	ng m^{-3}	0%
Nickel (Ni)	0.77	20	ng m^{-3}	4%
Vanadium (Vn)	0.92	5,000	ng m^{-3}	0%
Benzene (C_6H_6)	0.2	3.25	µg m^{-3}	6%
Dioxins	16.8	-	TEQ fg m^{-3}	-
Ammonia (NH_3)	1.9	180	µg m^{-3}	1%
Bioaerosols	50	1,000	cfu m^{-3}	5%

Table 3.5 shows that all the estimate/measured background annual average concentrations are less than the assessment criteria. It should be noted that the estimated background concentration of Chromium VI is derived from the measured concentration of total chromium using EA guidance. The EA suggest that, as a worst case, up to 20% of total Chromium can be assumed for screening to be Chromium VI (1). However, Defra guidance for metal and metalloids in ambient air for protection of human health suggest that the Chromium VI constitutes between 3% and 8% of total airborne chromium (2). Use of this estimated range suggests that the ambient concentration of Chromium VI in the range of 14% to 38% of the assessment criteria.

(1) Environment Agency (September 2012) Guidance to applicants on impact assessment for group 3 metals stack.
(2) Defra (May 2008) Consultation on guidelines for metals and metalloids on ambient air for the protection of human health.

4 METHODOLOGY

4.1 INTRODUCTION

This section describes the methodology and assumptions made for the air quality assessment. Also described are the emissions data used.

4.2 EMISSIONS DATA

The facility employs thermal decomposition to generate synthetic gas known as ‘syngæs’. The syngas is combusted at a temperature greater than 850 deg C with a residence time of more than 2 seconds, to comply with the requirements of the Industrial Emissions Direction (IED)) (1) (2). The heat generated from thermal decomposition is used to generate steam which drives a steam turbine.

The products of combustion pass through an air pollution control system which removes pollutants and ensures that the emissions to atmosphere comply with the requirements of IED. The emissions are released to atmosphere via a twin flue 75 m high stack.

Table 4.1 and Table 4.2 show the parameters which describe the physical properties of emissions from the stack, as required for definition of the emissions in dispersion modelling terms. These data are conservative estimates of the emission rates with the facility operating continuously at full load, in practice the installation is expected to operate for about 7,500 hours per year (85% of the time). Data are presented for each flue and for the combined emissions from the two flues.

Table 4.1 Emissions and Physical Properties, Main Stack

Parameter	Value		
Number of stacks	1		
Number of flues	2		
OS Grid Reference (m)	385774 152070		
Release height above ground level (m)	75		
	Flue 1	**Flue 2**	**Combined**
Exhaust gas flow rate ($Am^3 hr^{-1}$)	99,720	99,720	199,440
Actual volumetric flow rate ($Am^3 s^{-1}$)	27.7	27.7	55.4
Exhaust gas oxygen content (% v/v wet)	4.8	4.8	4.8
Exhaust gas water content (% v/v)	15.1	15.1	15.1
Flue diameter (m)	1.40	1.40	1.98 (a)
Exit velocity ($m s^{-1}$)	18.0	18.0	18.0
Flue gas emission temperature (deg C)	125	125	125
Normalised volumetric flow ($Nm^3 s^{-1}$) (b)	24.9	24.9	49.9

(a) Effective diameter of two flues.
(b) Corrected for: temperature; 273 k; pressure; 101.3kPa (1 atmosphere); dry; 11% v/v O_2.

(1) Directive 2010/75/EU (24 November 2010) on Industrial Emissions.
(2) Directive 2000/76/EC of the European Parliament and of the Council (4 December 2000) on the incineration of waste. The requirements of WID are now maintained under Chapter IV and Annex VI of the Industrial Emissions Directive (IED) 2010/75/EC

Table 4.2 shows both the pollutant emissions concentrations and emission rates.

Table 4.2 Pollutant Emission Concentration and Rates

Pollutant	Concentration [(a)]			Emission Rate (total for two flues)	
Oxides of nitrogen (NO_x as NO_2)	200	mg Nm^{-3}		9.98	g s^{-1}
Sulphur dioxide (SO_2)	50	mg Nm^{-3}		2.49	g s^{-1}
Particulate matter (PM_{10})	10	mg Nm^{-3}		0.50	g s^{-1}
Particulate matter ($PM_{2.5}$)	10	mg Nm^{-3}	(b)	0.50	g s^{-1}
Carbon monoxide (CO)	50	mg Nm^{-3}		2.49	g s^{-1}
Hydrogen chloride (HCl)	10	mg Nm^{-3}		0.50	g s^{-1}
Hydrogen fluoride (HF)	1	mg Nm^{-3}		0.05	g s^{-1}
Ammonia (NH_3)	10	mg Nm^{-3}		0.50	g s^{-1}
Benzene (C_6H_6)	1	mg Nm^{-3}		0.05	g s^{-1}
Cadmium (Cd)	0.025	mg Nm^{-3}	(c)	1.25	mg s^{-1}
Mercury (Hg)	0.05	mg Nm^{-3}		2.49	mg s^{-1}
Antimony (Sb)	0.056	mg Nm^{-3}		2.79	mg s^{-1}
Lead (Pb)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Chromium (Cr)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Cobalt (Co)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Copper (Cu)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Manganese (Mn)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Nickel (Ni)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Vanadium (Vn)	0.056	mg Nm^{-3}	(d)	2.79	mg s^{-1}
Arsenic (As)	0.0007	mg Nm^{-3}	(e)	0.035	mg s^{-1}
Chromium (VI)	0.000035	mg Nm^{-3}	(e)	0.0017	mg s^{-1}
Dioxins & furans (I-TEQ)	0.1	ng Nm^{-3}		4.99	ng s^{-1}
PAHs	0.1	ng Nm^{-3}		4.99	ng s^{-1}
PCBs	0.0026	ng Nm^{-3}	(f)	0.13	ng s^{-1}

(a) Corrected for: Temperature; 273 K; Pressure; 101.3 kPa (1 atmosphere); dry; 11% v/v O_2.
(b) Conservatively assumes all PM_{10} is $PM_{2.5}$.
(c) Assumes that cadmium is 50% of the total of cadmium plus thallium (tl).
(d) The IED limit for nine metals is 0.5 mg Nm^{-3} this assessment assumes that these metals are no more than 1/9 of this limit.
(e) Environment Agency Guidance (September 2012); Mean measured concentration from 20 WID plants used.
(f) Environment Agency (30 April 2014) personal communication.

Measures will be incorporated into the design and operation of the facility to minimise the potential for emissions of odours. These measures will include fast acting doors to the waste handling facility with the doors normally closed during operation. Also, there will be an air handling unit ensuring adequate ventilation. Air from the waste handling building is released to atmosphere from a 40 m high stack.

Table 4.3 shows the emissions data used to model emissions of odour to atmosphere from the waste handling building.

Table 4.3 Emissions and Physical Properties, Ventilation Stack

Parameter	Value
Number of stacks	1
Number of flues	1
OS Grid Reference (m)	385682 152003
Release height above ground level (m)	40.0
Exhaust gas flow rate ($Am^3 hr^{-1}$)	120,000
Actual volumetric flow rate ($Am^3 s^{-1}$)	33.3
Flue diameter (m)	1.68
Exit velocity ($m s^{-1}$)	15.0
Flue gas emission temperature (deg C)	20
Odour Concentration ($OU_e m^{-3}$)	2,000
Odour emission rate ($OU_e s^{-1}$)	66,600
Bio-aerosol concentration ($cfu m^{-3}$)	1,000
Bio-aerosol emission rate ($cfu s^{-1}$)	33,300

4.3 RECEPTORS

To determine the maximum ground level concentrations occurring due to emissions to atmosphere from the proposed facility and the distribution of impacts, predictions are made of ground level concentrations for a grid of receptors. Concentrations for receptor R1 are relevant for the height of the intake but for simplicity, are all referred to as 'ground level concentrations' throughout this report. The receptor grid is 6,000 m by 5,000 m with spacing of 100 m. Making predictions for a grid of receptors also allows the predicted ground level concentrations to be presented as contour plots.

The specific receptors used in this assessment can be divided into three groups

- Monitoring locations, this allows for the predicted impacts to be directly compared and added to measured concentrations.
- Locations where there is relevant exposure such as residential properties.
- Statutory and non-statutory sites of ecological importance: The Environment Agency (EA) H1 guidance states that Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar Sites within 10 km together with Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), Local Nature Reserves (LNRs), Local Wildlife sites and ancient woodland within 2 km need to be considered.

For the purpose of Local Air Quality Management (LAQM) the Air Quality Strategy Objectives (AQS) only apply where there is relevant exposure. This is defined as being where members of the public are regularly present and are likely to be exposed for a period of time, appropriate to the averaging period of the objective. For the annual average objective, locations of relevant exposure include residential properties, schools and hospitals.

Table 4.4 presents details of the specific receptors included in the modelling which have been selected because of the potential for relevant exposure,

ecological importance. The air intake for the dairy has been included as a receptor to allow the potential for tainting to be assessed.

Table 4.4 Receptor Locations

No.	Description	Distance (km)	OS Grid Reference (m)
R1	Dairy, air intake	0.1	385617 152060
R2	Storridge Farm	0.8	385267 152609
R3	Brook Farm	1.6	385178 153494
R4	Court Farm	1.6	385915 153613
R5	Property on Hawkeridge Road	1.6	386134 153574
R6	Hawkeridge Farm	1.4	386442 153199
R7	Hawkeridge Park	0.6	386151 152405
R8	Hawkeridge Park	0.8	386367 152583
R9	Grenmore Farm	1.0	386477 152747
R10	Storridge Road	0.4	386022 152256
R11	Bramble Drive	1.3	387050 152190
R12	Oldfield Road	0.8	386370 151576
R13	Penleigh Farm	1.1	385625 150947
R14	Brook Lane	0.2	385905 152060
R15	Orchard House	0.3	385504 151808
R16	Brook Cottage	0.7	385029 151867
R17	Lambert's farm	1.2	384905 151214
R18	Dairy Farm	1.3	384524 151709
R19	Bremeridge Farm	1.5	384904 150785
R20	School	1.1	386506 151280
M1	P13/58 Primmers Place	0.7	386470 151928
M2	P13/51 41 Haynes Road	1.7	387240 151164
M3	P13/56 12 Fore Street	1.7	387369 151600
E1	Salisbury Plain SAC (Max)	4.2	389588 150300
E2	Salisbury Plain SAC (Representative)	7.3	392043 148353
E3	River Avon SAC	8.6	388191 143736
E4	Picket and Clanger Wood SSSI (Max)	2.4	387257 153817
E5	Picket and Clanger Wood SSSI (Representative)	2.9	387564 154240

Figure 4.1 shows the locations of the receptors, also shown is the location of the main stack.

Figure 4.1 Location of Human Heath Receptors and Stack (Blue Spot)

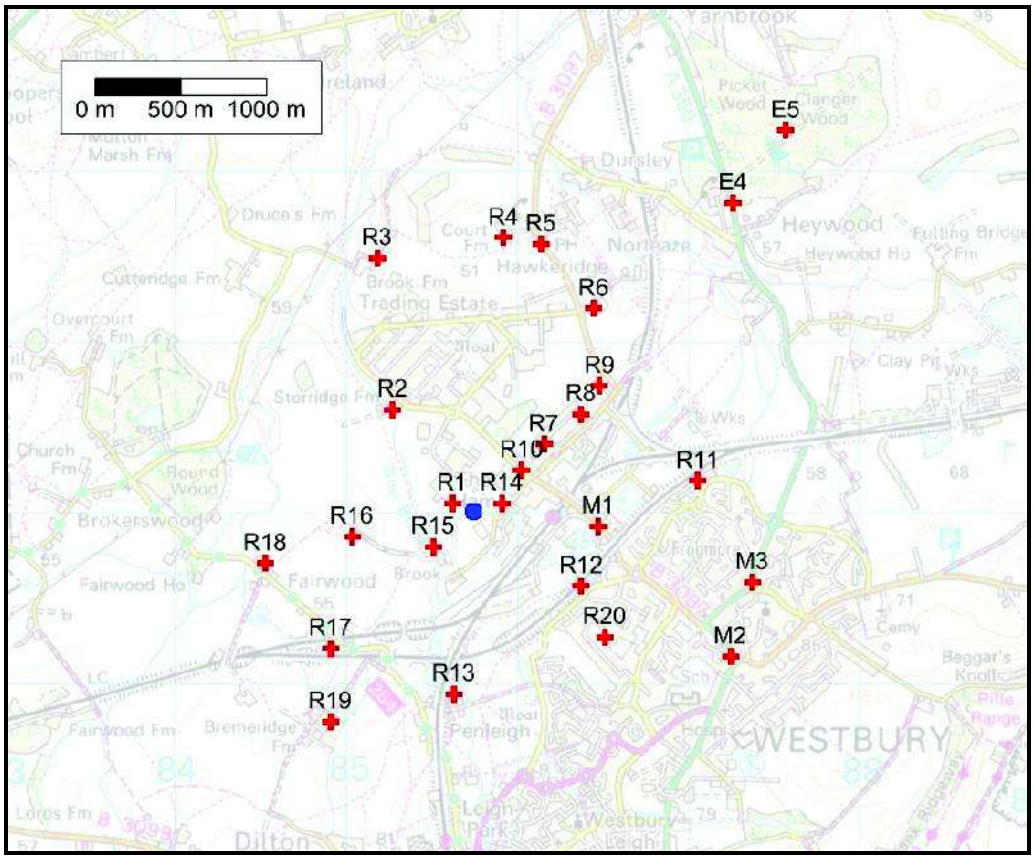
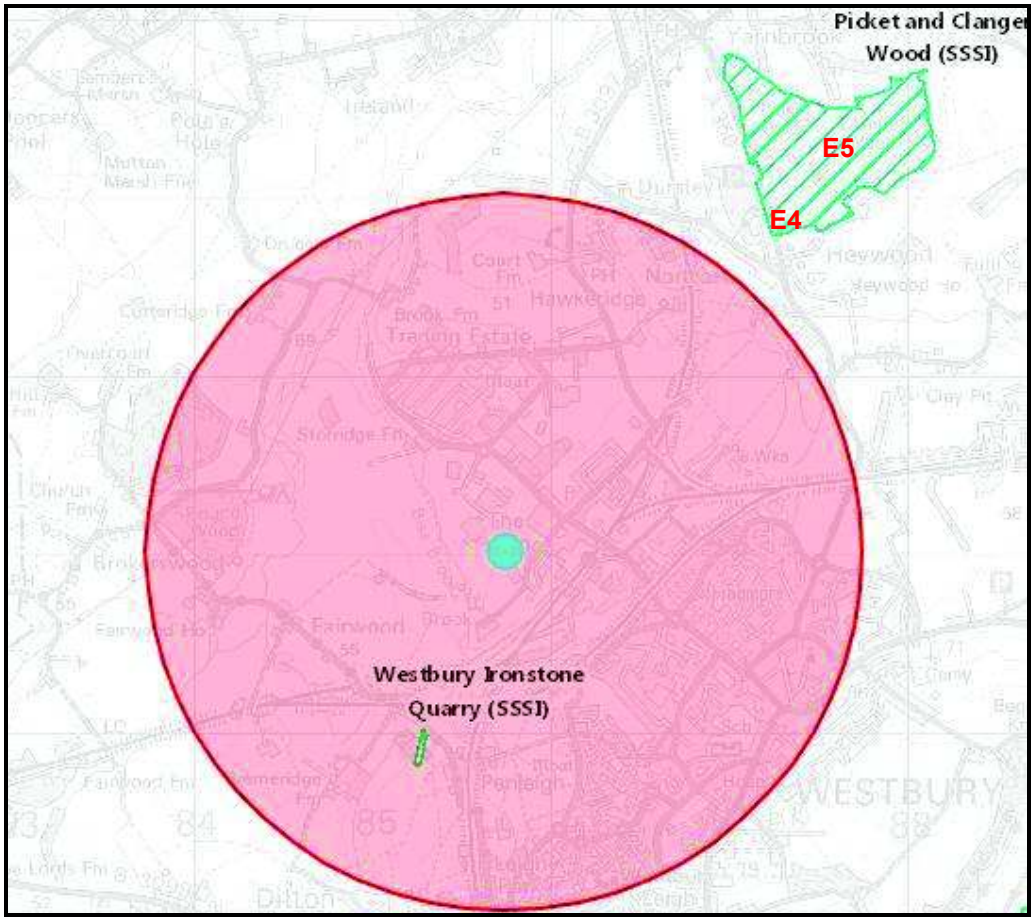


Figure 4.2 shows the location of statutory and non-statutory ecological sites within 2 km of the proposed facility used to assess the impacts of the proposed facility on vegetation and eco systems. Also shown are the receptor locations.

Figure 4.2 shows that there are no statutory or non-statutory ecological sites within 2 km. Given that 2 km is the screening distance detailed in the Environment Agency's H1 guidance it would be reasonable to disregard sites outside this distance (unless they are SAC, Ramsar or SPAs). However, given that the Picket and Clanger SSSI is located to the north east which is in the direction that the prevailing wind will transport emissions from the facility assessment of the impacts on this SSSI have been included in this assessment.

The Westbury Ironstone Quarry SSSI has been designated a SSSI for geological reasons and therefore is not relevant to this assessment.

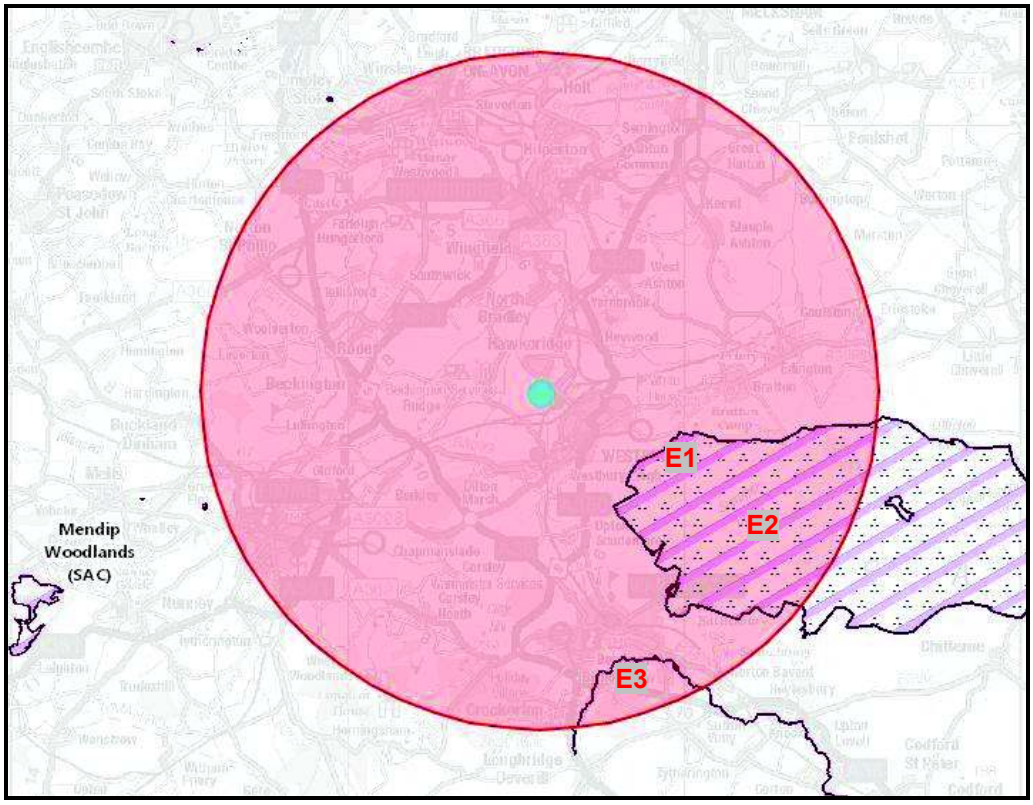
Figure 4.2 **Location of Proposed Facility and Statutory and Non Statutory Sites (Red Circle Radius is 2 km)**



Source: www.magic.defra.gov.uk

Figure 4.3 shows the location of statutory ecological sites within 10 km of the proposed facility used to assess the impacts of the proposed facility on vegetation and eco systems. Also shown are the receptor locations.

Figure 4.3 **Location of Proposed Facility and Statutory Sites (Red Circle Radius is 10 km)**



Source: www.magic.defra.gov.uk

4.4 FACTORS AFFECTING DISPERSION

There are a number of factors that will affect how emissions disperse once released to atmosphere. The four factors having the greatest effect on dispersion are:

- physical characteristics of the emissions
- climate
- terrain
- building downwash

4.4.1 PHYSICAL CHARACTERISTICS OF THE EMISSIONS

Provided that the exhaust gases have sufficient velocity at stack exit to overcome the effects of stack tip downwash, which is almost certainly the case for velocities of 15 m s^{-1} or more, the physical characteristics of the flue gases will determine the amount of plume rise and hence the effect on ground level pollutant concentrations. The degree of plume rise usually depends on the greater of the thermal buoyancy or momentum effects.

4.4.2 CLIMATE

The most important meteorological parameters governing the atmospheric dispersion of pollutants are wind speed, wind direction and atmospheric stability.

- **Wind direction** determines the broad transport of the plume and the sector of the compass into which the plume is dispersed.

- **Wind speed** can affect plume dispersion by increasing the initial dilution of pollutants and inhibiting plume rise.

- **Atmospheric stability** is a measure of the turbulence of the air, particularly of the vertical motions present. For dispersion modelling purposes, one method of classifying stability is by the use of Pasquill Stability categories, A to F. Another is by reference to the surface heat flux present at the ground.

Dispersion models, such as ADMS and AERMOD, do not allocate the degree of atmospheric turbulence into six discrete categories. These models use a parameter known as the Monin-Obukhov length which, together with the wind speed, describes the stability of the atmosphere.

4.4.3 BUILDING DOWNWASH

The presence of buildings can significantly affect the dispersion of the atmospheric emissions. Wind blowing around a building distorts the flow and creates zones of turbulence that are greater than if the building were absent. Increased turbulence causes greater plume mixing; the rise and trajectory of the plume may be depressed generally by the flow distortion. For elevated releases such as those from stacks, building downwash leads to higher ground level concentrations closer to the stack than those present if a building was not there. The effects of building down wash are usually only significant where the buildings are more than 40% of the stack height.

Table 4.5 shows the dimensions of the buildings included in the modelling. The buildings of the proposed waste transfer station will not affect dispersion and have not been included.

Table 4.5 Dimensions of Buildings Included in the Modelling

Building	Centre (m)		Height (m) [(a)]	Length (m)	Width (m)	Angle (deg) [(b)]
1	385706	152024	37.8	39.4	36.9	57
2	385731	152044	26.1	24.9	29.4	57
3	385714	152064	21.5	31.4	21.5	57
4	385689	152044	16.0	32.3	14.9	57
5	385681	152017	35.1	9.1	51.8	57
6	385657	151985	30.1	27.4	62.0	57
7	385590	152110	40 [(c)]	50	25	43

(a) Height above ground level.
(b) Angle building length makes to north.
(c) Approximate height of highest building of the dairy.

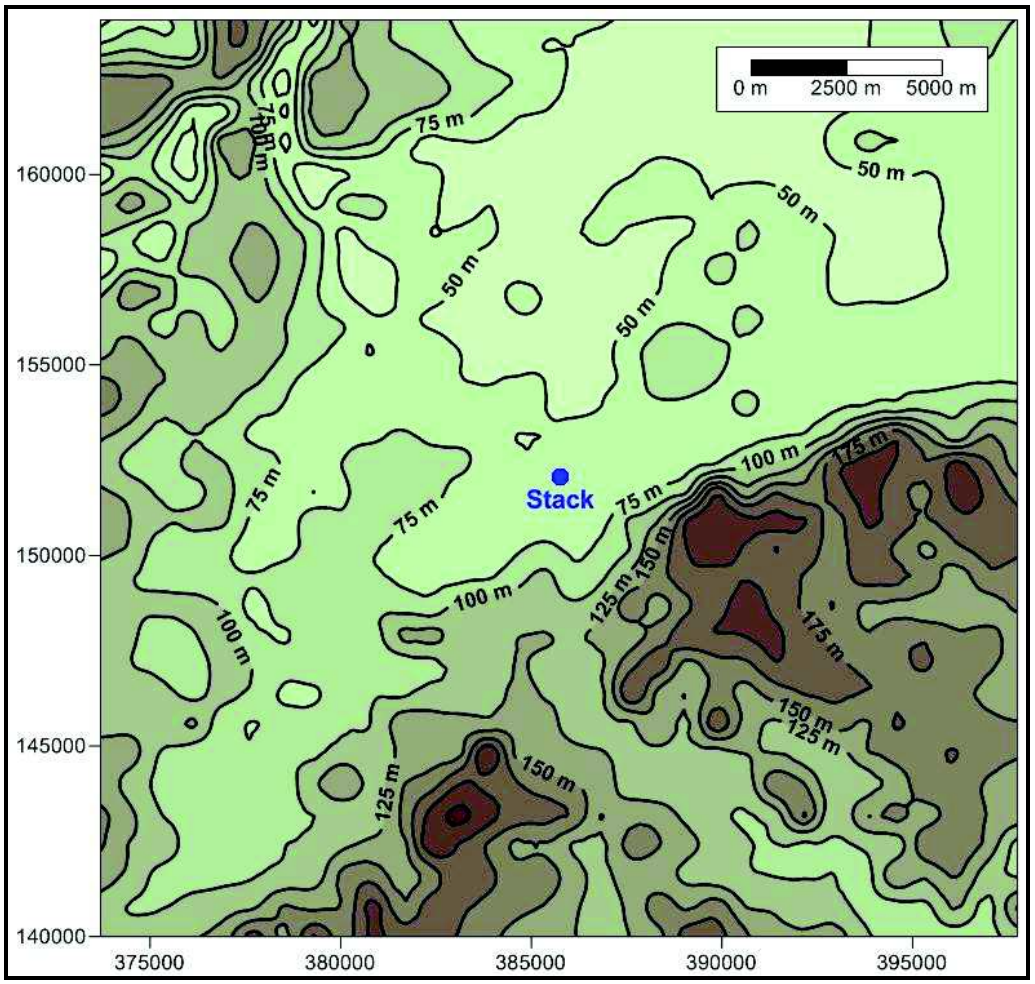
The sensitivity of model predicted concentrations to the effects of building downwash are presented in **Section 7.**

4.4.4 NATURE OF THE SURFACE

Terrain

The effects of elevated terrain can affect dispersion. **Figure 4.4** shows the terrain elevations that have been included in the modelling.

Figure 4.4 Terrain Elevations in Region of the Proposed Facility



The sensitivity of model predicted concentrations to the inclusion of terrain effects is presented in **Section 7**.

Roughness

The nature of the surface can have a significant influence on dispersion by affecting the vertical velocity profile (ie the rate of increase in wind speed for increasing heights above ground level). Also affected is the amount of atmospheric turbulence. To account for the surrounding nature of the proposed site, a surface roughness length of 0.3 m has been assumed for the dispersion modelling. It is assumed that this roughness length is also representative of Lyneham which is the source of the meteorological data. The sensitivity of model predicted concentrations to roughness length are presented in **Section 7**.

4.4.5 PLUME GROUNDING

Plume grounding is usually the description given when a plume can be observed to impact on the ground or elevated terrain. Plumes are usually only visible if they contain smoke, which is not the case here, or if water vapour in the plume has condensed to form a visible vapour plume.

Whether visible or not, all plumes will ground; the dispersion model used for this assessment calculates the frequency and intensity of plume grounding events to predict the resulting ground level concentrations.

The assessment of the frequency of visibility vapour plumes presented in **Section 5.6** shows that visible vapour plumes longer than 100 m will only occur for 0.5% of the year and therefore the frequency of visible plume grounding events will be significantly less that 0.5% for locations more than 100 m from the proposed facility. It should be noted that for the majority of the time when a plume is visible (eg 0.5% for plumes more than 100 m) the visible part of plume will not be coming to ground and therefore there will not be a visible plume grounding event.

4.5 SELECTION OF SUITABLE DISPERSION MODEL

The dispersion models which are widely used to predict ground level pollutant concentrations are based on the concept of the time averaged lateral and vertical concentration of pollutants in a plume being characterised by a Gaussian (1) distribution and the atmosphere is characterised by a number of discrete stability classes. So-called ‘ new generation' dispersion models have been developed which replace the description of the atmospheric boundary layer as being composed of discrete stability classes with an infinitely variable measure of the surface heat flux, which in turn influences the turbulent structure of the atmosphere and hence the dispersion of a plume.

(1) A Gaussian distribution has the appearance of a bell-shaped curve. The maximum concentration occurs on the centre line.

There are two commercially available dispersion models that are able to predict ground level concentrations arising from emissions to atmosphere from elevated point sources (ie stacks), and are described by the Environment Agency (EA) as being ' new generation'.

- AERMOD: The US **A**merican Meteorological Society and **E**nvironmental Protection Agency **R**egulatory Model Improvement Committee developed the dispersion **MOD**del called AERMOD which incorporates the latest understanding of the atmospheric boundary layer.

- Atmospheric Dispersion Modelling System (ADMS): This dispersion model was developed by the UK consultancy CERC. The model allows for the skewed nature of turbulence within the atmospheric boundary layer.

In many respects the models are quite similar and in some situations, generate similar predictions of ground level concentrations. Two intercomparison studies commissioned by the Environment Agency however found there to be significant differences in calculated concentrations between the models [(1)]. These reports highlight modelling uncertainties and do not suggest that any one of the models is considered to be the most accurate.

ADMS 5.2 was selected as the model for use in this assessment because it has been extensively used for assessment work of this nature.

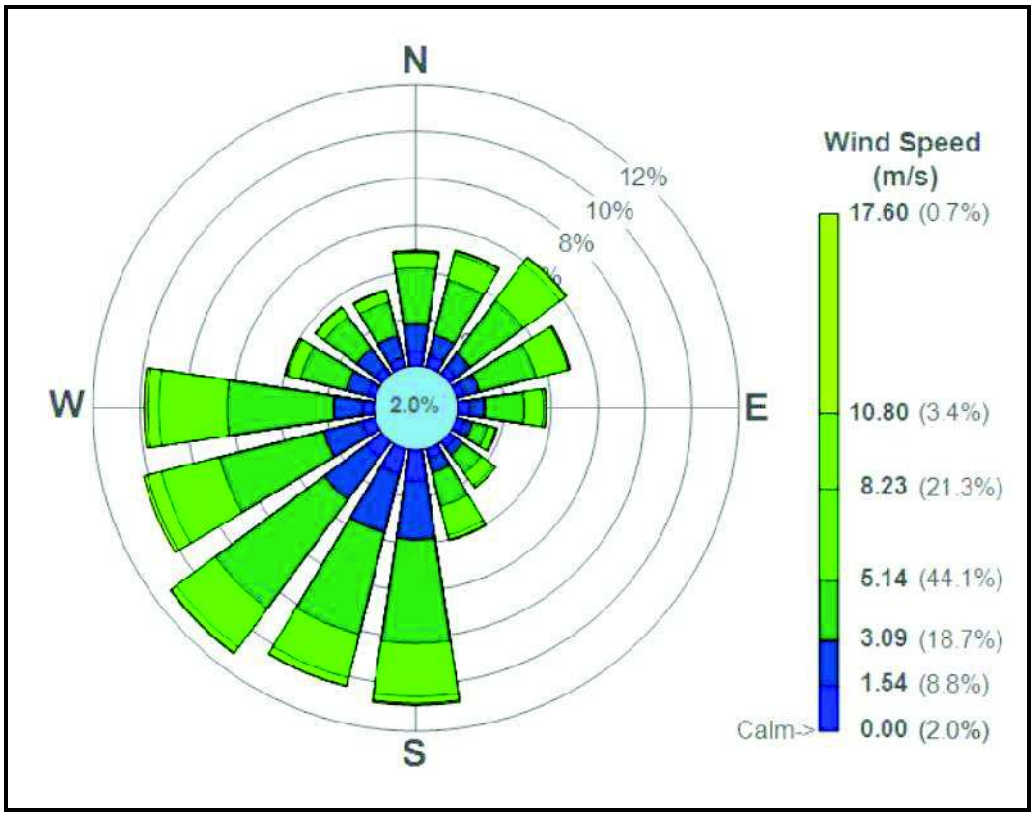
4.6 METEOROLOGICAL DATA

An important input to the dispersion model is the meteorological data. These data are important in determining the location of the maximum concentrations and their magnitude.

The closest observing station where data is available is RAF Lyneham which is 30 km away. Five years of hourly meteorological data for 2012-2016 have been used in this assessment. **Figure 4.5** shows the windrose for RAF Lyneham for 2012-2016, used in this assessment, which shows that the prevailing wind is from the south west, which will transport emissions to the north east.

(1) R&D Technical Report P353: **A review of dispersion model intercomparison studies using ISC, R91, AERMOD and ADMS** (ISBN 1 85705 276 5) and R&D Technical Report P362: An intercomparison of the AERMOD, ADMS and ISC dispersion models for regulatory applications (ISBN 1 85705 340 0).

Figure 4.5 Wind Rose RAF Lyneham (2012-2016)



4.7 PERCENTAGE OXIDATION OF NITRIC OXIDE (NO) TO NITROGEN DIOXIDE (NO_2)

Oxides of nitrogen (NO_x) emitted to atmosphere as a result of gas combustion will consist largely of nitric oxide (NO), a relatively innocuous substance. Once released into the atmosphere, nitric oxide is oxidised to nitrogen dioxide (NO_2), which is of concern with respect to health and other impacts. The proportion of nitric oxide oxidised to nitrogen dioxide depends on a number of factors and the oxidation is limited by the availability of oxidants, such as ozone (O_3).

An oxidation of 35% has been assumed for oxidation of nitric oxide (NO) to nitrogen dioxide (NO_2) for short-term concentrations. For predictions of annual averages, it is assumed that 70% of the oxides of nitrogen (NO_x) are in the form of nitrogen dioxide (NO_2). These assumptions are recommended by the Environment Agency (EA) [(1)].

(1) Environment Agency (AQMAU): Conversion Ratios for NO_x and NO_2.

5 PREDICTIONS AND ASSESSMENT OF IMPACTS ON HUMAN HEALTH

5.1 INTRODUCTION

This section presents the incremental increase in ground level concentrations predicted to occur as a consequence of emissions to atmosphere from the operation of the proposed facility. Predictions are presented, and assessment made of the routine emissions to atmosphere assuming that the facility is operating continuously at full load.

The focus of the assessment is on impacts of nitrogen dioxide (NO_2) as this is the pollutant of most concern both in terms of the existing prevailing concentration and the incremental impacts from the proposed facility.

This section also presents an assessment of the impacts of all the pollutants released to atmosphere from the proposed facility as well as predictions of the potential for emissions of odour to cause annoyance and bio-aerosols to affect the dairy.

Also considered are impacts during construction.

5.2 IMPACTS DURING CONSTRUCTION

No demolition or site clearance is required for the proposed development.

The impacts on air quality along the routes that will be used by construction traffic will be negligible as the number of movements will not exceed the EPUK threshold for requiring an assessment, which is an increase of more than 200 HDV movements per day of a 5% increase in traffic through an AQMA. Construction vehicle traffic movements will therefore have no impact on the Air AQMA.

The closest residential properties to the proposed development are Brookfield and Crosslands off Brook Lane approximately 75 m to the east of the site. There is also the dairy immediately to the north of the site.

The Institute of Air Quality Management (IAQM) published guidance on how to assess impacts of emissions of dust from demolition and construction sites (1). This guidance has been followed in **Table 5.1** which shows the steps undertaken to determine the risk of dust from construction giving rise to annoyance.

(1) IAQM (February 2014) Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance.

Table 5.1 IAQM Dust Risk Assessment Methodology

Step	Outcome
Step 1: Need for Detailed Assessment	Assessment required due to proximity of sensitive receptors within 350 m.
Step 2: Assess the Risk of Dust Effect	Low risk site due to receptors because on the small number of receptors.
Step 3: Identify the Need for Site-Specific Mitigation	The IAQM guidance stipulates that for Low Risk sites the Low Risk mitigation measures are appropriate. The guidance however states that professional judgement should be employed. Given the close proximity of the air intakes to the dairy it is considered that Medium Risk mitigation measures should be followed. These are detailed in the IAQM guidance
Step 4: Define Effects and their Significance	Low impact (following mitigation)

Following the implementation of appropriate mitigation measures the significance of the impacts is considered to be low.

The effect on air quality of emissions to atmosphere from construction vehicles will be negligible.

5.3 EMISSIONS FROM VEHICLES

Currently, Solid Recovered Fuel (SRF) from Northacre Resource Recovery Centre destined for Germany passes through the Westbury AQMA resulting in 718 trips per year; these movements will cease on the opening of the proposed development. Waste material imports to the proposed development will result in 2,343 trips per year through the Westbury AQMA, therefore the net change in HGV traffic is an additional 1,625 trips per year. On the basis of 7,500 hours operation per year this equates to no more than an additional 6 HGV movements per days through the Westbury AQMA.

Emissions to atmosphere from 6 HGV movements per day will have a negligible impact on air quality as the numbers of HGVs are significantly below the EPUK/IAQM threshold for requiring an assessment which is 100 HGV movements per day. The additional 6 HGVs movements can also be put into context by comparison to the current annual average daily traffic (AADT) of 17,310 which passes through the AQMA (1). The extra HGVs represent a negligible increase in the AADT of 0.03%.

The effect of emissions to atmosphere from vehicles during operation has therefore not been considered further.

5.4 EMISSIONS FROM THE MAIN STACK

The assessment is undertaken for continuous full load emissions. It should be noted that the installation is expected to operate for 7,500 hours per year so all predicted annual average concentrations are conservative.

(1) AMEC (September 2014) Land North of Bitham Park, Westbury, Air Quality Assessment.

5.4.1 NITROGEN DIOXIDE (NO_2)

The principal pollutant released to atmosphere from the proposed facility is the oxides of nitrogen (NO_x) which will progressively oxidise to nitrogen dioxide (NO_2) in the atmosphere. **Table 5.2** shows the maximum predicted ground level concentration of nitrogen dioxide (NO_2) occurring as a consequence of emissions to atmosphere from the facility for each of the five years of meteorological data. The predictions include the effects of terrain and building downwash.

Table 5.2 ADMS 5.2 Maximum Predicted (Process Contribution) Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3}) [(a)]

Year	Annual Average	99.8th Percentile of Hourly Averages
2012	1.03	8.0
2013	0.74	7.7
2014	0.83	10.1
2015	0.94	8.4
2016	0.64	8.5
Background Concentration	9.9 [(b)]	-
Background + Maximum Impact (PEC) [(c)]	10.9	29.9 [(d)]
Assessment Criteria	**40**	**200**

(a) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.
(b) Defra estimate background concentration, appropriate for point of maximum impact.
(c) Predicted Environmental Concentration.
(d) Environment Agency (H1) guidance; 99.8th + 2 x annual average background.

For determining the total annual average concentration, it is correct to add the predicted increment to the prevailing background. This is not the case for the 99.8th percentile.

The Environment Agency's H1 Technical Guidance also states:

$$PEC_{short\ term} = PC_{short\ term} + (2 \times Background_{long\ term})$$

where PC is the Process Contribution and PEC is the Predicted Environmental Concentration.

Table 5.2 shows that 2012 meteorological data gives rise to the highest predicted increment to annual average ground level concentrations and 2014 is the highest 99.8th percentile of hourly averages.

For 2012 meteorological data, at the point of maximum predicted impact, the incremental increase in annual average ground level concentration is 1.03 µg m^{-3} which can be compared to the air quality strategy objective of 40 µg m^{-3}. When added to the prevailing background concentration of 9.9 µg m^{-3}, the resulting total concentration of 10.9 µg m^{-3} is less than the Air Quality Strategy (AQS) objective.

The maximum predicted 99.8th percentile of 10.1 µg m^{-3} is small compared to the Air Quality Strategy (AQS) objective of 200 µg m^{-3}. To determine the incremental increase to background occurring due to the proposed facility, the H1 guidance is used. The resulting total 99.8th percentile is 29.9 µg m^{-3}.

Table 5.3 shows the predicted annual average concentration at the specific receptors for human exposure and at the monitoring locations using 2012 meteorological data.

Table 5.3 ADMS 5.2 Predicted Annual Average Concentrations of Nitrogen Dioxide (NO_2) at Specific Receptors, 2012 Meteorological Data (NO_2, µg m^{-3}) [(a)]

No.	Description	Predicted Increment (Process Cont., PC)	Prevailing Conc.	Predicted Increment + Prevailing (Predicted Environmental Conc. PEC)	Increment (PC) as Percentage of Objective (%)
R1	Dairy, air intake	0.0	9.9	9.9	0.0%
R2	Storridge Farm	0.1	9.9	10.0	0.3%
R3	Brook Farm	0.1	9.9	10.0	0.3%
R4	Court Farm	0.2	9.9	10.1	0.6%
R5	Hawkeridge Road	0.3	9.9	10.2	0.6%
R6	Hawkeridge Farm	0.5	9.9	10.4	1.2%
R7	Hawkeridge Park	0.8	9.9	10.7	2.0%
R8	Hawkeridge Park	0.9	9.9	10.8	2.2%
R9	Grenmore Farm	0.8	9.9	10.7	1.9%
R10	Storridge Road	0.3	9.9	10.2	0.7%
R11	Bramble Drive	0.3	9.9	10.2	0.7%
R12	Oldfield Road	0.2	9.9	10.1	0.5%
R13	Penleigh Farm	0.2	9.9	10.1	0.4%
R14	Brook Lane	0.0	9.9	9.9	0.0%
R15	Orchard House	0.1	9.9	10.0	0.3%
R16	Brook Cottage	0.2	9.9	10.1	0.4%
R17	Lambert's farm	0.3	9.9	10.2	0.7%
R18	Dairy Farm	0.1	9.9	10.0	0.3%
R19	Bremeridge Farm	0.2	9.9	10.1	0.5%
R20	School	0.2	9.9	10.1	0.4%
M1	58 - Primmers	0.2	28 [(b)]	28.2	0.6%
M2	51 - 41 Haynes	0.1	38 [(b)]	38.1	0.3%
M3	56 - 12 Fore St	0.1	39 [(b)]	39.1	0.3%
Assessment Criteria			**40**		

(a) Assumes 70% oxidation.
(b) Measured values.

The EPUK significance criteria are applicable to locations where there is relevant exposure and are only applicable to annual average concentration. Defra TG16) guidance gives the following examples of where there is relevant exposure to annual average objectives

- Building facades of residential properties
- School
- Hospital
- Care homes

Examples given of where there is not relevant exposure to annual average objectives include; gardens of residential properties, hotels and kerbside sites.

Table 5.4 shows the EPUK significance criteria.

Table 5.4 EPUK Significance Criteria; Nitrogen Dioxide (NO_2, µg m^{-3})

No.	Description	Predicted Increment (PC)	Increase %age of Objective (%)	Back ground	PEC	PEC %age of Objective	Impact Descriptor
R1	Dairy, air intake	0.0	0%	9.9	9.9	24.8%	Negligible
R2	Storridge Farm	0.1	0%	9.9	10.0	25.0%	Negligible
R3	Brook Farm	0.1	0%	9.9	10.0	25.1%	Negligible
R4	Court Farm	0.2	1%	9.9	10.1	25.3%	Negligible
R5	Hawkeridge Road	0.3	1%	9.9	10.2	25.4%	Negligible
R6	Hawkeridge Farm	0.5	1%	9.9	10.4	26.0%	Negligible
R7	Hawkeridge Park	0.8	2%	9.9	10.7	26.7%	Negligible
R8	Hawkeridge Park	0.9	2%	9.9	10.8	27.0%	Negligible
R9	Grenmore Farm	0.8	2%	9.9	10.7	26.7%	Negligible
R10	Storridge Road	0.3	1%	9.9	10.2	25.4%	Negligible
R11	Bramble Drive	0.3	1%	9.9	10.2	25.5%	Negligible
R12	Oldfield Road	0.2	0%	9.9	10.1	25.2%	Negligible
R13	Penleigh Farm	0.2	0%	9.9	10.1	25.1%	Negligible
R14	Brook Lane	0.0	0%	9.9	9.9	24.8%	Negligible
R15	Orchard House	0.1	0%	9.9	10.0	25.0%	Negligible
R16	Brook Cottage	0.2	0%	9.9	10.1	25.2%	Negligible
R17	Lambert's farm	0.3	1%	9.9	10.2	25.5%	Negligible
R18	Dairy Farm	0.1	0%	9.9	10.0	25.1%	Negligible
R19	Bremeridge Farm	0.2	1%	9.9	10.1	25.3%	Negligible
R20	School	0.2	0%	9.9	10.1	25.2%	Negligible
M1	58 - Primmers	0.2	1%	28	28.2	70.6%	Negligible
M2	51 - 41 Haynes	0.1	0%	38	38.1	95.3%	Negligible
M3	56 - 12 Fore St	0.1	0%	39	39.1	97.8%	Negligible

Table 5.4 shows that the impact description is 'negligible' at all the receptor locations. This includes the receptors M1 M2 and M3 which are in the Air Quality Management Area (AQMA).

Table 5.5 shows the predicted 99.8th percentile concentration at the specific receptors using 2014 meteorological data.

Table 5.5 ADMS 5.2 Predicted 99.8th Percentile Concentrations of Nitrogen Dioxide (NO_2) at Specific Receptors, 2014 Meteorological Data (NO_2, µg m^{-3}) [(a)]

No.	Description	Predicted Increment (PC)	Predicted Increment + Prevailing (PEC)[(b)]	Increment as Percentage of Objective (%)
R1	Dairy, air intake	0.1	19.9	0.0%
R2	Storridge Farm	4.0	24.0	2.0%
R3	Brook Farm	3.0	23.1	1.5%
R4	Court Farm	3.0	23.2	1.5%
R5	Hawkeridge Road	3.0	23.3	1.5%
R6	Hawkeridge Farm	3.7	24.6	1.8%
R7	Hawkeridge Park	7.6	29.2	3.8%
R8	Hawkeridge Park	6.5	28.2	3.2%
R9	Grenmore Farm	5.4	26.9	2.7%
R10	Storridge Road	5.0	25.5	2.5%
R11	Bramble Drive	3.5	24.0	1.8%
R12	Oldfield Road	5.6	25.7	2.8%
R13	Penleigh Farm	3.7	23.7	1.8%
R14	Brook Lane	0.2	20.0	0.1%
R15	Orchard House	3.9	23.9	1.9%
R16	Brook Cottage	5.1	25.3	2.6%
R17	Lambert's farm	4.1	24.5	2.1%
R18	Dairy Farm	3.5	23.6	1.8%
R19	Bremeridge Farm	3.0	23.3	1.5%
R20	School	4.1	24.1	2.0%
M1	58 - Primmers	6.0	62.5	3.0%
M2	51 - 41 Haynes	2.5	78.7	1.3%
M3	56 - 12 Fore St	2.8	81.1	1.4%
	Assessment Criteria		**200**	

(a) Assumes 35% oxidation.
(b) Defra guidance (TG4(00)); NO_2 99.8th + 2 x annual average NO_2 background.

Table 5.5 shows that the maximum predicted 99.8th percentile of hourly average nitrogen dioxide (NO_2) concentrations is 7.6 µg m^{-3} at any of the specific receptors which is only 3.8% of the objective. It is not appropriate to use the EPUK significance criteria on short term concentrations of nitrogen dioxide (NO_2).

The short term impacts can be screened out as being insignificant using the Environment Agency's H1 guidance of 10%.

Tables 5.2 to 5.5 show that at the specific receptors, the predicted incremental increase in concentrations of nitrogen dioxide (NO_2) occurring due to emissions from the proposed facility are small compared to the assessment criteria and are not of concern to human health.

The following figures are presented to illustrate the distribution of concentrations of the nitrogen dioxide (NO_2). Predictions are presented for 2012 and 2014 meteorological data and are the Process Contributions (PC).

- **Figure 5.1;** Annual Average
- **Figure 5.2**; 99.8th percentile of hourly averages

The figures show that peak predicted increments to ground level concentrations occur within about 750 m of the facility.

Figure 5.1 ADMS 5.2 Predicted Annual Average Ground Level Concentrations of the Nitrogen Dioxide (NO_2); 2012 Meteorological Data (µg m^{-3}); Assuming 70% Oxidation

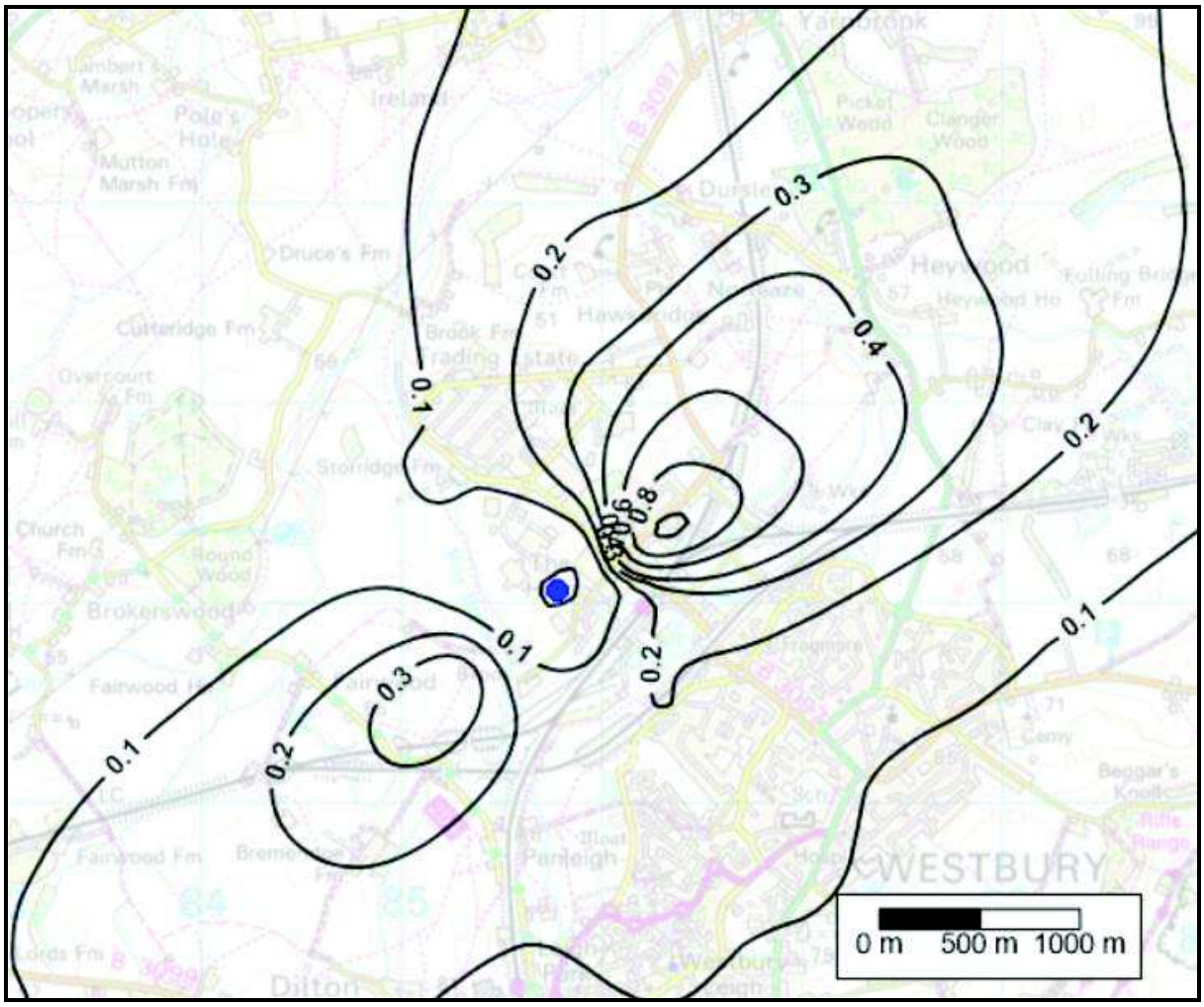
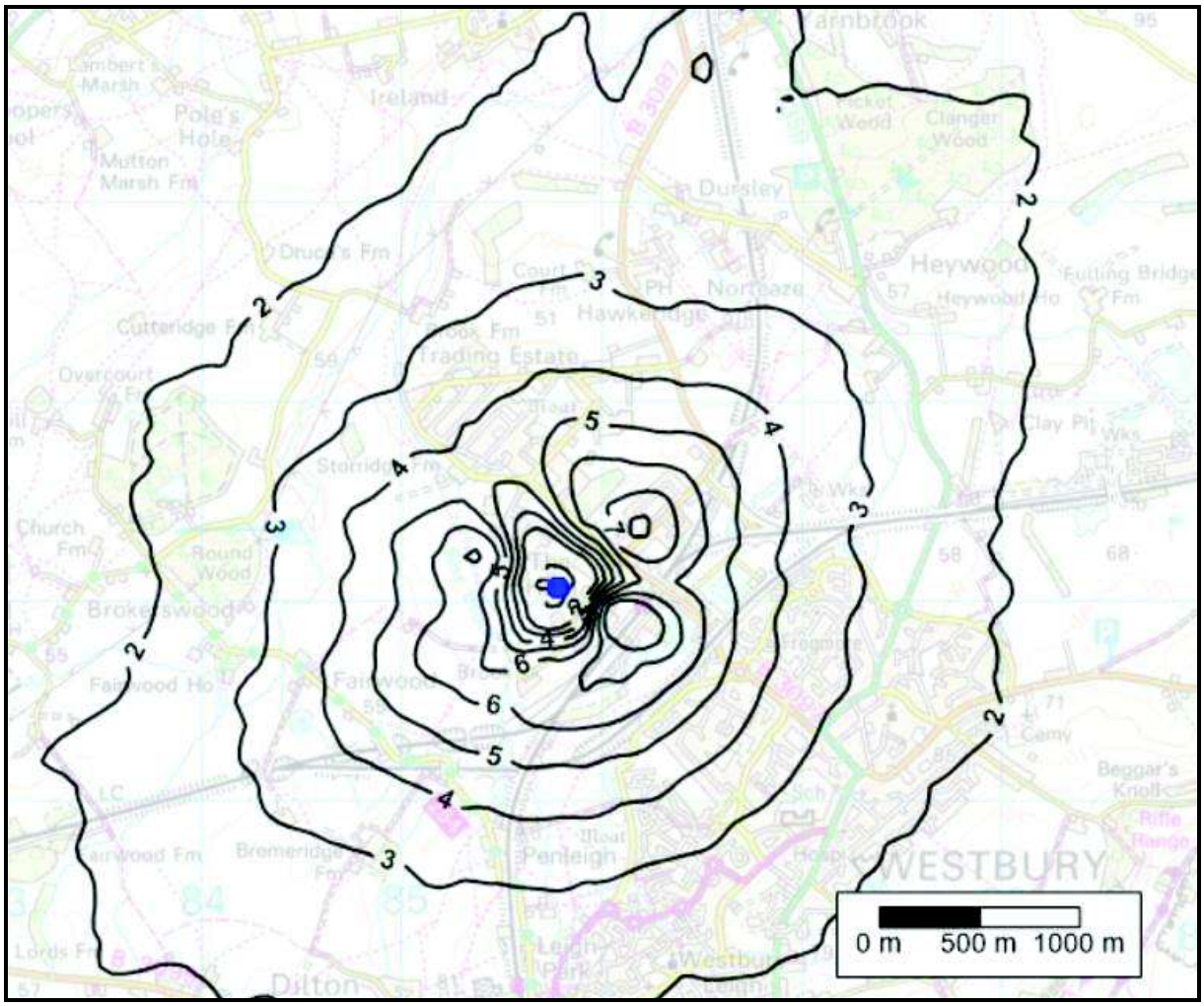


Figure 5.2 ADMS 5.2 Predicted 99.8th Percentile of Hourly Average Ground Level Concentrations of Nitrogen Dioxide (NO_2); 2014 Meteorological (µg m^{-3}); Assuming 35% Oxidation



5.4.2 REMAINING POLLUTANTS

The assessment of nitrogen dioxide (NO_2) and the remaining pollutants assumes full load continuous operation at the IED limits. The assessment uses 2012 meteorological data because this gives rise to the largest increment to annual average concentrations. The distribution of all the predicted ground level pollutant concentrations will be the same as those for nitrogen dioxide (NO_2) and therefore have not been presented.

Table 5.6 shows the maximum predicted increments to ground level concentrations (Process Contribution, PC) using emission data which are in the most part the emission limits. Also shown are the estimates of background concentrations and the Predicted Environmental Concentration (PEC).

Table 5.6 ADMS 5.2 Maximum Predicted Incremental Concentrations due to Emissions to Atmosphere (µg m^{-3}, 2012 Meteorological Data)

Pollutant	Averaging Period	Allowable Number of Exceedence	PC (µg m^{-3})	Background (µg m^{-3})	PEC (µg m^{-3})	Assessment Criteria (µg m^{-3})	Percentage of Assessment Criteria (%)	PEC as Percentage Assessment Criteria
Nitrogen dioxide (NO_2)	1 hour	18	8.0	-	27.8	200	4.0%	13.9%
	Annual	-	1.03	9.9	10.9	40	2.6%	27.3%
Particulate matter (PM_{10})	24 hour	35	0.25	-	8.2	50	0.5%	16.5%
	Annual	-	0.07	12.8	12.9	40	0.2%	32.2%
$PM_{2.5}$	Annul	-	0.07	8.3	8.4	20	0.4%	42.0%
Sulphur dioxide (SO_2)	15 Min	35	6.5	-	11.7	266	2.4%	4.4%
	1 hour	24	5.5	-	10.7	350	1.6%	3.1%
	24 hour	3	2.7	-	7.9	125	2.2%	6.4%
Carbon monoxide (CO)	8 Hour	-	5.3	-	605	10,000	0.1%	6.1%
Hydrogen chloride (HCl)	1 Hour	-	3.0	-	3.1	750	0.4%	0.4%
Hydrogen fluoride (HF)	Annual	-	0.007	0.003	0.010	16	0.0%	0.1%
	1 Hour	-	0.30	-	6.3	160	0.2%	3.9%
Benzene (C_6H_6)	Annual	-	0.007	0.2	0.21	5.0	0.1%	4.1%
	1 Hour		0.30	-	3.1	195	0.2%	0.4%
Ammonia (NH_3)	Annual	-	0.073	1.9	1.97	180	0.0%	1.1%
	1 Hour	-	2.95	-	6.8	2,500	0.1%	0.3%
Antimony (Sb)	Annual	-	0.0004	0.0008	0.0012	5	0.0%	0.0%
	1 Hour	-	0.017	-	0.018	150	0.0%	0.0%
Arsenic (As)	Annual	-	0.000005	0.00061	0.00062	0.003	0.2%	20.5%
Cadmium (Cd)	Annual	-	0.00018	0.00010	0.00028	0.005	3.7%	5.6%
Chromium (Cr)	Annual	-	0.0004	0.0010	0.0014	5	0.0%	0.0%
	1 Hour	-	0.017	-	0.018	150	0.0%	0.0%
Chromium (Cr, VI)	Annual	-	0.0000003	0.00019	0.00019	0.0002	0.1%	95.1%
Cobalt (Co)	Annual	-	0.0004	0.0001	0.0005	0.2	0.2%	0.2%
Copper (Cu)	Annual	-	0.0004	0.0027	0.0031	10	0.0%	0.0%
	1 Hour	-	0.017	-	0.022	200	0.0%	0.0%
Lead (Pb)	Annual	-	0.0004	0.0047	0.0051	0.25	0.2%	2.0%
Manganese (Mn)	Annual	-	0.0004	0.0022	0.0026	150	0.0%	0.0%
	1 Hour	-	0.017	-	0.021	1,500	0.0%	0.0%
Mercury (Hg)	Annual	-	0.0004	0.0011	0.0015	0.25	0.1%	0.6%
	1 Hour	-	0.015	-	0.017	7.5	0.2%	0.2%
Nickel (Ni)	Annual	-	0.0004	0.0008	0.0012	0.02	2.1%	5.9%
Vanadium (Vn)	Annual	-	0.0004	0.0009	0.0013	5	0.0%	0.0%
	1 Hour	-	0.017	-	0.018	1	1.7%	1.8%
Dioxins	Annual	-	0.73 [(a)]	16.80	17.5	-	-	-
PAHs	Annual	-	0.73 [(a)]	-	-	0.00025	0.0%	-
PCB	Annual	-	0.02 [(a)]	-	-	0.2	0.0%	-
	1 Hour	-	0.77 [(a)]	-	-	6	0.0%	-

(a) Units are fg m^{-3} ($x10^{-15}$).

Table 5.6 shows that, as a percentage of the short term assessment criteria, it is the 99.8th percentile of hourly average concentration of nitrogen dioxide (NO_2) which is 4.0% of the assessment criteria that has the largest impact. When combined with the background concentration the PEC (Predicted Environmental Concentration) of 27.8 µg m^{-3} is 13.90% of the assessment criteria and not considered to be of concern to human health.

For annual average impacts the increment to annual average concentration of cadmium (Cd) is predicted to give rise to the largest percentage of the assessment criteria of 3.7%. It should be noted that the assessment criteria of 0.005 µg m^{-3} is from the World Health Organisation Air Quality guidelines (2000) which state that the guideline is set to 'prevent any further increase of cadmium in agricultural soils'. Given that the maximum predicted concentration is substantially less than the assessment criteria and that the location of maximum impact is predominantly urban, it is considered that there is no concern to human health.

Dioxins and furans are a group of organic compounds that are formed as a result of incomplete combustion in the presence of chlorine. Sources include vehicles, domestic and industrial coal burning, power generation and incinerators. There are no regulatory air quality standards set for dioxins and furans. The maximum predicted ground level concentration of dioxin of 0.73 fg I-TEQ m^{-3} is small compared to the prevailing dioxin concentration and not of concern to human health as demonstrated by the health risk assessment (1).

5.5 ODOUR AND BIO-AEROSOLS IMPACTS FROM VENTILATION STACK

5.5.1 ODOURS

Table 5.7 shows the ADMS 5.2 predicted 98th percentile of hourly average odour concentrations at receptors.

(1) ADM Ltd (February 2018) Appendix A: Health Risk Assessment of Emissions to Atmosphere from Northacre Renewable Energy Westbury.

Table 5.7 ADMS 5.2 Prediction of 98th Percentile of Hourly Average Odour Concentrations ($OU_e\ m^{-3}$)

No.	Description	Predicted Odour Concentration for each Year of Met Data					Receptor Sensitivity [(a)]	Magnitude of Impact
		2012	2013	2014	2015	2016		
R1	Dairy, air intake	0.07	0.10	0.09	0.02	0.02	-	-
R2	Storridge Farm	0.2	0.2	0.2	0.2	0.2	High	Negligible
R3	Brook Farm	0.1	0.1	0.1	0.1	0.1	High	Negligible
R4	Court Farm	0.1	0.1	0.2	0.1	0.1	High	Negligible
R5	Hawkeridge Road	0.2	0.1	0.2	0.2	0.1	High	Negligible
R6	Hawkeridge Farm	0.2	0.2	0.2	0.2	0.2	High	Negligible
R7	Hawkeridge Park	0.5	0.4	0.5	0.5	0.5	High	Slight
R8	Hawkeridge Park	0.3	0.3	0.3	0.4	0.4	High	Negligible
R9	Grenmore Farm	0.2	0.2	0.3	0.3	0.3	High	Negligible
R10	Storridge Road	0.7	0.7	0.7	0.8	0.8	High	Slight
R11	Bramble Drive	0.1	0.1	0.1	0.1	0.1	High	Negligible
R12	Oldfield Road	0.2	0.2	0.2	0.2	0.2	High	Negligible
R13	Penleigh Farm	0.1	0.1	0.1	0.1	0.1	High	Negligible
R14	Brook Lane	1.2	1.2	1.2	1.3	1.3	High	Slight
R15	Orchard House	1.0	1.0	1.1	1.1	1.2	High	Slight
R16	Brook Cottage	0.2	0.2	0.2	0.3	0.3	High	Negligible
R17	Lambert's farm	0.1	0.1	0.2	0.2	0.2	High	Negligible
R18	Dairy Farm	0.1	0.1	0.1	0.1	0.1	High	Negligible
R19	Bremeridge Farm	0.1	0.1	0.1	0.1	0.1	High	Negligible
R20	School	0.1	0.1	0.1	0.1	0.2	High	Negligible
M1	P13/58 Primmers	0.2	0.2	0.2	0.2	0.3	High	Negligible
M2	P13/51 41 Haynes	0.1	0.1	0.1	0.1	0.1	High	Negligible
M3	P13/56 12 Fore St	0.1	0.1	0.1	0.1	0.1	High	Negligible
Assessment Criteria				**3.0**				

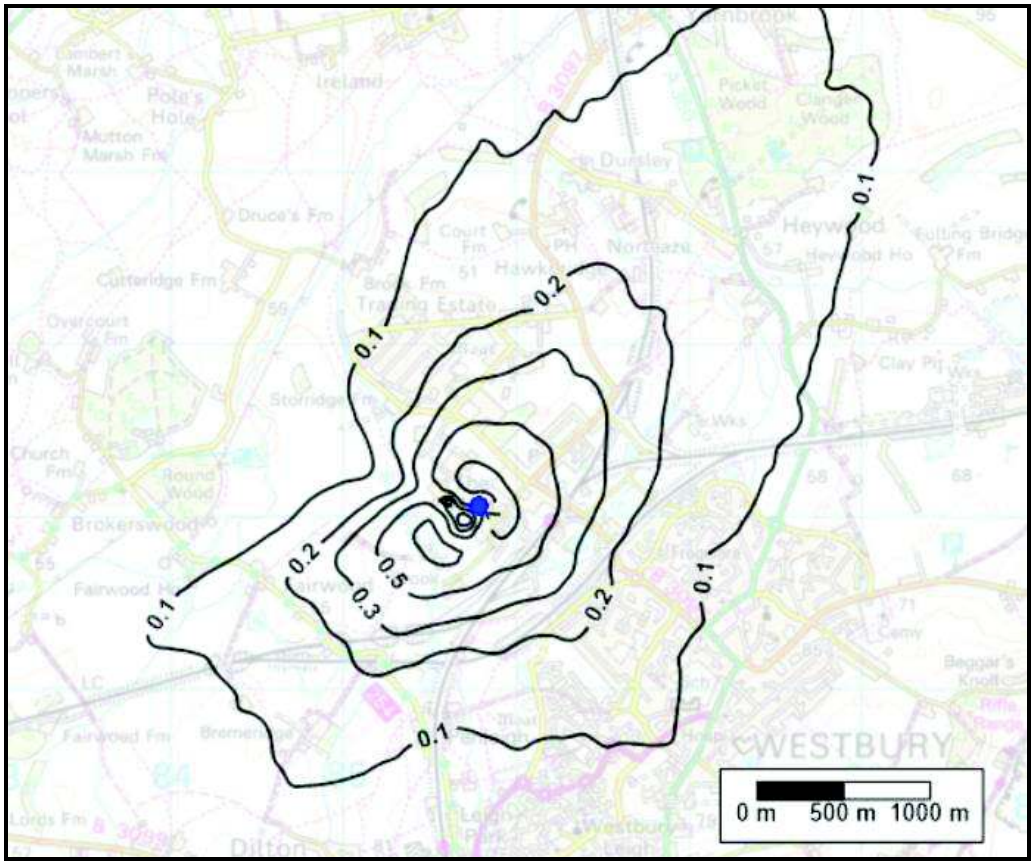
(a) The IAQM odour significance guidance is intended to determine the likelihood of annoyance and is not appropriate for use for the air intake of the dairy where tainting is the concern.

Table 5.7 shows that the predicted odour impacts are significantly below the level that would give rise to annoyance of 3.0 $OU_e\ m^{-3}$ and therefore can be screen out as having an impact of negligible significance.

There are four locations where the IAQM magnitude of change descriptor is slight. The IAQM guidance on odours states: Where the overall effect is greater than 'slight adverse', the effect is likely to be considered significant. This is a binary judgement: either it is 'significant' or 'not significant'. Therefore, in this case, the overall impact is 'not significant'.

Figure 5.3 shows the predicted distribution of odour concentration for emissions from the ventilation stack for 2016 which is the year that gives rise to the largest impact.

Figure 5.3 ADMS 5.2 Predicted 98th Percentile of Hourly Average Odour Concentrations (OU_e m^{-3}); 2016 Meteorological Data



Predictions have been made at the location of the air intake to the dairy because there is the potential for odour to taint the dairy products. The maximum predicted 98th percentile odour concentration at the dairy air intake is 0.10 OU_e m^{-3}. Even though this is only 3% of the threshold for annoyance there is still the possibility of detectable odours from time to time, but not at an intensity or duration likely to cause annoyance. .The potential for odour to cause tainting is considered in the next section.

The following are the widely accepted odour thresholds (1):

- 1 OU_e m^{-3} is the point of detection in a laboratory
- 3 OU_e m^{-3} is the recognition threshold
- 5 OU_e m^{-3} is a faint odour
- 10 OU_e m^{-3} is a distinct odour

For 2013 meteorological data the maximum one hour average odour concentrations at the location of the dairy air intakes is 2.3 OU_e m^{-3} which is less than the recognition odour threshold. During this hour there will be periods where odour concentration will be higher and lower than the average for the hour. The predictions show that the odours at the location of the air intakes will be undetectable over an averaging period of one hour. It should

(1) Environment Agency (March 2007) Review of odour character and thresholds.

also be noted that the prevailing background odour is likely to be in the range of 5 to 40 $OU_e\,m^{-3}$ ie considerably higher than the incremental increase predicted to occur due to emissions from the proposed facility (1).

5.5.2 BIOAEROSOLS

Bio-aerosols are assessed to determine the potential affect the dairy air filtration system.

Table 5.8 shows the predicted annual average concentrations of bio-aerosols for each of five years of meteorological data at the location of the dairy air intake (receptor R1).

Table 5.8 ADMS 5.2 Predicted Annual Average Bio-Aerosol Concentration at Dairy Air Intake (cfu m^{-3})

Meteorological Data Year	Annual Average (cfu m^{-3})
2012	0.0041
2013	0.0047
2014	0.0059
2015	0.0037
2016	0.0037
Maximum	0.0059
Assessment Criteria	500
Max as %age of Assessment Criteria	0.0%

Table 5.8 shows that the maximum predicted annual average concentration of bio-aerosols at the location of the dairy air intake is negligible.

5.5.3 TASTE, ODOUR AND HEALTH TAINT

Detailed work on the potential of emissions from the Northacre Resource Recovery Centre (RRC) to cause food, odour and health tainting of the products from the dairy was undertaken in 2008 (2). The conclusion of the assessment was that the risk of odour and taste tainting is negligible. The assessment found that (only) one compound (1,2-dichloroethane) exceeded the health taint threshold and that was by a factor of 3. The report stated that the assessment methodology was 'highly conservative' and that the risk present by 1,2-dichloroethane was 'low'.

The results of this study can be used to assess the risk of odour, taste and health tainting from the proposed facility.

Emissions from the ventilation stack are the most significant source of compounds that have the potential to cause tainting. Modelling of the concentration of bio-aerosols presented above shows a maximum concentration of 0.0059 cfu m^{-3} for an emission concentration of 1,000 cfu m^{-3}

(1) Environment Agency (March 2007) Review of odour character and thresholds.
(2) SLR (December 2008) Northacre Resource Recovery Centre (RCC) Detailed Assessment of Air Quality.

The concentration would be would be 0.059 cfu m^{-3} for an emissions concentration of 10,000 cfu m^{-3}. The concentration of 0.059 cfu m^{-3} can be compared to the concentration of ~2 cfu m^{-3} predicted for the MBT facility in SLR's 2008 report. Therefore, given that the same bio-aerosol source concentration is used, if emissions of VOCs with the potential to cause tainting are present in the same concentration for the proposed facility as for the MBT plant, the potential for tainting would be about 30 less for the proposed facility (ie ~0.059/~2). This is sufficient to conclude that the potential for odour, taste and health tainting from the proposed facility is negligible.

It should be noted that the only compound of significance (1,2 dichloroethane) was found to be present at a higher concentration in the air leaving the bio-filter than in the air entering it (ie the compound was being emitted from the bio-filters). Given that the proposed facility is not using bio-filters the source concentration of 1,2-dichloroethane will be lower than the MBT plant, further reducing the potential for tainting.

It should also be noted that this assessment very conservatively assumed continuous emissions from the ventilation stack.

5.6 PLUME VISIBILITY

5.6.1 INTRODUCTION

The water content of the emissions to atmosphere from the stack is 15.1% (v/v) which equates to a mixing ratio of 0.094 kg/kg (1). The temperature of the emissions on release to atmosphere is 125 deg C.

Once released to atmosphere the emissions will dilute, cool, and depending on the prevailing ambient temperature and relative humidity, may condense to form a visible vapour plume. The frequency and extent of any visible plume depends on the ambient temperature and relative humidity and the rate of plume dilution.

The ADMS 5.2 dispersion model has been used to predict the frequency and extent of a visible vapour plume.

5.6.2 PREDICTIONS OF VISIBLE VAPOUR PLUME

Predictions of the frequency and extent of a visible vapour plume have been made with the ADMS 5.2 plume visibility module. **Table 5.9** summarises the predictions of visible vapour plume length and frequency for each year of metrological data.

(1) www.humidity-calculator.com.

Table 5.9 Summary of ADMS 5.2 Predictions for Visible Vapour Plume

Year of Meteorological Data	2012	2013	2014	2015	2016	Average
%age occurrence of visible plume (%)	4.4%	6.3%	2.1%	2.4%	3.2%	**3.7%**
%age visible plume length > 250 m (%)	0.0%	0.1%	0.0%	0.0%	0.0%	**0.0%**
%age visible plume length > 100 m (%)	0.5%	1.1%	0.5%	0.3%	0.3%	**0.5%**
%age visible plume length > 50 m (%)	1.2%	2.7%	0.9%	0.8%	0.9%	**1.3%**
Maximum length of visible plume (m)	231	345	179	217	236	**-**
Average length of vapour plume (m)	44	59	57	45	42	**-**

Table 5.9 shows that for the year that gives rise to the highest frequency occurrence of visible vapour plumes (2013) the predicted occurrence is 6.3% of the time. The average percentage occurrence for the five years of meteorological data is 3.7%. It should be noted that these percentages are for all hours including night time hours where a higher frequency will occur due to lower ambient temperatures. The predictions of visible vapour plume shown in **Table 5.9** are less than those predicted and presented in the 2014 assessment due to improvements in the ADMS dispersion model.

5.6.3 DEPOSITION RATES

Presented in this section are the deposition rates for the pollutants released to atmosphere from the proposed facility where the Environment Agency's risk assessment guidance provides maximum deposition rates (1).

The Environment Agency H1 guidance states that the process contribution of air emissions deposited to land can be calculated by:

$PC_{ground} = (PC_{air} \times RR \times DV \times 3 \times 86{,}400)/1000$

Where:

PCground = process contribution to daily deposition rate (mg m^{-2} day^{-1})
RR = release rate (g s^{-1})
DV = deposition velocity (taken to be 0.01 m s^{-1})
PC_{air} = process contribution to air base on maximum annual average ground level concentration per unit mass release rate (µg m^{-3}/g s^{-1})

Value of 3 is nominal factor to convert dry deposition to total deposition.

Table 5.10 shows the estimated deposition rate at the point of maximum impact for the year that give rise to the largest impact (2012).

(1) https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#calculate-pc-for-substance-deposition.

Table 5.10 Deposition Rate

Pollutant	Emission Rate (mg s^{-1})	Deposition Rate (mg m^{-2} day^{-1})		Deposition Rate as a Percentage of the Max (%)
		Process Contribution	Maximum Rate [(a)]	
Arsenic (As)	0.035	0.000013	0.02	0.07%
Cadmium (Cd)	1.25	0.000475	0.009	5.3%
Chromium (VI)	0.0017	0.000001	1.5	0.0%
Copper (Cu)	2.79	0.001065	0.25	0.43%
Lead (Pb)	2.79	0.001065	1.1	0.10%
Mercury (Hg)	2.49	0.000951	0.004	23.8%
Nickel (Ni)	2.79	0.001065	0.11	0.97%
(a) Environment Agency H1 Guidance.				

The deposition rates presented in **Table 5.10** shows that the maximum rate is not exceeded by the process contribution. It should be noted that the modelling assumes the facility is operating continuously at full load and the impact at the point of maximum impact for the year that gives rise to the largest impact. Deposition rates at all other locations and years of metrological data will be less than the values shown.

Given the conservative nature of the assessment, it is considered that the deposition rates presented here show an acceptable impact.

6 PREDICTIONS AND ASSESSMENT OF IMPACTS ON VEGETATION AND ECOSYSTEMS

6.1 INTRODUCTION

So far, this assessment has focused on the potential impacts to human health of emissions to atmosphere from the proposed facility. There is also the potential for the facility to affect vegetation and ecosystems.

The impacts are assessed in the context of their critical levels and critical loads. The critical levels and critical loads are defined as follows (1).

Critical Loads are a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge

Critical Levels are the concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge.

6.2 ASSESSMENT OF CRITICAL LEVEL

The assessment on the effects on vegetation and eco systems conservatively assumes that emissions to atmosphere of the oxides of nitrogen (NO_x), sulphur dioxide (SO_2) and ammonia (NH_3) are all at their respective emissions limits as detailed in **Table 4.2**.

Table 6.1 shows the predicted annual average concentration (Process Contribution, PC) of the oxides of nitrogen (NO_x) at the five receptors of ecological importance and the percentage of the critical level which for the oxides of Nitrogen (NO_x) is 30 µg m^{-3}.

Table 6.1 ADMS 5.2 Predicted Incremental (Process Contribution) to Annual Average Concentrations of Oxides of Nitrogen (NO_x) at Ecological Receptors

No.	Description	Predicted Increment (NO_x, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 30 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	0.06	0.06	0.06	0.06	0.08	**0.08**	0.3%
E2	Salisbury SAC (Rep)	0.04	0.04	0.04	0.05	0.05	**0.05**	0.2%
E3	River Avon SAC	0.04	0.04	0.03	0.03	0.04	**0.04**	0.1%
E4	Picket & Clanger (Max)	0.51	0.37	0.44	0.47	0.31	**0.51**	1.7%
E5	Picket & Clanger (Rep)	0.42	0.31	0.36	0.37	0.26	**0.42**	1.4%

Table 6.1 shows that the predicted increments to annual average concentrations of the oxides of nitrogen (NO_x) are less than Environment

(1) www.apis.ac.uk.

Agency's 1% level of insignificance for all the ecological sites except Picket and Clanger Wood SSSI where the maximum impact is 1.7% and the impact at a representative location is 1.4%. Although the predicted impact at Picket and Clanger Wood is close to 1% because it is not less than 1% it requires further assessment.

Table 6.2 shows the Predicted Environmental Concentration (predicted increment + background concentration, PEC) of annual average concentration of the oxides of nitrogen (NO_x) at the five receptors of ecological importance and the percentage of the critical level which for the oxides of Nitrogen (NO_x) is 30 µg m^{-3}. Background is assumed to be 13.3 µg m^{-3}.

Table 6.2 ADMS 5.2 Predicted Environmental Concentration (PEC) of Annual Average Concentrations of Oxides of Nitrogen (NO_x) at Ecological Receptors

No.	Description	PEC (NO_x, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 30 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	13.4	13.4	13.4	13.4	13.4	**13.4**	44.6%
E2	Salisbury SAC (Rep)	13.3	13.3	13.3	13.3	13.4	**13.4**	44.5%
E3	River Avon SAC	13.3	13.3	13.3	13.3	13.3	**13.3**	44.5%
E4	Picket & Clanger (Max)	13.8	13.7	13.7	13.8	13.6	**13.8**	46.0%
E5	Picket & Clanger (Rep)	13.7	13.6	13.7	13.7	13.6	**13.7**	45.7%

Table 6.2 shows that the PEC is less than the critical level at all the receptors.

Table 6.3 shows the predicted maximum 24-hour average concentration (Process Contribution, PC) of the oxides of nitrogen (NO_x) at the five receptors of ecological importance and the percentage of the critical level which for the oxides of Nitrogen (NO_x) is 75 µg m^{-3}.

Table 6.3 ADMS 5.2 Predicted Maximum 24-Hour Average Concentration (Process Contribution) of Oxides of Nitrogen (NO_x) at Ecological Receptors

No.	Description	Predicted Increment (NO_x, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 75 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	0.98	1.21	0.91	0.95	0.72	**1.21**	1.6%
E2	Salisbury SAC (Rep)	0.79	1.28	0.74	0.62	0.52	**1.28**	1.7%
E3	River Avon SAC	0.55	1.05	0.39	0.39	0.52	**1.05**	1.4%
E4	Picket & Clanger (Max)	3.16	3.37	3.63	4.35	2.54	**4.35**	5.8%
E5	Picket & Clanger (Rep)	2.69	3.06	2.91	3.33	2.07	**3.33**	4.4%

Table 6.3 shows that the predicted 24-hour average concentration of the oxide of nitrogen (NO_x) are less than the Environment Agency's test for short term impacts for insignificance of 10% and therefore is insignificant.

Table 6.4 shows the predicted annual average concentration of sulphur dioxide (SO_2) at the five receptors of ecological importance and the percentage of the critical level which for the sulphur dioxide (SO_2) is 10 to 20 µg m^{-3} (10 µg m^{-3} for sensitive lichen and bryophytes and 30 µg m^{-3} for all higher plants).

Table 6.4 ADMS 5.2 Predicted Incremental (Process Contribution) to Annual Average Concentrations of Sulphur Dioxide (SO_2) at Ecological Receptors

No.	Description	Predicted Increment (SO_2, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 10-20 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	0.02	0.01	0.01	0.02	0.02	**0.02**	0.1% - 0.2%
E2	Salisbury SAC (Rep)	0.01	0.01	0.01	0.01	0.01	**0.01**	0.0% - 0.1%
E3	River Avon SAC	0.01	0.01	0.01	0.01	0.01	**0.01**	0.0% - 0.1%
E4	Picket & Clanger (Max)	0.13	0.09	0.11	0.12	0.08	**0.13**	0.4% - 1.3%
E5	Picket & Clanger (Rep)	0.11	0.08	0.09	0.09	0.06	**0.11**	0.4% - 1.1%

Table 6.4 shows that the predicted increments to annual average concentrations of sulphur dioxide (SO_2) are less than the Environment Agency's test for insignificance of 1% (ie less than 1.5%) and therefore are insignificant. There would therefore be justification not to consider the impact of sulphur dioxide (SO_2) further. However, for completeness, the deposition rates and contribution to acidification are assessed.

Table 6.5 shows the Predicted Environmental Concentration (ie predicted increment + background concentration, PEC) of annual average concentration of sulphur dioxide (SO_2) at the five receptors of ecological importance and the percentage of the critical level which for sulphur dioxide (SO_2) is 10 to 20 µg m^{-3}. Background is assumed to be 2.6 µg m^{-3}.

Table 6.5 ADMS 5.2 Predicted Environmental Concentration (PEC) of Annual Average Concentrations of Sulphur Dioxide (SO_2) at Ecological Receptors

No.	Description	PEC (SO_2, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 10-20 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	2.62	2.61	2.61	2.62	2.62	2.62	8.7% - 26.2
E2	Salisbury SAC (Rep)	2.61	2.61	2.61	2.61	2.61	2.61	8.7% - 26.1
E3	River Avon SAC	2.61	2.61	2.61	2.61	2.61	2.61	8.7% - 26.1
E4	Picket & Clanger (Max)	2.73	2.69	2.71	2.72	2.68	2.73	9.1% - 27.3
E5	Picket & Clanger (Rep)	2.71	2.68	2.69	2.69	2.66	2.71	9.0% - 27.1

Table 6.5 shows that the critical level for sulphur dioxide (SO_2) is not predicted to be exceeded.

Table 6.6 shows the predicted annual average concentration of ammonia (NH_3) at the eight receptors of ecological importance and the percentage of the critical level which for the ammonia (NH_3) 1 µg m^{-3} for sensitive lichen and bryophytes and 3 µg m^{-3} for all higher plants.

Table 6.6 ADMS 5.2 Predicted Incremental (Process Contribution) to Annual Average Concentrations of Ammonia (NH_3) at Ecological Receptors

No.	Description	Predicted Increment (NH_3, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 1-3 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	0.003	0.003	0.003	0.003	0.004	**0.004**	0.1% - 0.4%
E2	Salisbury SAC (Rep)	0.002	0.002	0.002	0.002	0.003	**0.003**	0.1% - 0.3%
E3	River Avon SAC	0.002	0.002	0.001	0.001	0.002	**0.002**	0.1% - 0.2%
E4	Picket & Clanger (Max)	0.026	0.019	0.022	0.023	0.016	**0.026**	0.9% - 2.6%
E5	Picket & Clanger (Rep)	0.021	0.015	0.018	0.019	0.013	**0.021**	0.7% - 2.1%

Table 6.6 shows that, at the most, the predicted annual average concentrations of ammonia are 0.9% to 2.6% of the Critical Level and therefore not at a level that is of concern.

Table 6.7 shows the Predicted Environmental Concentration of annual average concentration of ammonia (NH_3) at the five receptors of ecological importance and the percentage of the critical level. Background is assumed to be 1.9 µg m^{-3}.

Table 6.7 ADMS 5.2 Predicted Environmental Concentration (PEC) of Annual Average Concentrations of Ammonia (NH_3) at Ecological Receptors

No.	Description	PEC (NH_3, µg m^{-3}) for each year of Met Data						Percentage of Critical Level (% of 1-3 µg m^{-3})
		2012	2013	2014	2015	2016	Max	
E1	Salisbury SAC (Max)	1.90	1.90	1.90	1.90	1.90	**1.90**	63% - 190%
E2	Salisbury SAC (Rep)	1.90	1.90	1.90	1.90	1.90	**1.90**	63% - 190%
E3	River Avon SAC	1.90	1.90	1.90	1.90	1.90	**1.90**	63% - 190%
E4	Picket & Clanger (Max)	1.93	1.92	1.92	1.92	1.92	**1.93**	64% - 193%
E5	Picket & Clanger (Rep)	1.92	1.92	1.92	1.92	1.91	**1.92**	64% - 192%

Table 6.7 shows that the PEC exceeds the critical level at all the receptors as a direct consequence of the prevailing background concentration if there are sensitive lichen communities or bryophytes present, otherwise the critical level is not exceeded. Any exceedence is a direct consequence of the prevailing background concentration and not the contribution from the proposed facility.

There are no critical levels for hydrogen chloride (HCl).

6.3 ASSESSMENT OF CRITICAL LOAD

There are critical loads for eutrophication (ecosystem response to the addition of artificial or natural substances) and for acidification.

Assessment of critical load has not been undertaken for the Salisbury and River Avon SACs because the impacts for these locations are negligible (less than 1% of critical levels).

Nitrogen Deposition

The Picket and Clanger SSSI contains both coniferous and broad leaf woodland.

Table 6.8 shows the habitat descriptions that are relevant to atmospheric deposition and the critical load range for nitrogen deposition (Kg N ha^{-1} $year^{-1}$) which were obtained from the APIS web site (1).

Table 6.8 Site Description, Habitat and Nitrogen Deposition Critical Load Range (Kg N ha^{-1} $year^{-1}$)

No.	Description	Habitat	Critical Load Range	
			Min	Max
E4 and E5	Picket & Clanger SSSI	Coniferous Woodland	5	15
		Broadleaved, mixed and yew woodland	10	20

Table 6.9 shows the annual average process contribution (PC) at each ecological receptor for ammonia (NH_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and hydrogen chloride (HCl).

Table 6.9 ADMS 5.2 Predicted Annual Average Ground Level Concentrations, 2012 Meteorological Data (µg m^{-3})

No.	Description	NH_3	NO_2	SO_2	HCl
E4	Picket & Clanger (Max)	0.03	0.36	0.13	0.026
E5	Picket & Clanger (Representative)	0.02	0.30	0.09	0.021

Table 6.10 shows the Environment Agency (EA) dry deposition velocities used in this assessment (2).

(1) Air Pollution Information System (APIS) www.apis.ac.uk.
(2) Environment Agency (March 2014); AQTAG06; Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air.

Table 6.10 Dry Deposition Velocities (m s^{-1})

Pollutant	Forest
Nitrogen Dioxide (NO_2)	0.003
Sulphur Dioxide (SO_2)	0.024
Ammonia (NH_3)	0.030
Hydrogen Chloride (HCl)	0.060

Table 6.11 shows the annual average deposition rates at each ecological receptor for ammonia (NH_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and hydrogen chloride (HCl). For sulphur dioxide (SO_2), ammonia (NH_3) and nitrogen dioxide (NO_2) it is assumed that wet deposition is insignificant. For hydrogen chloride (HCl) the Environment Agency's factor of 3 is used to convert from dry deposition to total (wet + dry).

Table 6.11 Estimated Annual Average Deposition Rate (µg m^{-2} s^{-1})

No.	Description	NH_3	NO_2	SO_2	HCl
E4	Picket & Clanger (Max)	0.00077	0.00108	0.0031	0.0046
E5	Picket & Clanger (Rep)	0.00064	0.00089	0.0021	0.0038

Table 6.12 shows the nutrient nitrogen deposition rates (kg N ha^{-1} $year^{-1}$) at each ecological receptor for nitrogen from ammonia (NH_3), nitrogen dioxide (NO_2) and the total.

Table 6.12 Estimated Nutrient Nitrogen Deposition Rate (kg N ha^{-1} $year^{-1}$) [(a)]

No.	Description	From NH_3	From NO_2	Total
E4	Picket & Clanger (Max)	0.200	0.103	0.304
E5	Picket & Clanger (Rep)	0.166	0.086	0.251
(a) Factor used; NH_3 260, NO_2 95.9.				

Table 6.13 shows the calculated nitrogen deposition rates (Process Contribution) as a percentage of the critical load range and the total load (ie baseline + additional load).

Table 6.13 Nitrogen Deposition Rate and Critical Loads (Kg N ha^{-1} $year^{-1}$)

No.	Habit (Location)	Critical Load Range		Additional Load (PC)	%age of Critical Load	Baseline Deposition [(a)]	%age of Baseline	Total (PEC)
		Min	Min					
E4	Coniferous (Max)	5	15	0.304	2.0% - 6.1%	39.06	0.8%	39.36
E5	Coniferous (Rep)	5	15	0.251	1.7% - 5.0%	39.06	0.6%	39.31
E4	Broad leaf (Max)	10	20	0.304	1.5% - 3.0%	39.06	0.8%	39.36
E5	Broad leaf (Rep)	10	20	0.251	1.3% - 2.5%	39.06	0.6%	39.31
(a) Baseline deposition from www.apis.ac.uk								

Table 6.13 shows that as a percentage of the Critical Load the Process

Contribution (PC) is in the range of 1.3% to 6.1%. As a percentage of the existing baseline deposition the Process Contribution (PC) is less than 1%.

Although ammonia (NH_3) is an alkali it can have an acidifying effect on soils and freshwaters. This is because acid protons can be released through transformations in the soil or on leaf surfaces, eg via oxidation, nitrification, mediated by microbes and nitrifying bacteria. For this reason, the acidification potential of ammonia (NH_3) is added to that of nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and hydrogen chloride (HCl) to determine the over acidifying potential of emissions from the facility.

Table 6.14 shows the annual acid deposition rates (keq ha^{-1} $year^{-1}$) at each ecological receptor for ammonia (NH_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and hydrogen chloride (HCl).

Table 6.14 Estimated Annual Average Acid Deposition Rate (keq ha^{-1} $year^{-1}$) [(a)]

No.	Description	NH_3	NO_2	SO_2	HCl
E4	Picket & Clanger (Max)	0.014	0.007	0.030	0.040
E5	Picket & Clanger (Rep)	0.012	0.006	0.021	0.033
(a) Factor used; NH_3 18.5, NO_2 6.84, SO_2 9.84, HCl 8.63.					

As per EA guidance 'The acid contribution from HCl should be added to the S contribution and treated as S'.

Table 6.15 shows the total N and S deposition rates (keq ha^{-1} $year^{-1}$).

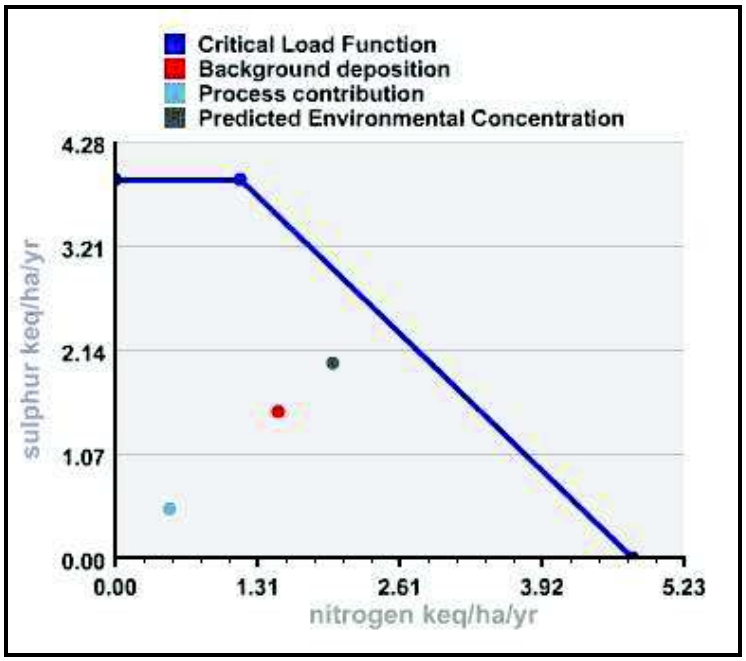
Table 6.15 ADMS 5.2 Total Nitrogen (N) and Sulphur (S) Acid Deposition Rates (Keq ha^{-1} $year^{-1}$)

No.	Description	S	N
E4	Picket & Clanger (Max)	0.070	0.022
E5	Picket & Clanger (Rep)	0.054	0.018

The critical load function for acidification is defined by three quantities CLmaxS, CLmaxN and CLminN. **Figure 6.1** illustrates how it is possible to compare acid deposition with the critical load function. In this case, both the background and the background plus Process Contribution (PC) are below the critical load function line and therefore there is no exceedence.

For acidification, the nitrogen (N) and sulphur (S) deposition rates are expressed as 'equivalents' which is a measure of how acidifying a substance can be. The units for N and S deposition are Keq ha^{-1} $year^{-1}$.

Figure 6.1 Illustration of Critical Load Function



Source: www.apis.ac.uk

The critical load function for each habitat and at each ecological receptor is available from the APIS web site and have been used in this assessment together with the tool to compare the acidification with the critical load function [(1)].

Table 6.16 shows the CLmaxS, CLmaxN and CLminN which define the critical load function and the baseline deposition rates.

Table 6.16 Critical Load Function and Baseline Deposition Rates (Keq N ha^{-1} $year^{-1}$)

No.	Description	Critical Load Function			Baseline Deposition Rate		
		CLmaxS	CLminN	CLmaxN	N	S	Total
E4	Picket & Clanger (Max)	2.7	0.36	3.06	2.79	0.22	3.01
E5	Picket & Clanger (Rep)	2.7	0.36	3.06	2.79	0.22	3.01

Table 6.17 shows the process contribution/additional loading, the Predicted Environmental Concentration (PEC) and the percentages of these compared to the critical load function for expected emissions. The calculations are made using the APIS critical load function tool.

(1) Air Pollution Information System (APIS) www.apis.ac.uk.

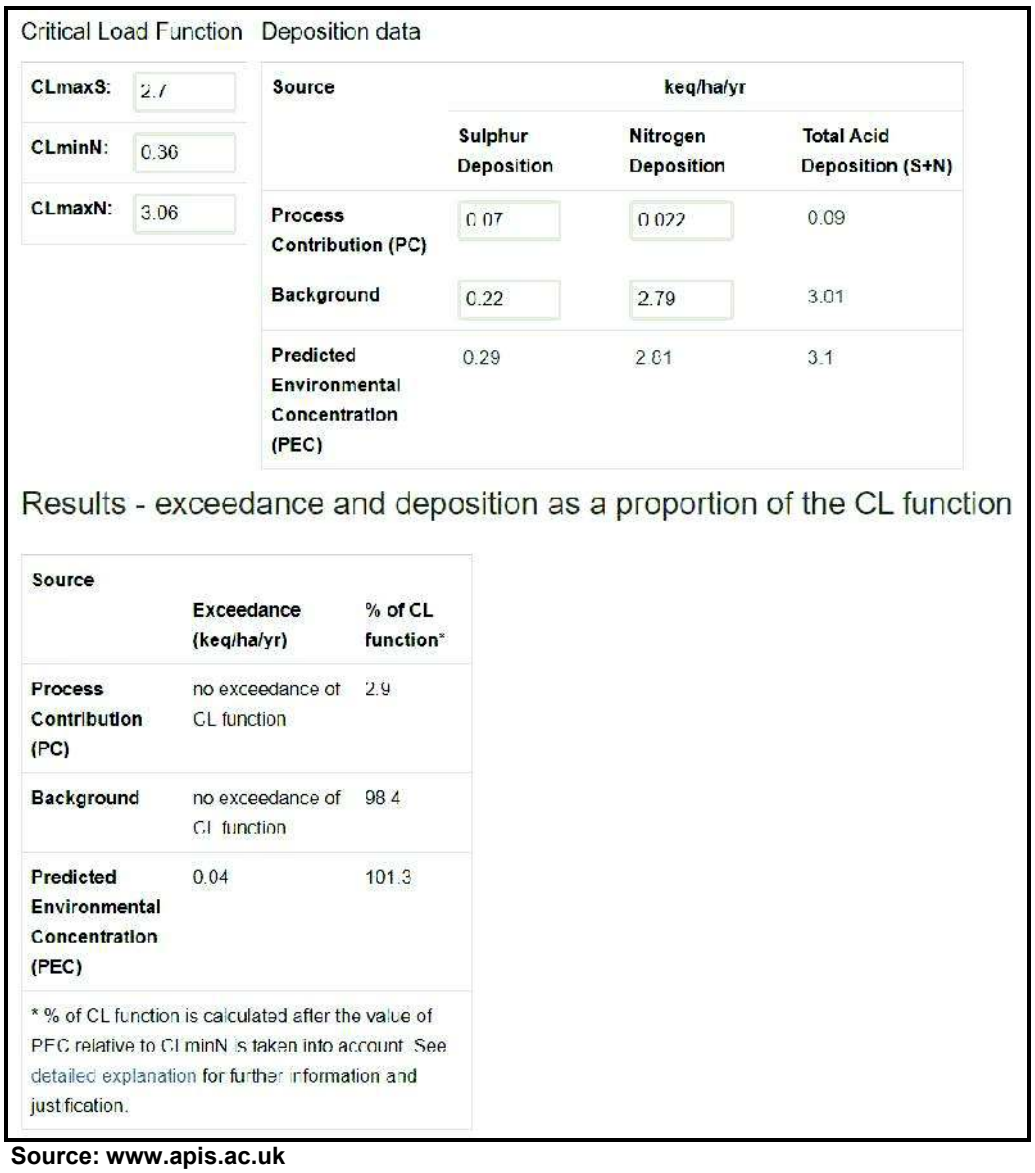
Table 6.17 Deposition and Deposition as Percentage of Critical Load Function (keg ha^{-1} year^{-1})

No.	Description	Process Contribution (PC)		PEC	PC (Percentage of CL Function, %)	PEC (Percentage of CL Function, %)
		S	N			
E4	Picket & Clanger (Max)	0.070	0.022	3.10	2.9	101.3
E5	Picket & Clanger (Rep)	0.054	0.018	3.08	2.3	100.7

Table 6.17 shows that the acid deposition is at most 2.9% of the critical load. It is considered that the impacts at the levels predicted are not of concern to habitats and ecosystems.

Figure 6.2 shows the full details for the calculation of the Critical Load Function for the point of maximum impact.

Figure 6.2 Critical Load Function for Point of Maximum Impact, E4



Critical Load Function Deposition data

CLmaxS:	2.7
CLminN:	0.36
CLmaxN:	3.06

Source	keq/ha/yr		
	Sulphur Deposition	Nitrogen Deposition	Total Acid Deposition (S+N)
Process Contribution (PC)	0.07	0.022	0.09
Background	0.22	2.79	3.01
Predicted Environmental Concentration (PEC)	0.29	2.81	3.1

Results - exceedance and deposition as a proportion of the CL function

Source	Exceedance (keq/ha/yr)	% of CL function*
Process Contribution (PC)	no exceedance of CL function	2.9
Background	no exceedance of CL function	98.4
Predicted Environmental Concentration (PEC)	0.04	101.3

* % of CL function is calculated after the value of PEC relative to CL minN is taken into account. See detailed explanation for further information and justification.

Source: www.apis.ac.uk

7 SENSITIVITY ANALYSIS

7.1 INTRODUCTION

This section considers the sensitivity of model predicted concentrations to the following:

- Meteorological data
- Roughness length
- Grid spacing
- Building downwash
- Terrain
- Stack height
- Part-load operation
- Peak emissions

7.2 BUILDING DOWNWASH AND TERRAIN

The modelling presented in this assessment includes the effects of both building downwash and terrain. **Table 7.1** shows the predicted maximum ground level concentration of nitrogen dioxide (NO_2) both with and without the effects of building downwash and terrain using 2012 meteorological data.

Table 7.1 ADMS 5.2 Maximum Predicted Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3}) [(a)]

Building Downwash	Terrain	Annual Average	99.8^{tn} Percentile of Hourly Averages
Yes	Yes	1.03	8.0
No	Yes	0.60	7.1
Yes	No	1.04	8.0
No	No	0.57	6.2
Assessment Criteria		**40**	**200**

(a) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.1 shows that building downwash and terrain effects are predicted to have only a small effect on the maximum predicted ground level concentration.

7.3 METEOROLOGICAL DATA

The assessment presented in this report is based on predictions made using five years (2012-2016) of meteorological data from Lyneham.

To illustrate the year to year variation in meteorological data, **Table 7.2** shows the maximum predicted ground level concentration of nitrogen dioxide (NO_2) for each of the five years of meteorological data from Lyneham together with predictions made with 2016 meteorological data from Boscombe Down which is an alternative choice for source of meteorological data.

Table 7.2 ADMS 5.2 Maximum Predicted Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, $\mu g\,m^{-3}$) (a)

Year and Source	Annual Average	99.8th Percentile of Hourly Averages
Lyneham 2012	1.03	8.0
Lyneham 2013	0.74	7.7
Lyneham 2014	0.83	10.1
Lyneham 2015	0.94	8.4
Lyneham 2016	0.64	8.5
Boscombe Down 2016	0.71	7.5
Assessment Criteria	**40**	**200**

(a) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.2 shows that there is some year to year variation in predicted concentrations although the variation is not considered to be significant. The maximum predicted concentration using meteorological data from Boscombe Down is a little lower than using data from Lyneham. This shows that the selection of metrological data is conservative.

7.4 ROUGHNESS LENGTH

The roughness length of 0.3 m used in this assessment was selected using professional judgement because roughness length is not something that can be directly measured. In practice, there is no one unique roughness that fits a given wind speed profile. Roughness length will also vary depending on wind direction and other factors such as the season of the year.

It is therefore of interest to see how sensitive the model predictions are to roughness length.

Table 7.3 shows the maximum predicted ground level concentration of nitrogen dioxide (NO_2) for roughness lengths in the range of 0.1 m to 0.5 m using 2012 meteorological data.

Table 7.3 ADMS 5.2 Maximum Predicted Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, $\mu g\,m^{-3}$) (a)

Roughness Length (m)	Annual Average	99.8th Percentile of Hourly Averages
0.1	0.75	7.9
0.3	1.03	8.0
0.5	1.22	8.0
Assessment Criteria	**40**	**200**

(b) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.3 shows that in this modelling situation, increasing the roughness length increases the maximum predicted annual average concentrations but has little effect on the maximum predicted 99.8th percentile.

7.5 GRID SPACING

If the grid spacing is too large then it is possible that the reported maximum concentrations will not be the actual maxima. This assessment uses a grid spacing of 100 m. One way to demonstrate that the grid spacing is adequate is to model with smaller grid spacing and if the maximum concentration is not significantly different then one can be confident that the grid spacing is adequate.

Table 7.4 shows the maximum predicted ground level concentration of nitrogen dioxide (NO_2) for the grid spacing of 100 m used in this assessment together with 60 m and 150 m grid spacing. Predictions are made using 2012 meteorological data.

Table 7.4 ADMS 5.2 Maximum Predicted Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3}) [(a)]

Grid Spacing (m)	Annual Average	99.8th Percentile of Hourly Averages
60	1.04	8.2
100	1.03	8.0
150	1.01	7.8
Assessment Criteria	**40**	**200**

(c) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.4 shows that reducing grid spacing does not have a significant effect on the maximum predicted concentrations.

7.6 STACK HEIGHT

Table 7.5 shows the ADMS 5.2 maximum predicted annual average and 99.8th percentile of hourly average concentrations of nitrogen dioxide (NO_2) for stack heights in the range of 65 m to 85 m. Predictions are made for 2012 meteorological data.

Table 7.5 ADMS 5.2 Maximum Predicted Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2 µg m^{-3}) Effect of Stack Height [(a)]

Stack Height (m)	Annual Average	99.8th Percentile
65	1.78	12.2
70	1.31	9.6
75	1.03	8.0
80	0.84	7.0
85	0.68	6.2

(a) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.5 shows that the benefits in terms of reduction in the maximum ground level concentration of nitrogen dioxide (NO_2) for stack heights above the proposed height of 75 m are minimal.

7.7 PART-LOAD OPERATION

When the facility is operating at part-load both the exit velocity and pollutant emission rates will be lower. It is possible that the impacts will be higher during part-load operation is the effect of the reduced plume ruse caused by the lower exit velocity if not fully off-set by reduced pollutant emission rate occurring because of the reduced flow rate.

To determine the sensitivity of the predicted presented in this assessment to part load operation, modelling has been undertaken at both 100% and 75% load

Table 7.6 shows the emissions data used in the assessment (100%) and those used to determine the impacts for 75% operation.

Table 7.6 Emissions and Physical Properties, Main Stack (Combined for Two Flues)

Parameter	Value	
Number of stacks	1	
Number of flues	2	
OS Grid Reference (m)	385774 152070	
Release height above ground level (m)	75	
Flue diameter (m)	1.98 [(a)]	
Percentage of Maximum	**100%**	**75%**
Actual volumetric flow rate ($Am^3 s^{-1}$)	55.4	41.6
Exhaust gas oxygen content (% v/v wet)	4.8	4.8
Exhaust gas water content (% v/v)	15.1	15.1
Exit velocity ($m s^{-1}$)	18.0	13.5
Flue gas emission temperature (deg C)	125	125
Normalised volumetric flow ($Nm^3 s^{-1}$) [(b)]	49.9	37.4
Oxides of nitrogen ($mg Nm^{-3}$) NO_x as NO_2)	200	200
Oxides of nitrogen ($g s^{-1}$) NO_x as NO_2)	10.0	7.5

(c) Effective diameter of two flues.
(d) Corrected for: temperature; 273 k; pressure; 101.3kPa (1 atmosphere); dry; 11% v/v O_2.

Table 7.7 shows the maximum predicted annual average and 99.8th percentile concentration of nitrogen dioxide (NO_2) for both the 100% and 75% case for each of five years of meteorological data.

Table 7.7 ADMS 5.2 Maximum Predicted (Process Contribution) Annual Average and 99.8th Percentile of Hourly Average Concentrations of Nitrogen Dioxide (NO_2, µg m^{-3}) for Both Full Load (100%) and 75% Load [(a)]

Year	Annual Average		99.8th Percentile of Hourly Averages	
	100%	75%	100%	75%
2012	1.03	0.94	8.0	7.1
2013	0.74	0.67	7.7	6.9
2014	0.83	0.77	10.1	8.8
2015	0.94	0.86	8.4	7.6
2016	0.64	0.60	8.5	7.7
Assessment Criteria	**40**		**200**	

(e) Assumes 70% oxidation for annual average and 35% for 99.8th percentile.

Table 7.7 shows that the impacts are lower when the facility is operating at 75% load than at 100% load and therefore the 100% load scenario modelled in the assessment is the one that gives rise to the highest impact.

7.8 PEAK EMISSIONS

The assessment has assumed that the pollutant emission concentration are either at their long term emission limit and assumes that these occur for the year of meteorological data that gives rise to the highest impact (out of five years). It is considered that this approach is robust and conservative.

It is however, theoretically possible that the short term impacts could be higher than those presented. For example, for the oxides of nitrogen (NO_x) an emission concentration of 200 mg Nm^{-3} has been used in the assessment as the emission concentration for both long and short term impact. There is a short term emission limit which states that 97% of the half hourly concentrations are no more than 200 mg Nm^{-3} and that the maximum half hour concentration is no more than 400 mg Nm^{-3}. Therefore, if the proposed facility were to operate at its very maximum permissible short term emission levels, the emission concentration could be more than 200 mg Nm^{-3} for 3% of the time and at a maximum concentration of 400 mg Nm^{-3} for 30 minutes. It is considered that making the assumption that the emission concentration will be at 400 mg Nm^{-3} for the 18 hours of the year that gives rise to the worst dispersion (this is the value that makes up the 99.8th sort term objective) is illogical as it could never occur.

However, as part of the sensitivity analysis, predictions are presented making the assumption that the facility is operating at its short term emissions limits for the hours that give rise to the worst dispersion and for the frequency and duration of the ambient air quality assessment criteria..

Table 7.8 shows the short term emissions concentrations, also shown are the long term emission concentration used in the assessment for reference.

Table 7.8 Pollutant Emission Concentration [(a)]

Pollutant	Long Term	Short Term		
Oxides of nitrogen (NO_x as NO_2)	200	400	mg Nm^{-3}	
Sulphur dioxide (SO_2)	50	200	mg Nm^{-3}	
Particulate matter (PM_{10})	10	30	mg Nm^{-3}	
Carbon monoxide (CO)	50	50	mg Nm^{-3}	
Hydrogen chloride (HCl)	10	60	mg Nm^{-3}	
Hydrogen fluoride (HF)	1	4	mg Nm^{-3}	
Ammonia (NH_3)	10	10	mg Nm^{-3}	
Benzene	1	1	mg Nm^{-3}	
Cadmium (Cd)	0.025	0.25	mg Nm^{-3}	(b)
Mercury (Hg)	0.05	0.05	mg Nm^{-3}	
Antimony (Sb)	0.056	0.056	mg Nm^{-3}	
Lead (Pb)	0.056	0.056	mg Nm^{-3}	(c)
Chromium (Cr)	0.056	0.056	mg Nm^{-3}	(c)
Cobalt (Co)	0.056	0.056	mg Nm^{-3}	(c)
Copper (Cu)	0.056	0.056	mg Nm^{-3}	(c)
Manganese (Mn)	0.056	0.056	mg Nm^{-3}	(c)
Nickel (Ni)	0.056	0.056	mg Nm^{-3}	(c)
Vanadium (Vn)	0.056	0.056	mg Nm^{-3}	(c)
Arsenic (As)	0.0007	0.0007	mg Nm^{-3}	(d)
Chromium (VI)	0.000035	0.000035	mg Nm^{-3}	(d)
Dioxins & furans (I-TEQ)	0.1	0.1	ng Nm^{-3}	
PAHs	0.1	0.1	ng Nm^{-3}	
PCBs	0.0026	0.0026	ng Nm^{-3}	(e)

(a) Corrected for: Temperature; 273 K; Pressure; 101.3 kPa (1 atmosphere); dry; 11% v/v O_2.
(b) Assumes that cadmium is 50% of the total of cadmium plus thallium (tl).
(c) The IED limit for nine metals is 0.5 mg Nm^{-3} this assessment assumes that these metals are no more than 1/9 of this limit.
(d) Environment Agency Guidance (September 2012); Mean measured concentration from 20 WID plants used.
(e) Environment Agency (30 April 2014) personal communication).

Table 7.9 shows the emission rates which are the totals for both flues.

Table 7.9 Pollutant Emission Rate

Pollutant	Long Term	Short Term	
Oxides of nitrogen (NO_x as NO_2)	9.98	19.95	g s^{-1}
Sulphur dioxide (SO_2)	2.49	9.98	g s^{-1}
Particulate matter (PM_{10})	0.50	1.50	g s^{-1}
Carbon monoxide (CO)	2.49	2.49	g s^{-1}
Hydrogen chloride (HCl)	0.50	2.99	g s^{-1}
Hydrogen fluoride (HF)	0.05	0.20	g s^{-1}
Ammonia (NH_3)	0.50	0.50	g s^{-1}
Benzene (C_6H_6)	0.05	0.05	g s^{-1}
Cadmium (Cd)	1.25	12.47	mg s^{-1}
Mercury (Hg)	2.49	2.49	mg s^{-1}
Antimony (Sb)	2.79	2.79	mg s^{-1}
Lead (Pb)	2.79	2.79	mg s^{-1}
Chromium (Cr)	2.79	2.79	mg s^{-1}
Cobalt (Co)	2.79	2.79	mg s^{-1}
Copper (Cu)	2.79	2.79	mg s^{-1}
Manganese (Mn)	2.79	2.79	mg s^{-1}
Nickel (Ni)	2.79	2.79	mg s^{-1}
Vanadium (Vn)	2.79	2.79	mg s^{-1}
Arsenic (As)	0.035	0.035	mg s^{-1}
Chromium (VI)	0.0017	0.0017	mg s^{-1}
Dioxins & furans (I-TEQ)	4.99	4.99	ng s^{-1}
PAHs	4.99	4.99	ng s^{-1}
PCBs	0.13	0.13	ng s^{-1}

Table 7.10 shows short term predictions made using the short term emission rates. This is an extremely conservative assumption as it assumes that the facility will be operating at its maximum half hour emission value for the whole hour (or number of hours) of the year that give rise to the worst dispersion. The table only shows predictions where there is a short term ambient air quality standard and uses the year of meteorological data that give rise to the highest impact.

Table 7.10 ADMS 5.2 Maximum Predicted Incremental Concentrations due to Emissions to Atmosphere from the Proposed Facility (µg m^{-3}, Using Short Term Emission Limits), 2012 Meteorological Data

Pollutant	Period	Allowable Number of Exceedences per year	Predicted Concentration (µg m^{-3})	Assessment Criteria (µg m^{-3})	Percentage of Assessment Criteria (%)
Nitrogen dioxide (NO_2)	1 hour	18	16.0	200	8.0%
Particulate matter (PM_{10})	24 hour	35	0.74	50	1.5%
Sulphur dioxide (SO_2)	15 min	35	25.9	266	9.7%
	1 hour	24	22.0	350	6.3%
	24 hour	3	11.0	125	8.8%
Carbon monoxide	8 Hour	-	5.30	10,000	0.1%
Hydrogen chloride	1 Hour	-	17.7	750	2.4%
Hydrogen fluoride (HF)	1 Hour	-	1.18	160	0.7%
Benzene (C_6H_6)	1 Hour	-	0.30	195	0.2%
Antimony (Sb) [(a)]	1 Hour	-	0.017	150	0.0%
Chromium (Cr) [(b)]	1 Hour	-	0.017	150	0.0%
Copper (Cu)	1 Hour	-	0.017	200	0.0%
Manganese (Mn)	1 Hour	-	0.017	1,500	0.0%
Mercury (Hg)	1 Hour	-	0.015	7.5	0.2%
Vanadium (Vn)	1 Hour	-	0.017	1	1.7%
PCBs (TEQ, fg/m^{-3})	1 Hour		0.77	6	0.0%

(a) Antimony and compounds (as Sb) except antimony trisulphide and antimony trioxide.
(b) Chromium, chromium (II) compounds and chromium (III) compounds (as Cr).

Table 7.10 shows that even with the very conservative assumption of using the maximum half hour average emission rate for the short term predictions, the assessment criteria are not approached and are considered to be insignificant.

8 MITIGATION AND RESIDUAL IMPACTS

8.1 INTRODUCTION

The assessment presented in this report assumes appropriate levels of mitigation and therefore the predicted impacts are those following mitigation and can be considered to be the residual impacts.

This section outlines the mitigation measures that are inherent in the design, construction and operation of the facility.

8.2 CONSTRUCTION

Emissions of dust generated during construction can be almost entirely abated by mitigation measures should these be necessary. The mitigation measures that will be employed during construction will be those set out in the IAQM dust guidance for medium risk site. The measures will be discussed and agreed with the Wiltshire Council prior to construction.

8.3 OPERATION

The assessment presented in this report shows that the dispersion provided by a 75 m main stack and 40 m ventilation stack is sufficient to render the emissions harmless at ground level and therefore no further mitigation measures are required.

9 SUMMARY AND CONCLUSIONS

Hills Waste Solutions Ltd has commissioned Atmospheric Dispersion Modelling Ltd (ADM Ltd) to undertake an air quality assessment of emissions to atmosphere from Northacre Renewable Energy, to be located to the north of Westbury, Wiltshire.

This assessment is an update of the previous assessment that was submitted to support the 2015 planning application (1).

Emissions to atmosphere will occur from the following sources:

- twin flue 75 m high stack
- 40 m high ventilation stack

The ADMS 5.2 dispersion model has been used to make predictions of ground level concentrations of the pollutants released to atmosphere from the proposed facility.

The following are the principal conclusions that can be drawn from this assessment, which has been undertaken using the emissions data provided and the assumptions specified:

- Emission to atmosphere from the 75 m main stack is predicted to not significantly affect air quality at ground level and the impact is considered to be insignificant.

- Potential for annoyance due to emissions of odours from the ventilation stack is predicted to be negligible.

- Potential for emissions of bio-aerosols from the ventilation stack to affect the operation of dairy is predicted to be negligible.

- Potential for emissions of volatile organic compounds (VOCs) from the ventilation stack to taint food products at the dairy is considered to be negligible.

- It is considered that the overall impact on air quality of emissions to atmosphere from the proposed facility can be described as of **minor significance**. This conclusion is based on all the impacts presented in the assessment and takes account of the localised nature of the area of maximum impact.

- This assessment, which is an update of the previous assessment that was submitted to support the 2015 planning application, shows that the impacts of emissions to atmosphere are similar or less than those predicted for the approved 2015 application.

(1) ADM (16 December 2014) Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury.

Appendix A:

Health Risk Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury

P1713

A Report Prepared for
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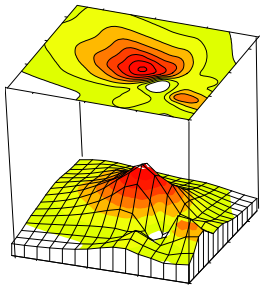

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Client: Hills Waste Solutions Ltd

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Attachment 1: HMIP Dioxins/Furans Model Detailed Inputs and Outputs: *Worst Case* Emissions Scenario

A1. INTRODUCTION

A1.1 SCOPE OF THE ASSESSMENT

Hills Waste Solutions Ltd has commissioned Atmospheric Dispersion Modelling Ltd (ADM Ltd) to undertake a health risk assessment (HRA) of dioxin, furan and PCB emissions to atmosphere from the approved Northacre Renewable Energy facility at Westbury in 2014. The HRA is limited to consideration of dioxins, furans and PCBs. The assessment of all other substances including metals, benzene, oxides of nitrogen and particulate matter are included in the air quality assessment which shows that the impacts are not of concern to human health. There are no ambient air quality standards for dioxins/furans and so their impact cannot easily be assessed in the same way.

Consideration is also given to emissions of Polychlorinated Biphenyls (PCBs) because the Environment Agency (EA) routinely requests its inclusion in HRAs because they are similar in nature to dioxins and furans in terms of human health impact.

This report also updates the emissions data and is based on the updated air dispersion modelling which also uses more recent meteorological data (2012-2016).

The HRA is based on outputs from the latest air quality assessment (1).

The assessment considers the human health impact of emissions on an adult Hypothetical Maximum Exposed Individual (HMEI). Hence, this assessment is an assessment of the incremental additional risk resulting from the operation of the proposed facility (see *Section A3.2* for further explanation).

The HMEI exposure represents a highly unrealistic situation in which all exposure assumptions are set at their maximum value. While high-end individual pathway exposure estimates may represent actual exposure possibilities (albeit at very low likelihood), the possibility of all the high-end exposure assumptions made in this assessment accumulating in one individual is, for practical purposes, never realised. Therefore, HMEI intakes should be regarded with caution and should not be taken as representative of actual exposures. Several scenarios for emissions of dioxins/furans have been considered (see *Section A2.3* for further explanation).

(1) ADM Ltd (February 2018), **Air Quality Assessment of Emissions to Atmosphere from Northacre Renewable Energy, Westbury (P1713)**.

A1.2 APPROACH TO THE ASSESSMENT

The risk assessment process follows a structured approach as set out in HMIP's (one of the predecessors to the Environment Agency) 1996 report [(1)].

The approach consists of four major steps:

A) Hazard identification: The hazard identification process determines whether human exposure to a substance could cause an increase in adverse health effects. It involves characterising the nature and quantity of the stack emissions, selecting *indicator* chemicals, evaluating data on the types of health injury or disease and identifying the conditions of exposure under which injury or disease may occur.

B) Dose-response evaluation: The dose-response evaluation involves the quantification of the relationship between the degree of exposure to a substance and the extent of a potential health effect, generally based upon data derived from animal experimental studies or, less frequently, from studies of exposed human populations.

C) Quantification of the exposure: An exposure evaluation determines the dose and intake of key indicator chemicals of a hypothetically exposed person or population. The dose is defined as the amount of a substance contacting body boundaries (in the case of inhalation, the lungs) and intake is the amount of the substance absorbed into the body. The evaluation is based upon worst-case, conservative scenarios, with respect to the following:

- location of the exposed individual and duration of exposure;
- exposure rate;
- emission rate from the source.

D) Risk characterisation: Following the above steps, the risk is characterised by examining the toxicity of the chemicals to which the individual has been exposed, and evaluating the significance of the calculated dose.

(2) DOE (1996) **Risk Assessment of Dioxin Releases from Municipal Waste Incineration Processes** Contract No. HMIP/CPR2/41/1/181.

A2. METHODOLOGY FOR ESTIMATING EXPOSURE TO EMISSIONS

A2.1 INTRODUCTION

A risk assessment for the purposes of characterising the health impact of the dioxin, furan emissions from the facility can be divided into the following steps.

(1) Measure or estimate emissions from the source.

(2) Model the transport and fate of the emissions through the relevant pathways, such as the atmosphere and through soil, water and biota following deposition onto land. Estimate concentrations of the emitted chemicals in the environmental media at the point of exposure.

(3) Calculate uptake of the emitted chemicals into humans coming into contact with the affected media.

(4) Assess the significance of the absorbed dose in terms of a likely health impact.

With regard to Step (3), the exposure assessment considers the uptake of PCDD/Fs (dioxins/furans) by an adult Hypothetical Maximum Exposed Individual (HMEI). Step (4) involves comparison with an acceptable dose and this is specified as a tolerable daily intake (TDI) as a lifetime average and hence cannot be used to assess the specific intake during childhood. The TDI used for the assessment includes the period for which the person was a child.

A2.2 POTENTIAL EXPOSURE PATHWAYS

There are potentially six exposure pathways of concern following the introduction of substances into the atmosphere:

- inhalation of air;
- ingestion of food;
- ingestion of drinking water;
- dermal (skin) contact with soil;
- intentional ingestion of soil;
- dermal (skin) contact with water.

A2.3 EXPOSURE PATHWAYS CONSIDERED IN THE ASSESSMENT

Dermal contact with soil and intentional ingestion of soil (known as *pica)* are screened out as significant exposure pathways on the basis of the infrequent and sporadic nature of the events and the very low dermal and ingestion absorption factors for these exposure routes, coupled with the low plausible total dose which might be experienced (when considered over the lifetime of an individual). Health risk assessments of similar emissions (Pasternach (1989) ***The Risk Assessment of Environmental and Human Health Hazards***, John Wiley, New York) have concluded that dermal absorption and ingestion of soil

are at least one order of magnitude less efficient than lung absorption. Additionally, in the case of soil ingestion, the possible levels of soil contamination are estimated, at worst, to be no more than the contamination of food. The contamination in soil is also likely to be less bioavailable than that in food. Therefore, it is considered that the risk from soil ingestion is adequately covered by considering the risk of an exposed individual from ingesting contaminated food.

Similar arguments are relevant with respect to the elimination of aquatic pathways from consideration; swimming, fishing and other recreational activities are also sporadic and unlikely to lead to significant exposures or uptake of any contamination into the human body. Exposure via drinking water requires contamination of drinking water sources local to the point of consumption. The likelihood of contamination reaching a level of concern in the local water sources and ground water supplies is extremely low, making this pathway insignificant in terms of the total potential uptake.

On the basis of the assessment of the potential significance of the exposure pathways the key exposure pathways which are relevant to the assessment and, hence, subject to examination in detail are as follows:

- inhalation;
- ingestion of food.

The exposures arising due to the consumption of food are assessed with reference to the following food groups:

- milk and dairy produce;
- eggs;
- beef;
- lamb;
- pork;
- chicken;
- fish;
- root vegetables;
- leafy vegetables;
- potatoes;
- legumes;
- fruit; and
- cereals.

The inclusion of all food groups in the assessment conservatively assumes that both arable and pasture land and suitable rivers/lakes (for edible fish) are present in the vicinity of the predicted maximum annual average ground level concentration. It is assumed in the method that all of these food groups are grown/harvested locally(1). This is, in reality, a very unlikely scenario, but it has been included as a means of building a high degree of conservatism into the

(1) There is a dairy just to the north of the site. However, the method of assessment presented here already assumes that all milk and dairy products consumed are from cows that are continuously present at the point of maximum impact from the facility.

assessment and, hence, reducing the possibility of exposures being underestimated.

The substances which have been considered in the assessment are a range of dioxins and furans (PCDD/Fs) as shown in **Table A2.3**.

The emissions from the proposed facility have been previously discussed in detail in the air quality assessment as have the predicted maximum ground level concentrations resulting from these emissions. The *Worst Case* scenario for emissions of dioxins and furans (and hence increments to ground level concentrations resulting from the facility) have been used in this assessment, i.e. emissions at one hundred (100) times the emission limit (10 ng Nm^{-3}) for 60 hours of the year and at the emission limit (0.1 ng Nm^{-3}) for the remainder of the year (8700 hours). The data are summarised in **Table A2.1**. The base case (emissions at the emission limit for 100% of the year) is not included in this assessment but results would be 40% lower than those reported here for the *Worst Case*.

Table A2.1 Dioxins/furans (I-TEQ) Emitted from the Proposed Stack

Scenario	Annual Mean Concentration (ng Nm^{-3}) [(a) (b)]	Annual Mean Emission Rate (ng s^{-1}) [(b)]
Worst Case	0.1678	8.37
(a) Corrected for: Temperature; 273 K; Pressure; 101.3 kPa (1 atm); dry; 11% v/v O_2		
(b) ng = nano gram = 10^{-9} g = 0.000 000 001 g		

These emission rates from the proposed facility result in the maximum annual mean ground level concentrations shown in **Table A2.2**.

Table A2.2 *Worst Case* Annual Mean Ground Level Concentrations resulting from the Dioxins/furans (I-TEQ) Emissions from the Proposed Facility

Met Year	Concentration (µg m^{-3})
2012	1.2314 x 10^{-9} µg m^{-3} (or 1.2314 fg m^{-3}) [(a)]
2013	0.8832 x 10^{-9} µg m^{-3} (or 0.8832 fg m^{-3}) [(a)]
2014	0.9963 x 10^{-9} µg m^{-3} (or 0.9963 fg m^{-3}) [(a)]
2015	1.1287 x 10^{-9} µg m^{-3} (or 1.1287 fg m^{-3}) [(a)]
2016	0.7669 x 10^{-9} µg m^{-3} (or 0.7669 fg m^{-3}) [(a)]
Minimum	0.7769 x 10^{-9} µg m^{-3} (or 0.7769 fg m^{-3}) [(a)]
Mean	1.0013 x 10^{-9} µg m^{-3} (or 1.0013 fg m^{-3}) [(a)]
Maximum	1.2314 x 10^{-9} µg m^{-3} (or 1.2314 fg m^{-3}) [(a)]
(a) fg is a femtogram equivalent to 10^{-15} grams.	

The values presented are for each of the years of met data modelled. In order to contribute to the *Worst Case* (hypothetical maximum) scenario the maximum result of the five years modelled has been used in this assessment (*i.e.* the results for 2012 met data).

The exposure methodology determines the fate and transport of PCDD/Fs on a congener specific basis. Therefore, information regarding the PCDD/F annual

mean ground level concentrations on a congener specific basis is required. For the purposes of the exposure assessment, the congener profile for the Base Case operation (*i.e.* emissions are at the emission limit of 0.1 ng (ITEQ)/ Nm^3) plant is presented in **Table A2.3**. This is a standard profile derived by HMIP, one of the predecessors of the Environment Agency. **Table A2.4** presents the congener profile pro-rated for the *Worst Case* emissions scenario.

Table A2.3 Base Case PCDD/F Congener Profile [(a)]

Congener	Annual Mean Emission Concentration (non I-TEQ ng Nm^{-3}) [(b)(c)]	I-TEF [(b)]	Annual Mean Emission Concentration (ng I-TEQ Nm^{-3}) [(b)]
2,3,7,8-TCDD	0.0031	1.000	0.0031
1,2,3,7,8-PeCDD	0.0245	0.500	0.0123
1,2,3,4,7,8-HxCDD	0.0287	0.100	0.0029
1,2,3,7,8,9-HxCDD	0.0205	0.100	0.0021
1,2,3,6,7,8-HxCDD	0.0258	0.100	0.0026
1,2,3,4,6,7,8-HpCDD	0.1704	0.010	0.0017
OCDD	0.4042	0.001	0.0004
2,3,7,8-TCDF	0.027	0.100	0.0028
2,3,4,7,8-PeCDF	0.0535	0.500	0.0268
1,2,3,7,8-PeCDF	0.0277	0.050	0.0014
1,2,3,4,7,8-HxCDF	0.2179	0.100	0.0218
1,2,3,7,8,9-HxCDF	0.0042	0.100	0.0004
1,2,3,6,7,8-HxCDF	0.0807	0.100	0.0081
2,3,4,6,7,8-HxCDF	0.0871	0.100	0.0087
1,2,3,4,6,7,8-HpCDF	0.4395	0.010	0.0044
1,2,3,4,7,8,9-HpCDF	0.0429	0.010	0.0004
OCDF	0.3566	0.001	0.0004
Total (ng I-TEQ Nm^{-3}) [(c)]			**0.100**

(a) Congener profile from *Table 7.2a* DOE (1996) **Risk Assessment of Dioxin Releases from Municipal Waste Incineration Processes** Contract No. HMIP/CPR2/41/1/181.

(b) I-TEF is the international toxic equivalent factor. 2,3,7,8-TCDD the most toxic of the congeners is allocated a toxicity of 1.0. The toxicities of the other congeners are therefore related to the toxicity of 2,3,7,8-TCDD and by application of the I-TEF to the measured emission concentrations the international toxic equivalent (I-TEQ) can be determined. Hence the emissions of the different congeners stated above is equivalent (in terms of toxicity) to an emission concentration of 0.1 ng m^{-3} of 2,3,7,8-TCDD.

(c) Corrected for: Temperature; 273 K; Pressure; 101.3 kPa (1 atm); dry; 11% v/v O_2

Table A2.4 *Worst Case* PCDD/F Congener Profile

Congener	Annual Mean Emission Concentration (ng (I-TEQ) Nm^{-3})
2,3,7,8-TCDD	0.00520
1,2,3,7,8-PeCDD	0.02055
1,2,3,4,7,8-HxCDD	0.00481
1,2,3,7,8,9-HxCDD	0.00433
1,2,3,6,7,8-HxCDD	0.00344
1,2,3,4,6,7,8-HpCDD	0.00286
OCDD	0.00068
2,3,7,8-TCDF	0.00465
2,3,4,7,8-PeCDF	0.00232
1,2,3,7,8-PeCDF	0.04487
1,2,3,4,7,8-HxCDF	0.03655
1,2,3,7,8,9-HxCDF	0.00070
1,2,3,6,7,8-HxCDF	0.01354
2,3,4,6,7,8-HxCDF	0.01461
1,2,3,4,6,7,8-HpCDF	0.00737
1,2,3,4,7,8,9-HpCDF	0.00072
OCDF	0.00060
Total (ng I-TEQ Nm^{-3})	**0.1678**

A2.4 ESTIMATION OF DOSES

Exposure of an individual to a chemical may occur either by inhalation, oral intake (including food, water and soil), or where the chemical is absorbed through the skin (via water or soil). Of interest is the total dose of the chemical received by the individual through these three routes, and the model has been developed to estimate the dose at the point of entry into the body, often referred to as the external dose.

Exposure to PCDD/Fs is a function of the estimated concentration of the substance in the environmental media with which individuals may come into contact (*i.e.* exposure point concentrations) and the duration of contact. Exposure equations have been developed which combine exposure factors (*eg* exposure duration, frequency and medium intake rate) and exposure point concentrations. The dose equations therefore facilitate estimation of the received dose and are clearly dependent on the route of exposure, *i.e.* ingestion, inhalation and dermal contact. Detailed inputs to and outputs from the HMIP model are given in Attachment 1.

A3. EXPOSURE ASSESSMENT

A3.1 INTRODUCTION

Uptake of PCDD/Fs has been based on the maximum of the five annual mean ground level concentrations predicted to arise as a result of emissions from the proposed facility (*i.e.* the modelling estimated five maximum annual means based on the five met years 2012-2016, the value used was the maximum of these five values) for the *Worst Case* emissions scenario (See *Section A2.3* for further explanation).

Intakes have been calculated for an adult HMEI, assuming that HMEI is exposed for a total of 30 years (constituted of the likely lifetime of the facility (20-25 years) plus a period (5-10 years) to allow for the persistence of the compounds in the environment after the facility has ceased operation). The assessment assumes that the exposure is the same throughout this period of 30 years which is an overestimation as once the facility ceases operation the presence of the compounds resulting from the facility will decrease). However, it should be stressed that the calculations for the HMEI represents a worst case exposure assumption, leading to what might be regarded as an absolute upper limit of PCDD/F intake.

In order to predict the health effects of PCDD/F emissions from the proposed facility, the calculated intakes have been compared to the World Health Organization (WHO) Tolerable Daily Intake (TDI) and the UK COT (see *Section A3.2*).

The calculations presented represent the incremental intake from the operation of the proposed facility, operating at maximum capacity and emitting pollutants at the likely maximum permitted rates for most of the year but at much higher (x100) rates for 60 hours per year (*Worst Case* scenario).

A3.2 ASSESSMENT CRITERIA

A3.2.1 PCDD/Fs

International and national bodies have studied the effects of PCDDs/Fs on animals and humans and proposed a variety of metrics by which to evaluate impact or exposure to these compounds. The science is accepted as complex and the effects of relatively low exposures tend to take decades to show up in epidemiological studies. For this reason a precautionary approach is taken by these bodies and the largest observed effects on humans at the lowest doses are taken into account. Several bodies based their proposals on non-carcinogenic effects such as the development of the reproductive systems of male foetuses via the maternal body burden.

At the latest World Health Organisation (WHO) expert meeting (held in 2001) a revised Provisional Tolerable Monthly Intake (PTMI) of 70 pg I-TEQ/kg (body

weight (bw))/month was proposed(1). This supersedes the previous TDIs proposed.

The USEPA(2) have proposed a no-effect level / reference dose (RfD) of 7 x 10^{-10} mg/kg (body weight)/day.

The UK Committee on Toxicity (COT, 2001)(3) also proposed a TDI of 2 pg I-TEQ/kg(body weight)/day.

The background intake of PCDD/Fs for an adult from the ingestion of food products has been reducing significantly over the past two decades. When the HRA method was devised the Ministry of Agriculture, Fisheries and Foods (MAFF)(4) estimated annual food ingestion doses to be 69 pg I-TEQ/day in 1992 (240 pg I-TEQ/day in 1982).

COT (6) estimated intakes are 1.8 pg I-TEQ/kg(bw)/day for the average adult.

A summary of the various tolerable intakes/background estimates is given in the table below and to enable comparison have been converted to the same units as used by the WHO.

Table A3.1 Summary of Assessment Criteria

Organisation	Metric	Proposed Value	WHO Units(a)
WHO	Provisional Tolerable Monthly Intake	70 pg I-TEQ/ kg/ month	70 pg I-TEQ/ kg(bw)/month
USEPA	Mean daily reference dose (no effect level)	7 x 10^{-10} mg/kg (bw)/day	21 pg I-TEQ/kg (bw)/month
UK COT	Tolerable daily intake	2 pg I-TEQ/kg(bw)/day	60 pg I-TEQ/kg (bw)/month
UK Intake	Per person in 1982	240 pg I-TEQ/day	103 pg I-TEQ/kg (bw)/month
UK Intake	Per person in 1992	69 pg I-TEQ/day	30 pg I-TEQ/kg (bw)/month
UK Intake	Average consumer	1.8 pg I-TEQ/kg(bw)/day	56 pg I-TEQ/kg (bw)/month
(a) Approximate conversion based on 30 day month, 70kg / adult			

A3.3 ESTIMATED DOSES

The total intake of PCDD/Fs as a result of emissions from the proposed facility for the two scenarios assessed, are presented in the following tables.

(1) WHO (2010) **Fact Sheet 225 Dioxins and Their Effects on Human Health**
www.who.int/mediacentre/factsheets/fs225/en/ (accessed March 2013)
(2) USEPA, **Integrated Risk Information System** (IRIS) www.epa.gov/iris/subst/1024.htm (accessed March 2013)
(3) UK COT (2001) http://cot.food.gov.uk/pdfs/cot-diox-full.pdf (accessed March 2013)
(4) http://archive.food.gov.uk/maff/archive/food/infsheet/1995/no71/table1.htm (accessed March 2013)

Table A3.2 Estimated Total PCDD/Fs Intake (pg I-TEQ/kg (body weight)/month) including the Contribution of Inhalation and Ingestion for a HMEI Presented in Units for Comparison to the WHO PTMI

Scenario	Inhalation	Ingestion	Total Intake
Worst Case	0.011	1.392	1.403
WHO PTMI	**-**	**-**	**70**

Table A3.3 Estimated Total PCDD/Fs Intake (pg I-TEQ/kg (body weight)/day) including the Contribution of Inhalation and Ingestion for a HMEI Presented in Units for Comparison to the UK COT TDI

Scenario	Inhalation	Ingestion	Total Intake
Worst Case	0.0004	0.0464	0.0468
UK COT TDI	**-**	**-**	**2**

A3.4 **ASSESSMENT OF HEALTH EFFECTS**

Even for the extremely conservative exposure assumptions adopted for the HMEI, the predicted incremental intake is estimated to be small for both the *Worst Case* in comparison to the TDI and typical UK dietary intakes.

Table A3.4 shows the estimated intake (see **Table A3.3**) as a percentage of the assessment criteria for the three scenarios considered.

Table A3.4 Estimated Total PCDD/F (Dioxin/Furan) Intake as Percentage of Assessment Criteria (%)

Assessment Criteria	*Worst Case* Scenario
WHO (PTMI)	2.0%
US EPA (RfD)	6.7%
UK COT (TDI)	2.3%
UK Average intake (COT, 2001)	2.6%

The assessment demonstrates that the Hypothetical Maximum Exposed Individual (HMEI) is not subject to a significant additional risk arising from exposures via both inhalation and the ingestion of foods.

A4. POLYCHLORINATED BIPHENYLS (PCBS)

A4.1 BACKGROUND

The HMIP methodology (1996) used for the assessment of human health risks arising from emissions of dioxins and furans does not include pathways or factors to enable PCBs to be included in the assessment.

The EA (1) have advised that the US Environmental Protection Agency (EPA) Human Health Risk Assessment Protocol (HHRAP) indicates that the primary intake route for humans for PCBs is via the fish route. The EA advise that if the dietary fish route can be screened out of the assessment (e.g. because the location of the plant is not sited close to an area where fishing is a common source of food) the consideration of PCB intake to humans can also be excluded from the assessment. For this facility this is the case and so modelling of PCBs in the food chain is not required (2).

A4.2 EMISSIONS OF PCBS

It is also possible to examine the likely effects of including PCBs in the overall assessment, without having to apply the detailed and complex HHRAP methodology. The EA also provided information relating to emissions of PCBs (personal communication 2014). They state that emissions from 44 measurements taken by operators of 24 municipal waste incinerators (MWIs) between 2008 and 2010 resulted in a mean stack gas PCB concentration of 0.0026 ng [TEQ] Nm^{-3} (range of 0.000056 to 0.0092 ng [TEQ] Nm^{-3}).

Taking the mean value (0.0026 ng [TEQ] Nm^{-3}) as a representative emission rate for PCBs when the plant is operating within its dioxin/furan emission limit of 0.1 ng [TEQ] Nm^{-3} would give an emission rate under the *Worst Case* emission scenario of:

0.0044 ng [TEQ] Nm^{-3} (i.e. 0.0026*0.1678/0.1 ng [TEQ] Nm^{-3}).

This can be added to the assumed emission concentration of dioxins/furans of 0.1678 ng [TEQ] Nm^{-3} (*Worst Case* scenario) giving an emission rate for dioxins/furans plus PCB-like dioxins of:

0.1722 ng [TEQ] Nm^{-3} (i.e. 0.0044+0.1678 ng [TEQ] Nm^{-3}).

A4.3 FOOD CHAIN ASSESSMENT OF PCBS

Assuming that the behaviour of PCBs in the food chain is broadly similar to dioxins and furans (some PCBs are known to be dioxin-like in their behaviour) the results from the dioxin and furan assessment can be pro-rated to give an indication of what the possible impact would be on the HMEI.

(1) Personal communication, Adam Dawson (Environment Agency) and Carl Hawkings (ADM Ltd), 28 April 2014.
(2) Fish ingestion has been included in the assessment of dioxins and furans because the methodology is based on the HMEI (hypothetically maximum exposed individual).

UK COT states that PCBs, if relevant should be included in the tolerable daily intake (COT-TDI), used for the dioxin assessment, of 2 pg [TEQ] kg [BW]$^{-1}$ day^{-1} as a lifetime exposure.

The following table shows percentage the plant would contribute at most to the COT-TDI as a result of emissions of PCDDs/Fs, PCBs and the total.

Table A4.1 Estimated Total PCDD/Fs and PCBs Intake (pg I-TEQ/kg (body weight)/day) including the Contribution of Inhalation and Ingestion for a HMEI Presented as a Percentage of the UK COT TDI

Scenario	PCDD/Fs	PCBs	PCDD/Fs+PCBs
Worst Case	2.3%	0.1%	2.4%

Adding PCBs to the calculation results in a negligible increase and makes the very pessimistic assumption that all fish consumed by the individual (HMEI) comes from water bodies (sea and freshwater) at the point of maximum air quality impact.

A4.4 ASSESSMENT OF AMBIENT CONCENTRATIONS OF PCBS

The air modelling estimated that the *Worst Case s*cenario maximum ground level concentration, (GLC) of dioxins/furans ranged (depending on the year of meteorological data used in the modelling) between 0.7669 and 1.2314 fg m^{-3} (mean = 1.0013 fg m^{-3}).

Based on the likely emission rate of dioxin-like PCBs this GLC (for dioxins/furans) can be prorated to estimate the maximum GLC of PCBs, i.e.: 0.0199-0.0320 fg m^{-3} (mean = 0.0260 fg m^{-3}).

This is insignificant compared to the long term EAL of 200,000,000 fg m^{-3} (stated as 0.2 µg m^{-3} in H1 Guidance Annex F(1) but converted to fg for ease of comparison).

(3) www.gov.uk/government/uploads/system/uploads/attachment_data/file/298239/geho0410bsil-e-e.pdf

A5. HEALTH RISK ASSESSMENT - SUMMARY AND CONCLUSIONS

The possible impacts on human health arising from PCDD/F emitted from the proposed facility have been assessed under the *Worst Case* scenario. The proposed facility is assumed to be continually operating at maximum permitted emission limits for most of the year and at one hundred (100) times these limits for 60 (*Worst Case* scenario) hours per year. These predicted effects are also for the location at which **maximum** ground level concentrations arising from the facility's emissions occur and therefore estimates of the magnitude or risk of any effects at other locations will be lower than these. Further, the estimates apply to a Hypothetical Maximum Exposed Individual (HMEI) who is exposed to dioxins/furans for 30 years at this location and who eats food only from produce grown locally.

The study also assessed exposures via the ***ingestion*** of food. The possible impact of dioxins is discussed by comparison with a range of tolerability criteria. The assessment shows that for the HMEI the intake would equate to 2.0%-6.7% of the tolerability criteria (the range derives from using the criteria from the three organisations). The intake would also equate to 2.6% (*Worst Case* scenario) of the current daily intake of an average adult individual.

The risk assessment methodology used in this assessment has been structured so as to create worst case estimates of risk. A number of features in the methodology give rise to this degree of conservatism, including:

- The proposed facility continually operates at the maximum permissible air emissions limits for most of the year and 100 times these limits for 60 hours (*Worst Case* scenario). In practice this is unlikely to be the case and actual emissions would be lower than those for which the assessment was conducted.

- Doses of contaminants are calculated for a hypothetical maximum exposed individual (HMEI) who lives at the point of maximum impact and consumes all of his/her animal, fish, dairy, vegetable and cereal products from this point.

- Modelling parameters are such that they will tend to over-estimate the levels of substances in foods.

The methodology for dioxins and furans has been adapted to estimate the likely risk that may arise from emissions of polychlorinated biphenyls (PCBs) emitted from the facility.

The assessment demonstrates that the Hypothetical Maximum Exposed Individual (HMEI) is not subject to a significant additional risk arising from exposures to emissions of dioxins, furans or PCBs via both inhalation and the ingestion of foods.

Attachment 1

HMIP Dioxins/Furans Model
Detailed Inputs and Outputs: *Worst Case* Emissions Scenario

Typical Exposure

Northacre Renewable Energy (P1418) - Worst Case Scenario

Population Subgroup: Adult MEI (Increment)

Constituent	INH Intake via Inhalation	DERM Intake via Dermal Contact	INGsoil Intake via Soil Ingestion	INGwater Intake via Water Ingestion	INGplant Intake via Plant Ingestion	INGanimal Intake via Meat/meat prod	INGmilk Intake via eggs/ Milk/dairy prod	INGtotal Total Intake via Ingestion	INTAKEtotal Total Intake via all pathways
TEQ (ng/kg-day)	3.52E-07	0.00E+00	0.00E+00	0.00E+00	1.52E-05	3.13E-05			
TEQ (ng/day)	2.46E-05	0.00E+00	0.00E+00	0.00E+00	1.06E-03	2.19E-03			
TEQ (pg/day)	2.46E-02	0.00E+00	0.00E+00	0.00E+00	1.06E+00	1.62E+00	*5.66E-01*	3.25E+00	3.27E+00

Media concentrations

TEQ Total airborne concentration (µg/m3)	1.23E-09
TEQ Soil Concentration (ng/kg)	7.40E-02
TEQ Waterbody concentration (ng/L)	1.10E-06

Inhalation pathway-specific parameters

	Indoors	Outdoors
INHair (inhalation rate, m3/hr)	0.000	0.833
ET (exposure time, hr/day)	0	24

Dermal pathway-specific parameters

Adherence factor (mg/cm2-event)	0
ABS (Absorption factor)*	0.03
Exposed surface area (cm2)	5000

	Mean Annual Rainfall (mm/year)
Soil ingestion pathway-specific parameters	
INGsoil (mg/day)	0
BIO (Bioavaillability)	1
Exposure frequency for soil ingestion (day/yr)	365
	814.2

Water ingestion pathway-specific parameters

INGwater (L/day)	0

General Exposure Parameters

Exposure frequency (day/yr)	365
Exposure duration (yr)	30
Body weight (kg)	70
Averaging time - carcinogenic (day)	10,950
Ratio of MEI to resident air concentration	1.00
Ratio of MEI to water air concentration	1.00

Plant ingestion pathway-specific parameters

	Cp (Consumption rate of plants, g FW/kg-day)	P (TEQ plant conc., ng/kg FW)	Fraction plants locally grown	Intake pg/day
Potatoes	1.580	3.53E-05	1.00	3.90E-03
Leafy Veg	3.000	6.01E-04	1.00	1.26E-01
Legumes	0.260	7.91E-04	1.00	1.44E-02
Root Vegetables	0.380	3.21E-05	1.00	8.54E-04
Fruit	1.830	9.33E-04	1.00	1.19E-01
Fruit Vegetables	1.070	9.62E-04	1.00	7.21E-02
Cereals products	3.300	3.14E-03	1.00	7.24E-01
Total Plants				**1.06E+00**

Animal tissue ingestion pathway-specific parameters

	Ca (Consumption rate of an. tissue, g FW/kg-day)	A (TEQ animal tissue concen., ng/kg FW)	Fraction animals locally raised	Intake pg/day
Beef	0.530	2.16E-03	1.00	8.03E-02
Offal	0.000	2.16E-02	1.00	0.00E+00
Lamb	0.120	6.58E-03	1.00	5.52E-02
Pork	0.640	1.23E-03	1.00	5.51E-02
Poultry	0.530	8.36E-04	1.00	3.10E-02
Milk	3.400	1.09E-03	1.00	2.60E-01
Eggs	0.280	8.88E-04	1.00	1.74E-02
Dairy Products	0.700	5.89E-03	1.00	2.89E-01
Meat Products	0.000	2.45E-03	1.00	0.00E+00
Fats, Oils, Cereals	1.000	1.86E-02	1.00	1.30E+00
Fish	1.100	1.25E-03	1.00	9.61E-02
Total Animals				**2.19E+00**
			Total (Animals + Plants)	**3.25E+00**

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National Planning Policy for Waste

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National Planning Policy for Waste

Introduction

1. The Waste Management Plan for England[1] sets out the Government's ambition to work towards a more sustainable and efficient approach to resource use and management. Positive planning plays a pivotal role in delivering this country's waste ambitions through:

- delivery of sustainable development and resource efficiency, including provision of modern infrastructure, local employment opportunities and wider climate change benefits, by driving waste management up the waste hierarchy (see Appendix A);
- ensuring that waste management is considered alongside other spatial planning concerns, such as housing and transport, recognising the positive contribution that waste management can make to the development of sustainable communities;
- providing a framework in which communities and businesses are engaged with and take more responsibility for their own waste, including by enabling waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle[2];
- helping to secure the re-use, recovery or disposal of waste without endangering human health and without harming the environment; and
- ensuring the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste.

This document sets out detailed waste planning policies. It should be read in conjunction with the National Planning Policy Framework[3], the Waste Management Plan for England and National Policy Statements for Waste Water and Hazardous Waste, or any successor documents. All local planning authorities should have regard to its policies when discharging their responsibilities to the extent that they are appropriate to waste management.

Using a proportionate evidence base

2. In preparing their Local Plans, waste planning authorities should, to the extent appropriate to their responsibilities:

- ensure that the planned provision of new capacity and its spatial distribution is based on robust analysis of best available data and information, and an appraisal of options. Spurious precision should be avoided;

[1] http://www.gov.uk/government/publications/waste-management-plan-for-england
[2] See Schedule 1, Part 1, paragraph 4 of The Waste (England and Wales) Regulations 2011 (S.I 2011/988)
[3] https://www.gov.uk/government/publications/national-planning-policy-framework--2

- work jointly and collaboratively with other planning authorities to collect and share data and information on waste arisings, and take account of:

  (i) waste arisings across neighbouring waste planning authority areas;

  (ii) any waste management requirement identified nationally, including the Government's latest advice on forecasts of waste arisings and the proportion of waste that can be recycled; and

- ensure that the need for waste management facilities is considered alongside other spatial planning concerns, recognising the positive contribution that waste management can bring to the development of sustainable communities.

Identify need for waste management facilities

3. Waste planning authorities should prepare Local Plans which identify sufficient opportunities to meet the identified needs of their area for the management of waste streams. In preparing Local Plans, waste planning authorities should:

- undertake early and meaningful engagement with local communities so that plans, as far as possible, reflect a collective vision and set of agreed priorities when planning for sustainable waste management, recognising that proposals for waste management facilities such as incinerators can be controversial;

- drive waste management up the waste hierarchy (Appendix A), recognising the need for a mix of types and scale of facilities, and that adequate provision must be made for waste disposal;

- in particular, identify the tonnages and percentages of municipal, and commercial and industrial, waste requiring different types of management in their area over the period of the plan (In London, waste planning authorities should have regard to their apportionments set out in the London Plan when preparing their plans);

- consider the need for additional waste management capacity of more than local significance and reflect any requirement for waste management facilities identified nationally;

- take into account any need for waste management, including for disposal of the residues from treated wastes, arising in more than one waste planning authority area but where only a limited number of facilities would be required;

- work collaboratively in groups with other waste planning authorities, and in two-tier areas with district authorities, through the statutory duty to cooperate, to provide a suitable network of facilities to deliver sustainable waste management;

- consider the extent to which the capacity of existing operational facilities would satisfy any identified need.

Identifying suitable sites and areas

4. Waste planning authorities should identify, in their Local Plans, sites and/or areas for new or enhanced waste management facilities in appropriate locations. In preparing their plans, waste planning authorities should:

- identify the broad type or types of waste management facility that would be appropriately located on the allocated site or in the allocated area in line with the waste hierarchy, taking care to avoid stifling innovation (Appendix A);

- plan for the disposal of waste and the recovery of mixed municipal waste in line with the proximity principle, recognising that new facilities will need to serve catchment areas large enough to secure the economic viability of the plant;

- consider opportunities for on-site management of waste where it arises;

- consider a broad range of locations including industrial sites, looking for opportunities to co-locate waste management facilities together and with complementary activities. Where a low carbon energy recovery facility is considered as an appropriate type of development, waste planning authorities should consider the suitable siting of such facilities to enable the utilisation of the heat produced as an energy source in close proximity to suitable potential heat customers;

- give priority to the re-use of previously-developed land, sites identified for employment uses, and redundant agricultural and forestry buildings and their curtilages.

5. Waste planning authorities should assess the suitability of sites and/or areas for new or enhanced waste management facilities against each of the following criteria:

- the extent to which the site or area will support the other policies set out in this document;

- physical and environmental constraints on development, including existing and proposed neighbouring land uses, and having regard to the factors in Appendix B to the appropriate level of detail needed to prepare the Local Plan;

- the capacity of existing and potential transport infrastructure to support the sustainable movement of waste, and products arising from resource recovery, seeking when practicable and beneficial to use modes other than road transport; and

- the cumulative impact of existing and proposed waste disposal facilities on the well-being of the local community, including any significant adverse impacts on environmental quality, social cohesion and inclusion or economic potential.

6. Green Belts have special protection in respect to development. In preparing Local Plans, waste planning authorities, including by working collaboratively with other

planning authorities, should first look for suitable sites and areas outside the Green Belt for waste management facilities that, if located in the Green Belt, would be inappropriate development. Local planning authorities should recognise the particular locational needs of some types of waste management facilities when preparing their Local Plan.

Determining planning applications

7. When determining waste planning applications, waste planning authorities should:

- only expect applicants to demonstrate the quantitative or market need for new or enhanced waste management facilities where proposals are not consistent with an up-to-date Local Plan. In such cases, waste planning authorities should consider the extent to which the capacity of existing operational facilities would satisfy any identified need;

- recognise that proposals for waste management facilities such as incinerators that cut across up-to-date Local Plans reflecting the vision and aspiration of local communities can give rise to justifiable frustration, and expect applicants to demonstrate that waste disposal facilities not in line with the Local Plan, will not undermine the objectives of the Local Plan through prejudicing movement up the waste hierarchy;

- consider the likely impact on the local environment and on amenity against the criteria set out in Appendix B and the locational implications of any advice on health from the relevant health bodies**.** Waste planning authorities should avoid carrying out their own detailed assessment of epidemiological and other health studies;

- ensure that waste management facilities in themselves are well-designed, so that they contribute positively to the character and quality of the area in which they are located;

- concern themselves with implementing the planning strategy in the Local Plan and not with the control of processes which are a matter for the pollution control authorities. Waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced;

- ensure that land raising or landfill sites are restored to beneficial after uses at the earliest opportunity and to high environmental standards through the application of appropriate conditions where necessary.

8. When determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

- the likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities;

- new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape. This includes providing adequate storage facilities at residential premises, for example by ensuring that there is sufficient and discrete provision for bins, to facilitate a high quality, comprehensive and frequent household collection service;

- the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.

Monitoring and Report

9. To inform the preparation of Local Plans and to inform the determination of planning applications as part of delivering sustainable waste management, local planning authorities should, to the extent appropriate to their responsibilities, monitor and report:

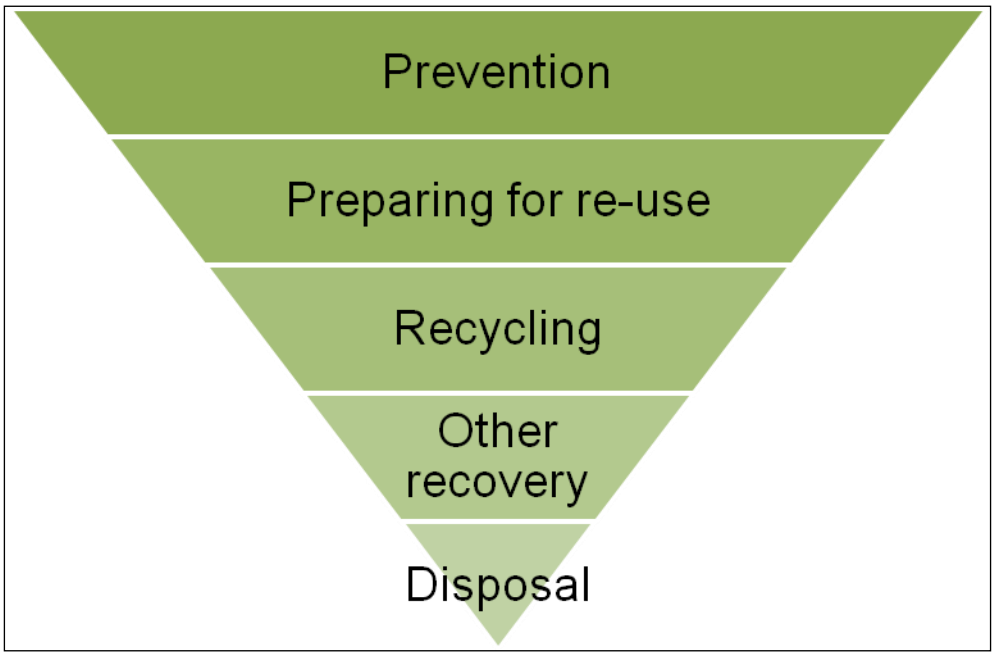
- take-up in allocated sites and areas;

- existing stock and changes in the stock of waste management facilities, and their capacity (including changes to capacity); waste arisings; and,

- the amounts of waste recycled, recovered or going for disposal.

Appendix A

The Waste Hierarchy



- the most effective environmental solution is often to reduce the generation of waste, including the re-use of products – *prevention*[4]
- products that have become waste can be checked, cleaned or repaired so that they can be re-used – *preparing for re-use*
- waste materials can be reprocessed into products, materials, or substances – *recycling*
- waste can serve a useful purpose by replacing other materials that would otherwise have been used – *other recovery*
- the least desirable solution where none of the above options is appropriate – *disposal*

[4] The full definition of each level of the waste hierarchy is set out in Article 3 of the revised Waste Framework Directive (2008/98/EC); see also the Waste Management Plan for England

Appendix B

Locational Criteria

In testing the suitability of sites and areas in the preparation of Local Plans and in determining planning applications, waste planning authorities should consider the factors below. They should also bear in mind the envisaged waste management facility in terms of type and scale.

a. protection of water quality and resources and flood risk management
Considerations will include the proximity of vulnerable surface and groundwater or aquifers. For landfill or land-raising, geological conditions and the behaviour of surface water and groundwater should be assessed both for the site under consideration and the surrounding area. The suitability of locations subject to flooding, with consequent issues relating to the management of potential risk posed to water quality from waste contamination, will also need particular care.

b. land instability
Locations, and/or the environs of locations, that are liable to be affected by land instability, will not normally be suitable for waste management facilities.

c. landscape and visual impacts
Considerations will include (i) the potential for design-led solutions to produce acceptable development which respects landscape character; (ii) the need to protect landscapes or designated areas of national importance (National Parks, the Broads, Areas of Outstanding Natural Beauty and Heritage Coasts) (iii) localised height restrictions.

d. nature conservation
Considerations will include any adverse effect on a site of international importance for nature conservation (Special Protection Areas, Special Areas of Conservation and RAMSAR Sites), a site with a nationally recognised designation (Sites of Special Scientific Interest, National Nature Reserves), Nature Improvement Areas and ecological networks and protected species.

e. conserving the historic environment
Considerations will include the potential effects on the significance of heritage assets, whether designated or not, including any contribution made by their setting.

f. traffic and access
Considerations will include the suitability of the road network and the extent to which access would require reliance on local roads, the rail network and transport links to ports.

g. air emissions, including dust
Considerations will include the proximity of sensitive receptors, including ecological as well as human receptors, and the extent to which adverse emissions can be controlled through the use of appropriate and well-maintained and managed equipment and vehicles.

h. odours
Considerations will include the proximity of sensitive receptors and the extent to which adverse odours can be controlled through the use of appropriate and well-maintained and managed equipment.

i. vermin and birds
Considerations will include the proximity of sensitive receptors. Some waste management facilities, especially landfills which accept putrescible waste, can attract vermin and birds. The numbers, and movements of some species of birds, may be influenced by the distribution of landfill sites. Where birds congregate in large numbers, they may be a major nuisance to people living nearby. They can also provide a hazard to aircraft at locations close to aerodromes or low flying areas. As part of the aerodrome safeguarding procedure (ODPM Circular 1/2003[5]) local planning authorities are required to consult aerodrome operators on proposed developments likely to attract birds. Consultation arrangements apply within safeguarded areas (which should be shown on the policies map in the Local Plan).

The primary aim is to guard against new or increased hazards caused by development. The most important types of development in this respect include facilities intended for the handling, compaction, treatment or disposal of household or commercial wastes.

j. noise, light and vibration
Considerations will include the proximity of sensitive receptors. The operation of large waste management facilities in particular can produce noise affecting both the inside and outside of buildings, including noise and vibration from goods vehicle traffic movements to and from a site. Intermittent and sustained operating noise may be a problem if not properly managed particularly if night-time working is involved. Potential light pollution aspects will also need to be considered.

k. litter
Litter can be a concern at some waste management facilities.

l. potential land use conflict
Likely proposed development in the vicinity of the location under consideration should be taken into account in considering site suitability and the envisaged waste management facility.

[5] Safeguarding aerodromes, technical sites and military explosives storage areas and on the application of the Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2002

Wiltshire Council
Where everybody matters

18/09473/WCM
Northacre Renewable Energy
Stephenson Road
Northacre Industrial Estate
Westbury
BA13 4WD

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REPORT FOR STRATEGIC COMMITTEE

Date of Meeting	23 January 2019
Application Number	18/09550/FUL
Site Address	Land at Brook Farm / adj Northacre Renewable Energy, Stephenson Road, Northacre Industrial Park, Westbury, BA13 4WD
Proposal	Landscaping and screening bund
Applicant	Northacre Renewable Energy Ltd
Town/Parish Council	WESTBURY
Electoral Division	WESTBURY WEST – Cllr Russell Hawker
Grid Ref	385757 151868
Type of application	Full Planning
Case Officer	Andrew Guest

Reason for the application being considered by Committee

The application is before the Committee because it is associated with planning application no. 18/09473/WCM for the Advanced Thermal Treatment Facility (previous agenda item).

1. Purpose of Report

The report assesses the merits of the proposal against the policies of the Development Plan and other material considerations leading to a recommendation, which is to grant planning permission subject to conditions.

2. Report Summary

This is a full planning application to construct a landscaping and screening bund. Although a standalone proposal, the intended purpose of the bund is to soften the effects of the Advanced Thermal Treatment (ATT) facility separately proposed at the adjacent Northacre Renewable Energy Facility site. It would be constructed using material excavated from that site.

The application site lies within the Westbury Civil Parish, with Dilton Marsh CP approximately 300m to the west.

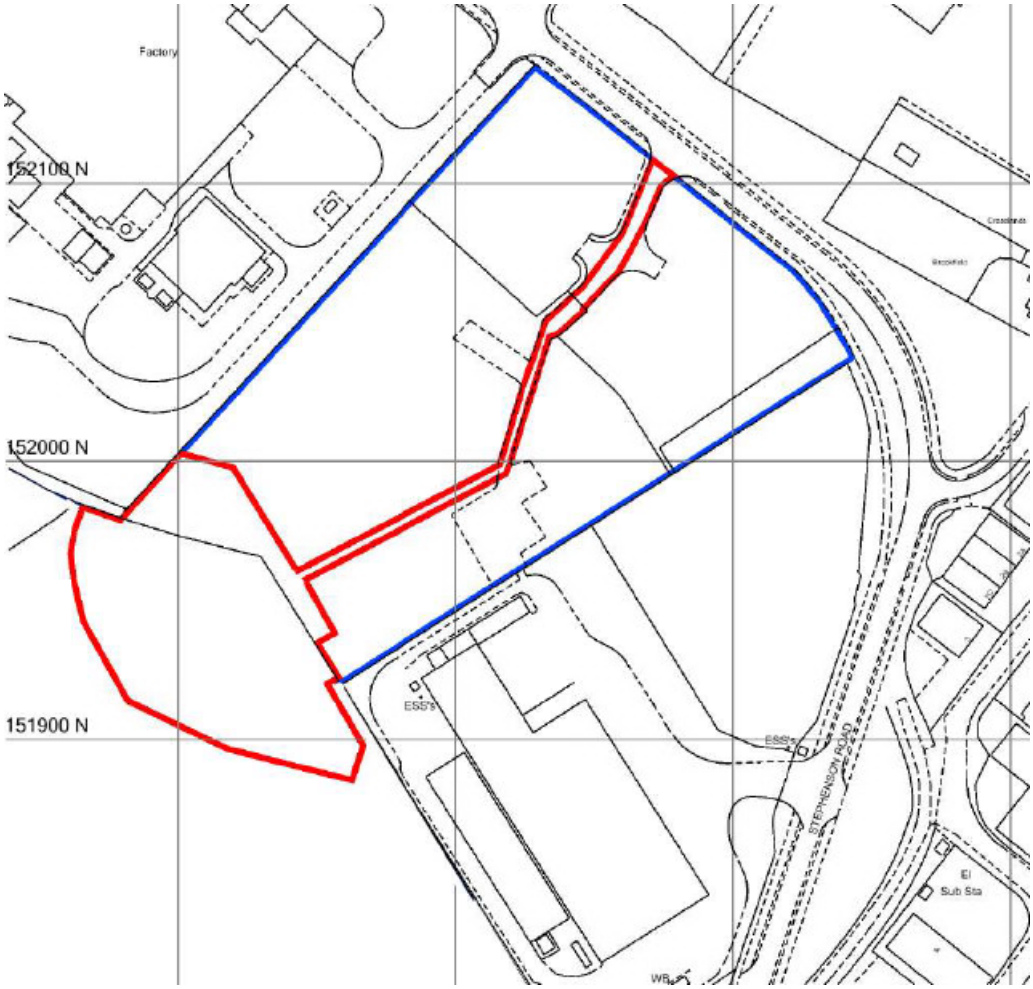
Westbury Town Council objects to the application; Adjoining Dilton Marsh Parish Council offers caveated ‘no objection’. Nearby Heywood PC makes ‘no comment’.

The application has generated representations from 9 interested parties - all objections.

3. Site Description

The application site is located on the north-west side of Westbury 'Market Town', partly within the existing Northacre Industrial Estate (which itself is part of a larger industrial area including the West Wilts Trading Estate (to the north) and the Brook Lane Trading Estate (to the south-east)), and partly within 'countryside'. For planning purposes the industrial estates are designated as a Principal Employment Area and the countryside is designated as an Employment Allocation (to be an extension to the Northacre Industrial Estate); the Northacre Industrial Estate and Employment Allocation are also an allocated Strategic Scale Waste Site.

The application site itself forms part of a larger land parcel within the control of the applicant. Within this parcel, and to the east of the application site, is the Northacre Resource Recovery Centre (RRC), currently supporting a 'mechanical biological treatment' (MBT) facility and an un-developed 'plot'. The un-developed plot has two planning permissions – firstly, for a vehicle depot and household recycling centre (HRC) (it is now not intended to implement the HRC); and secondly, for a 'waste transfer station' (WTS), enlarged depot and Welfare, Office and Workshop building (18/03366/WCM) (to be implemented shortly). The un-developed land to the immediate north-east has planning permission for an Advanced Thermal Treatment (ATT) facility (14/12003/WCM), and is the subject of the previous application on this agenda for a revised ATT (18/09473/WCM) *and* an appeal against the SPC's earlier refusal for a revised ATT (18/03816/WCM).

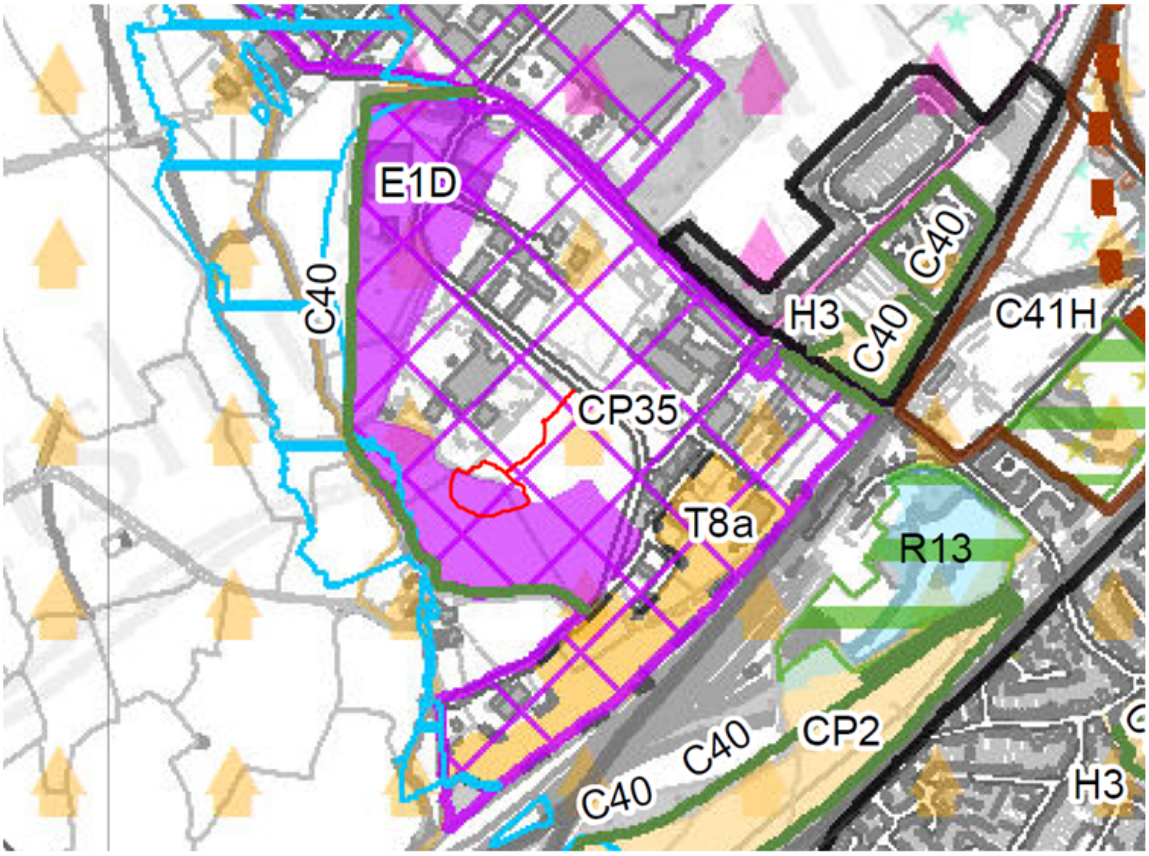


Red-edged Site Plan

To the immediate north of the application site is a large milk processing factory (Arla Dairies), with landscaping bunds in the adjacent fields. Further to the north and east of the site and the applicant's wider holding, and on the opposite side of Stephenson Road, are various other industrial/business units and uses and a sewage works, and a few remaining vacant plots awaiting new industrial/business uses, and two residential properties – Brookfield and Crosslands – fronting Brook Lane. To the west is open land, in part within the Employment Allocation and waste site allocation. Beyond this open land, c. 300m from the site, are two further residential properties – Brook Farm and Orchard House.

As set out above, for planning purposes the site and its close surroundings are designated as a Principal Employment Area and/or an Employment Allocation in the Wiltshire Core Strategy 2015. In addition, the Northacre Industrial Estate and the Employment Allocation is an allocated Strategic Scale Waste Site in the Wiltshire & Swindon Waste Site Allocations Local Plan 2013. To the west of the site – beyond Brook Farm and Orchard House – is open countryside and a Scheduled Monument ("medieval settlement and associated field systems").

For its larger part the application site is presently an open field with a gentle fall (of c. 5m overall) from its north-east side to its south-west side. A small part of the site lies within the ATT 'plot' referred to above, this including the access from Stephenson Road. A fence / gappy hedge and one or two small trees define the boundary between the field and the Employment Allocation.



Extract from Wiltshire Core Strategy Policies Map

[Red line – application site; Purple shading (E1D) – Employment Allocation;
Purple diamond hatching (CP35) – Principal Employment Areas; Orange shading – Rail Freight Facility]

4. Relevant Planning History

14/12003/WCM – *Advanced thermal treatment facility* – approved 23/09/15

This planning permission has not been built out but remains extant. Commencement of some elements in common with the current application is expected at end 2018 / early 2019.

14/12003/WCM – Approved General Layout Plan for ATT Facility

18/03816/WCM – *Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM* – refused 18/07/18

The single detailed reason for refusal is as follows:

The proposed development, by reason of its height, bulk and location on rising ground on the edge of the built-up area, would have an adverse impact on the appearance of the area. This would conflict with Core Policy 51 in the Wiltshire Core Strategy, which seeks to protect, conserve and enhance the visual amenity of the landscape.

18/09473/WCM – *Revision of the layout and design of Advanced Thermal Treatment facility permitted under consent 14/12003/WCM*

'Live' application, also on this agenda.

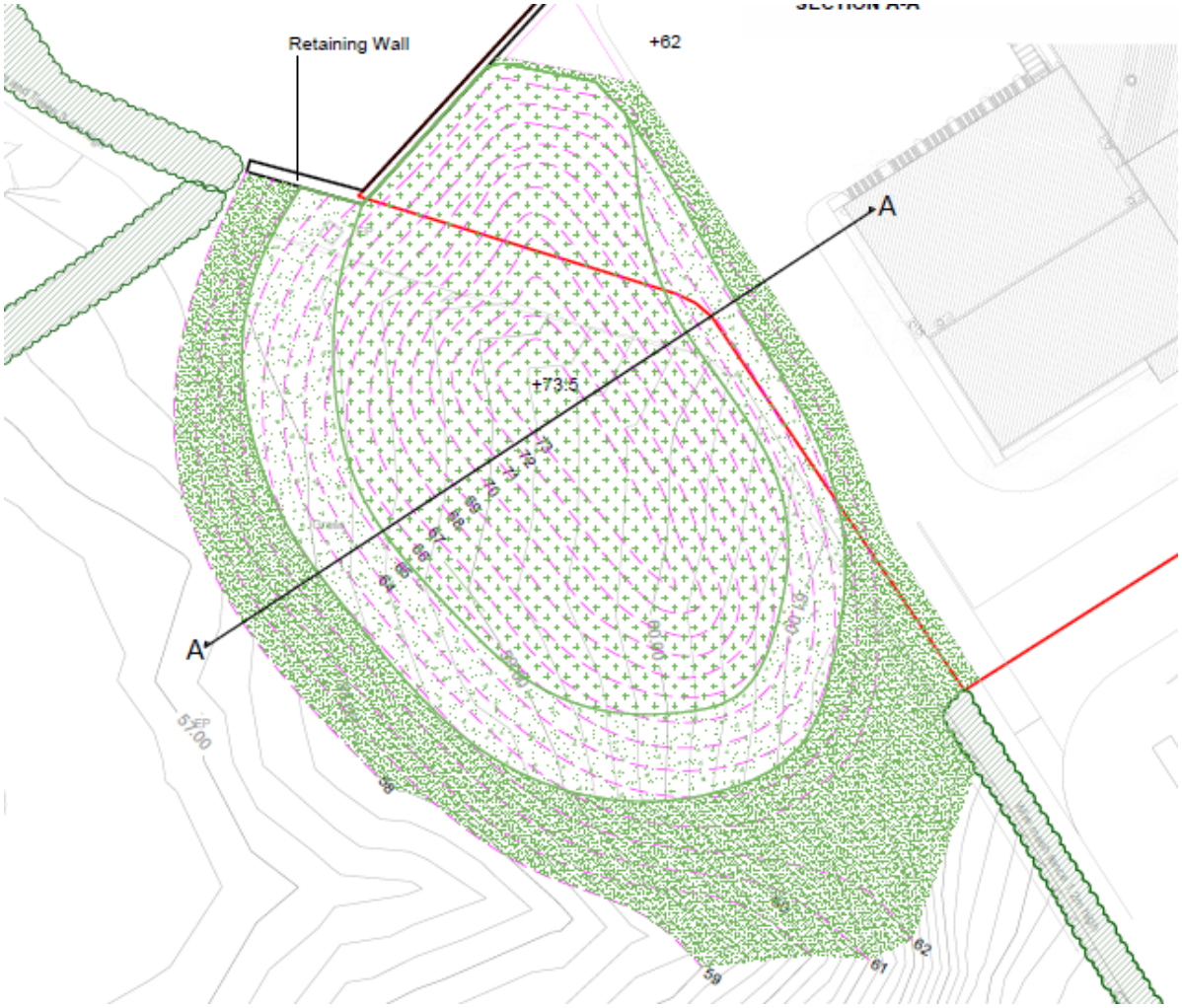
5. Proposal

The proposal is to erect a 'landscaping and screening bund'. The screening purpose of the bund would be to soften views of the ATT (as approved or as separately proposed) in views from the west. It would be planted primarily with trees and shrubs.

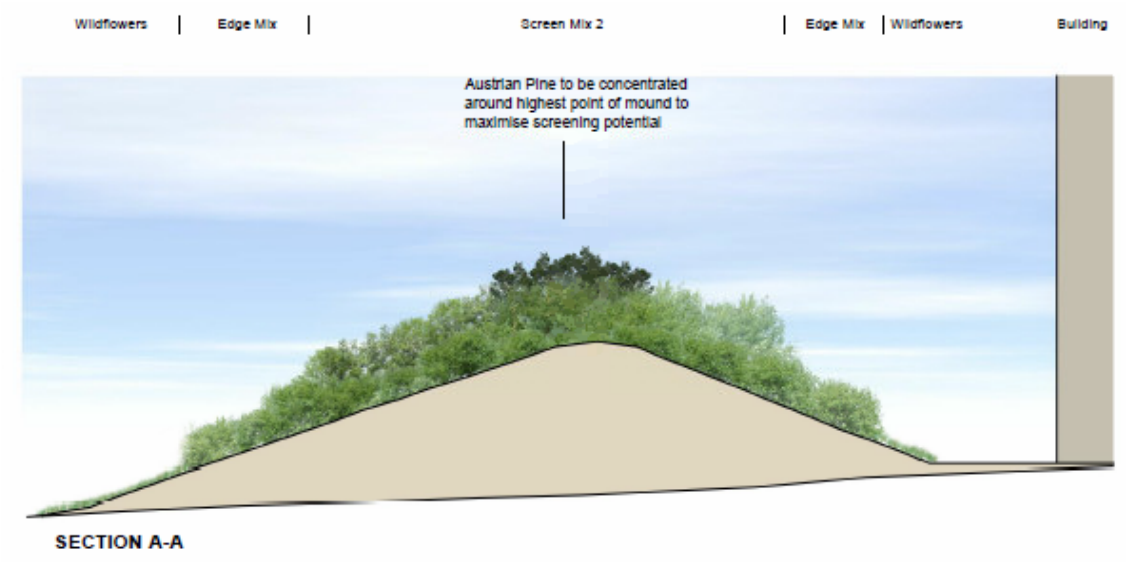
The bund would have maximum dimensions of c. 100m by 80m; its maximum height above existing levels would be c. 13-14m, although on all sides it would slope down and 'feather' into the original lie of the land. The site presently slopes, with a fall of c. 5m from its north-east side to its south-west side.

An approx. 100m length of the existing gappy hedge would be removed, but replaced by a comprehensive planting scheme across the entire bund.

The source of construction materials for the bund would be the ATT site where - in application no. 18/09473/WCM - it is proposed to level that site by cutting into its present slight incline (from east to west).



Proposed Bund – Plan



Proposed Bund – typical 'east-west' section

The Supporting Statement with the application says the following:

"1. Planning permission 14/12003/WCM has been granted for an Advanced Thermal Treatment (ATT) facility on land between Westbury Dairies and the Northacre Resource Recovery Centre (RRC). The design and layout of the ATT and its visual, landscape and heritage impact were fully assessed and found to be acceptable.

2. An application for revisions to the layout and design was submitted in April 2018 (ref 18/03816/WCM) and, despite being recommended for approval, was refused in July 2018 on the grounds that the "proposed development, by reason of its height, bulk and location on rising ground on the edge of the built-up area, would have an adverse impact on the appearance of the area. This would conflict with Core Policy 51 in the Wiltshire Core Strategy, which seeks to protect, conserve and enhance the visual amenity of the landscape."

3. An application relating to further revisions to the approved layout and design, reducing its height, volume and footprint from the refused proposals as well as reducing the site development level to further reduce the height of the development. …….

4. The Landscape and Visual Impact Assessment which accompanies that revised ATT application confirms that the development as proposed, and not considering the subject of this application, is acceptable in terms of the potential landscape and visual impact. This application for a screening bund on land at Brook Farm to the southwest offers enhanced mitigation to the proposals should it be approved.

5. Provision of the screen bund proposed in this application can assist with further reducing the degree of landscape and visual impact that is identified as well as providing a sustainable solution to the soils that will arise as a result of development of the ATT Facility. It is also noted that although no unacceptable impact from either noise or light has been identified in any of the previous applications, the bund will provide potential mitigation for both the houses at Brook Farm.

6. The development of the ATT facility will generate quantities of soil and clays in levelling the site ready for construction to begin, in creating foundations, roads ways and other engineering work on site. The proposal has been historically to haul surplus materials to a third-party site away from Westbury. However, with the proposal for the screen bund, these can be beneficially used without the HGV movements on the local roads associated with their removal.

7. The transport assessment of the revised ATT application has considered the impact of construction traffic and found it to be acceptable but if consent is granted for the bund, the HGV movements associated with soils removal can be eliminated. The bund is estimated to contain 45,000 cubic metres of soils and clays, representing around 3000 HGV loads or 6000 HGV movements.

……..

15. The materials will be carried from the construction area to the bund site in dumper vehicles and built into the bund using excavators and blade as necessary. The operator is wholly familiar with this process and will use appropriate measures such as profile boards to achieve the required design.

16. The primary developments on the Northacre ATT site will be subject to a Construction Environmental Management Plan, required by planning condition and construction of the bund will be subject to that agreed document.

17. The materials that will be used are simply the existing soils and clays of the Northacre Industrial Estate and there is no reason to consider that there would be any risk of pollution from relocating them. In any event the donor site has been subject to Site Investigation which recorded trace levels of metals, consistent with naturally occurring concentrations, no hydrocarbons and no inorganic compounds.

18. When the bund is complete, the next available planting season will be used to undertake both the seeding as well as the shrub and tree planting. Locally sourced planting will be used where possible. Planting will be subject to ongoing aftercare in line with that of the planting around the ATT and RRC facilities".

The application is accompanied by a Planning Statement, a Landscape and Visual Impact Assessment and a drainage report. Where relevant the application cross-references reports prepared for the standalone ATT application.

6. Planning Policy and Guidance

Wiltshire Core Strategy

Core Policy 32 – Spatial Strategy for the Westbury Community Area
Core Policy 50 – Biodiversity and Geodiversity
Core Policy 51 – Landscape
Core Policy 55 – Air Quality
Core Policy 57 – Ensuring High Quality Design & Place Shaping
Core Policy 58 – Ensuring the Conservation of the Historic Environment
Core Policy 60 – Sustainable Transport
Core Policy 61 – Transport and Development
Core Policy 62 – Development Impacts on the Transport Network
Core Policy 65 – Movement of Goods

National Planning Policy/Guidance

National Planning Policy Framework

7. Consultations

Westbury Town Council: Objection.

We object on the grounds that this is contrary to Core Policy 57; Design and landscaping. This proposal is out of sympathy and unsuitable for a rural setting.

Dilton Marsh Parish Council (nearby parish): No objection in principle.

The PC - *draws attention to Core Policy 50 in the following respects;*

- *100m of ancient hedgerow would need to be removed and a tree survey should therefore be carried out prior*
- *Some of the trees proposed for re-planting are not native to the area, as the application states*

Heywood Parish Council (nearby parish): No comment.

Wiltshire Council Highways: No objection.

Wiltshire Council Landscape: No objection.

Wiltshire Council Drainage: No objection.

The screening mound is in ZR1 [Flood Zone 1] *and not in an area at risk from storm water flooding for the 1 in 30/100 events.*

The submission indicates a proposal to drain some of the surface run off from the mound into the surface water system proposed for the adjacent (separate application) site, which in turn will then drain into the public storm water system – It should be noted that WW [Wessex Water] *normally state that no land drainage discharges are allowed in their sewers thus the indicated proposals may be an issue and need changing.*

Historic England: Do not wish to offer comments.

8. Representations

The application has been publicised by press advert, site notice and neighbour letters. Representations from 9 interested parties (all objections) have been received, summarised as follows:

- If principle of ATT facility unacceptable then this also unacceptable as essentially part of the same project. ATT would be an eyesore, and a screening bund won't change this; not possible to screen such a large development as the ATT.
- Bund un-natural in appearance.
- Loss of 100m length of hedgerow – harmful to landscape character and ecology (including wider wildlife networks and likely bat foraging area). No ecological survey/assessment or tree survey with the application.

- Proposed planting not suitable (non-native varieties – Austrian pine); better to just plant-up existing gappy hedge.
- Loss of Grade 3b agricultural land.
- Just an easy way for applicant to dispose of waste soil.
- Inadequate road infrastructure.
- Potential issues with flooding; unknown impacts on River Biss.
- Potential issues for archaeology.
- ATT inappropriate in this location – too close to Arla Dairies, homes, Westbury town; etc.; inadequate infrastructure.

9. Planning Considerations

The main issues to be considered in this case are firstly the principle of the proposal; and then, assuming the principle is accepted, the impact of the specific scheme on detailed matters, including landscape/visual amenity, traffic/highway safety, ecology, heritage assets, drainage and residential amenity.

9.1 Principle

The application site lies partly within the Northacre Industrial Estate and partly within 'countryside'. For planning purposes the industrial estate is within an allocated Principal Employment Area and the countryside is designated as an Employment Allocation; the Industrial Estate and Employment Allocation are also within an allocated Strategic Scale Waste Site.

The proposed bund, although not strictly an employment or waste use in itself, is not considered inappropriate in this context where landscaping is, and will be, a likely feature of future employment developments effectively allowed by the Employment Allocation. Accordingly, in this context the bund is considered to be acceptable development as a matter of principle. The relatively limited area taken up by the bund would not prejudice employment development elsewhere across the employment allocation which extends to some c. 3.5 ha.

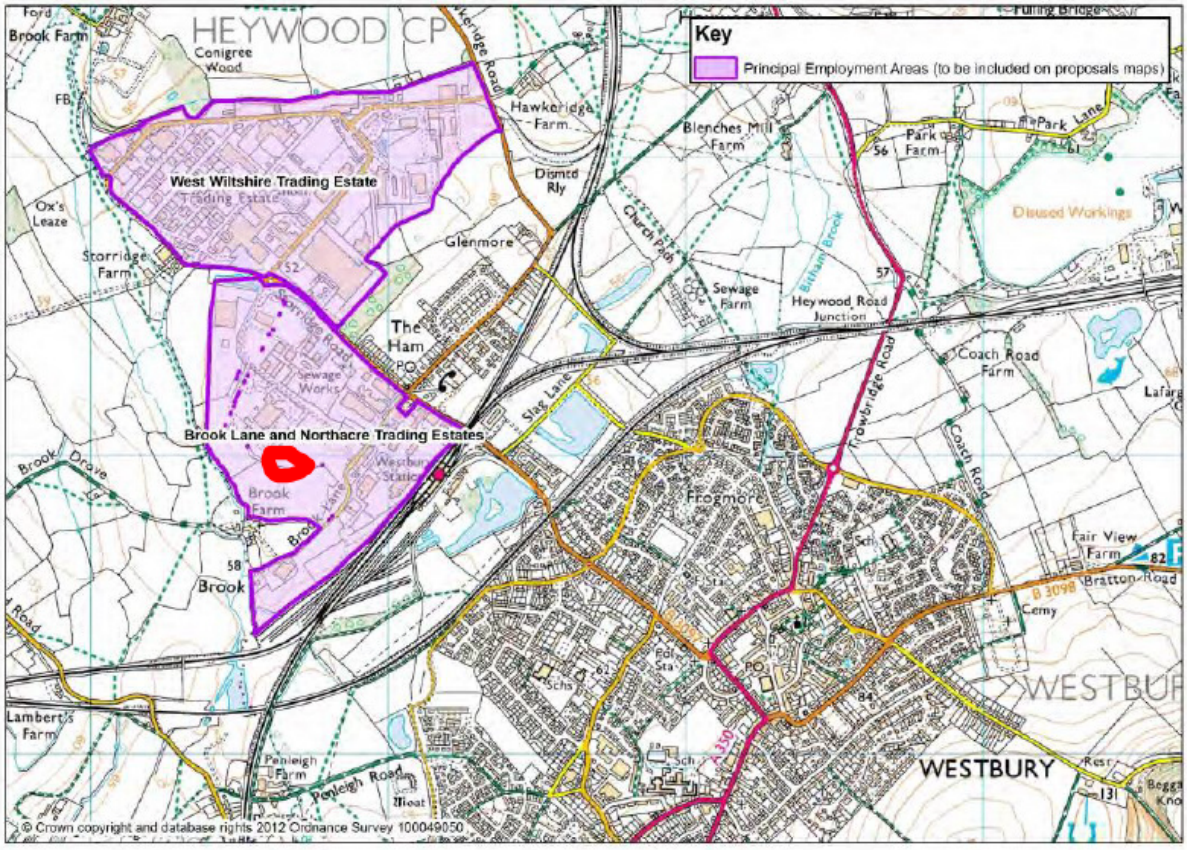
9.2 Landscape / visual amenity

Core Policy 51 ('Landscape') of the WCS states that new development should protect, conserve and where possible enhance landscape character, with any negative impacts mitigated as far as possible through sensitive design. The policy further states that proposals should be informed by and be sympathetic to the distinctive character areas identified in the relevant Landscape Character Assessment(s) and any other relevant assessments and studies; and proposals will need to demonstrate that the following matters in particular have been taken into account and landscape conserved and enhanced as appropriate:

- The separate identity of settlements and the transition between man-made and natural landscapes;
- Visually sensitive skylines, soils, geological and topographical features;
- Landscape features of cultural, historic and heritage value;
- Important views and visual amenity;
- Tranquillity and the need to protect against intrusion from light pollution, noise and motion; and
- Landscape functions including places to live, work, relax and recreate.

Core Policy 57 ('Ensuring high quality design and Place Shaping') provides more general development control standards, requiring new development to, in particular, respond positively to existing townscape and landscape features in terms of building layouts, built form, height, mass, scale, building lines, etc., to effectively integrate development into its setting. It also requires the retention and enhancement of existing important landscaping and natural features, including trees, hedgerows and watercourses.

Meanwhile, Core Policy 35 ('Existing Employment Sites') seeks to retain the defined Principal Employment Areas in employment uses, and supports renewal and intensification of employment uses thereon; and Core Policy 32 ('Spatial Strategy for the Westbury Community Area') allocates 3.8 ha of new employment land at Northacre Industrial Estate on land to its west side (that is, on and adjacent to the application site). These designations are illustrated on the following plan taken from the Landscape and Visual Impact Assessment (LVIA) with the planning application (application site added to this plan in red) …..



Extract from LVA: 'Site Location Plan' showing existing and allocated employment land (mauve). (Approximate position of application site in red)

Landscape and Visual Appraisal (LVA) –

The application is accompanied by a Landscape and Visual Appraisal (LVA) (October 2018) which assesses the impact of the proposal on landscape character and views. It does this by applying established LVA methodology - to define baseline conditions, and then to assess the landscape and visual effects of the proposal. It also considers mitigation as necessary, and the residual effects (that is, those effects likely to be reduced over time as a consequence of proposed tree planting or other factors).

The open countryside immediately adjoining the Northacre Renewable Energy site, in which the majority of the proposed screen mound would be located, falls within LCA E3, 'North Bradley Rolling Clay Lowland'. Its key characteristics are:

- Gently rolling farmland based on clay, with extensive views, including views on the chalk downland in the east and south;
- Distinct pattern of small to medium sized fields enclosed by mainly intact hedgerows with mature trees;
- Predominantly pasture with a few scattered ancient woodland blocks;
- Settlements consist of several villages and farmsteads linked by a dense network of mainly secondary roads and footpaths;
- Pylons as a dominant vertical element.

The relevant management and landscape objectives summarised in the Landscape Character Assessment are focussed on conserving this character area's landscape diversity and mitigating the ''the urbanising influence of large towns''. They include:

- Retention and management of the hedgerow network along with appropriate protection of the remaining mature hedgerow trees;
- Managing existing vegetation and planting new woodland to maintain the enclosed character and screen views of intrusive urban edges;
- Seeking of landscape enhancements from trading estate developments and screening of visual detractors;
- The introduction of new tree planting along watercourses using alder and willow;
- enhance woodland, cattle and horse pasture for bats.

Having regard to these baseline conditions and objectives, the LVA sums up the local landscape context of the application site as follows:

> *"As a result of the heavily developed and disturbed nature of the much of the area immediately surrounding to the east of the site, it is generally deemed overall, when the adjacent open countryside is taken into consideration, to be an Ordinary Landscape area (one which contains some features of visual value but generally lacks a coherent and aesthetically pleasing composition). Consequently it is considered to be of Medium Sensitivity[1] ….. with some potential to accommodate further change, as the estate expands westwards onto the adjacent agricultural land (assuming that buffer planting is incorporated, as outlined in the Core Strategy …)".*

Landscape effects –

Landscape character is defined in the LVA as "*the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place experienced in different areas of the landscape*". The degree to which a particular landscape type or area can accommodate change arising from a particular development, without detrimental effects on its character, will vary with:

- Existing land use;

[1] Medium Sensitivity defined as landscape areas with reasonably positive character, but with evidence of alteration or degradation of the character or features. Potentially tolerant of some change

- the pattern and scale of the landscape;
- visual enclosure / openness of views, and distribution of visual receptors;
- the scope for mitigation, which would be in character with the existing landscape.

Overall landscape impact is determined by combining the sensitivity of the landscape resource with the magnitude of landscape change.

In this case, and terms of the landscape effects of the proposed bund, the LVA concludes the following ….

"6.2. ….. the land on which the proposed site is located, sits on the boundary between the existing Brook Lane and Northacre Trading Estates and the adjoining open countryside to the west (which has been allocated for employment use, in the Core Strategy adopted by Wiltshire Council). When the wider context of the adjacent trading estates is considered the proposed screen mound is largely compatible with its landscape context, with screen mounds having been created west …. and south of Westbury Diaries.

6.3. The footprint of the screen mound has been designed to avoid disturbing the hedgerow separating the field in which it is located and the one immediately to the north-west. However the proposal does necessitate the removal of 100 metre section of native hedgerow (after allowing for the 25m gap ….) which currently forms the south-western boundary of the Northacre Renewable Energy site. Consequently there is deemed to be no overall significant direct physical impacts associated with this development.

6.4. With regard to the relevant landscape character assessments, the proposed screen mound, has no adverse effect on the existing field pattern and will serve to reinforce the existing urban edge of Westbury as stipulated in core strategy CP51 …...

6.5. It is considered that the proposed screen mound will assist in reducing the current level of urbanisation of the landscape setting of the listed farmhouse at both Brook Farm and adjacent SAM site (especially when the associated tree planting has become established). It will in addition have the potential to minimise both noise levels and light spillage associated with the Northacre Renewable Energy development, for occupants of both the Brook Farm and Orchard House residences.

6.6. Overall the magnitude of landscape change …. is categorised as Small Beneficial because:

- *The section of hedgerow to be removed is relatively limited in extent and not visible from the public footpath;*
- *the hedgerow dividing the two fields and that located on the south-western boundary of the MBT facility is to be retained (and it is assumed protected from disturbance for the duration of the construction operations);*
- *there are similar man-made landforms in the immediate vicinity of the site;*
- *the mound will serve to reduce the overall visual mass of the revised renewable facility*
- *the proposed tree and shrub planting, once established, will make a positive contribution to the landscape character of the countryside on the north-western fringes of Westbury, complementing existing features like Ox's Leaze …..*

6.7. Consequently the landscape effect, for the proposed screen mound can be deemed to be Slight Beneficial overall".

These conclusions of the LVA are agreed. Notably, that the effects of the proposal on the North Bradley Rolling Clay Lowland landscape character area (which is essentially the presently open land to the west of the industrial estate) would be Slight Beneficial. A slight beneficial impact would mean that the existing landscape character in this area, which is not particularly vulnerable to change, would be maintained as a consequence of the proposed development, and this in the context of the site lying within a Core Strategy Employment Allocation.

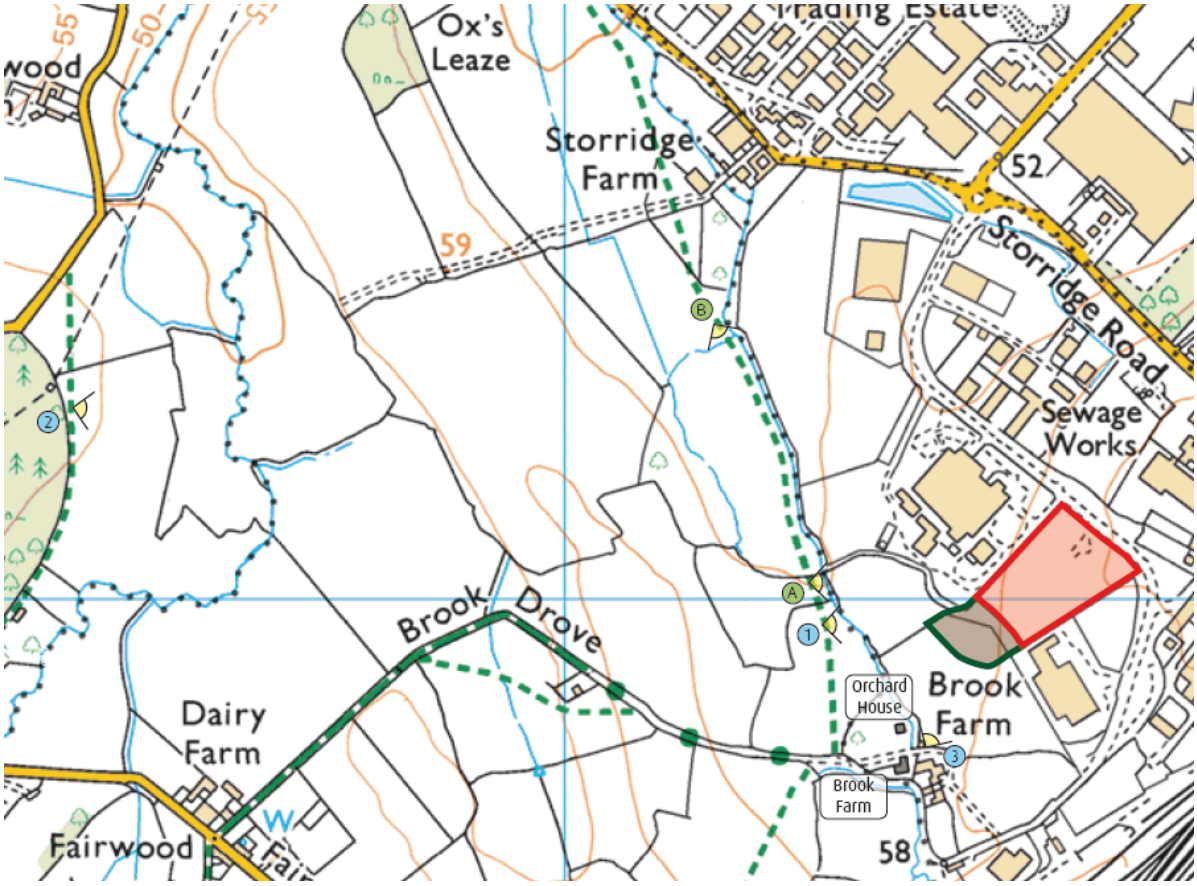
One of the existing bunds beside the Arla Dairies site (referred to in the LVA) is shown in the following photograph –

Existing bund beside Arla Dairies site

Visual effects –

Visual effects relate to the nature of the existing visual amenity of the area and the visibility of the proposed development from identified receptors. Overall visual impact is determined by combining the sensitivity of the receptor with the magnitude of visual change.

The LVA identifies a number of key local receptors, or viewpoints, and then assesses the effects of the proposed development on the views. The viewpoints are identified on the following plan forming part of the LVA. Following this, a table - also taken from the LVA - sets out the range of effects …..



LVA photograph (viewpoints) locations

Reference, Receptor and Location		Range of Effects		
		Sensitivity	Magnitude	Significance
Views from the north-west				
B	Looking south-east along length of public footpath (DMAR10)	Low to Medium	No Change	**Negligible**
PM2	Public footpath (NBRA32) on eastern edge of Round Wood	Medium to High	Small Beneficial to No Change	**Slight Beneficial to Negligible**
Views from the west				
A	Looking east at site on public footpath (DMAR10)	Low to Medium	Small Beneficial	**Slight Beneficial**
PM1	Public footpath (DMAR10) north-west of Brook Farm	Medium	Small to Medium Beneficial	**Moderate to Slight Beneficial**
View from the south				
PM3	Looking north from Brook Farm access road	Low to Medium	Small to Medium Beneficial	**Moderate to Slight Beneficial**

LVA: Viewpoints analysis

As is evident, the LVA concludes that the significance of the effects of the bund on all identified views would be between 'negligible' and 'slight beneficial', and this is agreed.

The integration of the proposed bund into the surrounding landscape would be assisted by the existing presence of similar engineered land forms (albeit unplanted) on the southern and western boundary of the adjacent Westbury Dairy. The proposed trees forming the larger part of the accompanying landscaping scheme, once fully established (and because of their elevated position clearly visible from a distance) would complement those already present in the immediate vicinity and hence serve to enhance landscape character, albeit in a relatively localised area. Consequently there is considered to be a Slight Beneficial Landscape effect on completion, increasing to Moderate to Slight Beneficial over the long term (10-15 years).

The proposed bund and proposed revised ATT facility –

The separate LVA for the standalone proposed revised ATT facility has demonstrated that the revised ATT would have insignificant impacts on landscape and visual amenity in its own right. However, the bund proposed here would contribute towards reducing the impact even further. Due to its size and scale the bund, with its associated planting would make a measureable contribution to partially screening the proposed revised ATT facility from both the public footpaths located to the west and Brook Farm to the south. Consequently the majority of visual effects would be beneficial.

9.3 Traffic & Highway Safety

Core Policy 61 of the WCS requires new development to be located and designed to reduce the need to travel. Core Policy 62 requires development to provide appropriate mitigating measures to offset any adverse impacts on the transport network at both construction and operational stages.

The proposed bund would not generate traffic at its 'operational' stage; it does, however, have potential to generate traffic at the construction stage. The potential impacts of this have been assessed in the Transport Assessment which accompanies the revised ATT application.

It has been estimated that the bund requires some 45,000 cu m of soil and sub-soil for its construction. The intended source of this material is the adjoining ATT site where it is proposed to partially lower existing ground levels. By using the removed material in the construction of the bund the two proposals – for the ATT and for the bund – in combination remove the need for both the material's export (from the ATT site) and import (to the bund site) to/from further afield. Instead the material would simply be re-distributed between the two sites. The Transport Assessment which accompanies the revised ATT planning applications estimates that this approach would remove, on average, 4 construction HGV movements per day, and this relating to export only.

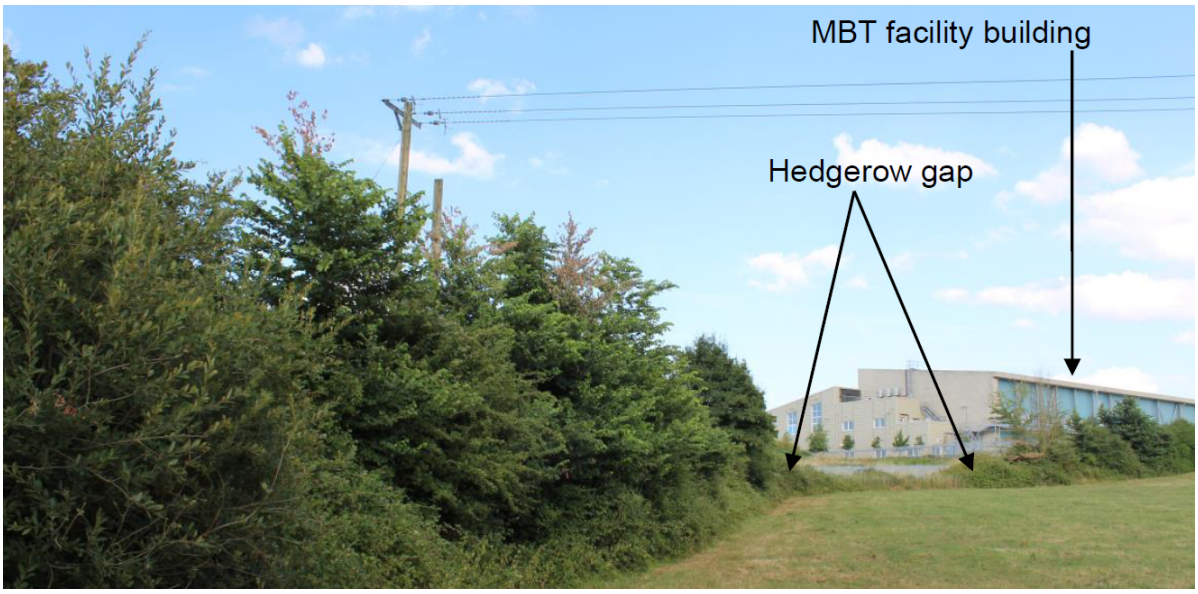
In context, 4 HGV movements per day is not significant (during the AM weekday peak the A363/A350/B3097 roundabout sees c. 117 HGV's); but nevertheless, this approach to managing construction traffic is a material consideration which weighs in favour of the bund application.

9.4 Ecology

An extended Phase 1 ecological survey of the adjoining Northacre Renewable Energy site was undertaken in September 2014 and updated in April 2018. It concludes that the

brownfield land that forms the northern-most portion of the proposed bund site has an ecological value at a 'site scale' (lowest level). The agricultural land that forms the remainder of the proposed development site is improved grassland of limited ecological value.

A c. 100m section of hedge on the existing boundary between the Northacre Renewable Energy site and the field is proposed to be removed. This hedge is of mixed quality and is 'gappy' (one gap extending to c. 25m). The loss of the hedgerow would not be detrimental to ecology; indeed, the proposed new landscaping on and around the bund would offer an enhancement.



Existing 'hedge' on boundary within site (photograph from LVA)

9.5 Heritage Assets

The Planning (Listed Buildings and Conservation Areas) Act 1990 places a duty upon local planning authorities in determining applications for development affecting listed buildings to have special regard to the desirability of preserving the special interest and setting of the listed building.

Core Policy 58 (ensuring the conservation of the historic environment) of the Wiltshire Core Strategy states that new development should protect, conserve and where possible enhance the historic environment.

The application is accompanied by a Heritage Impact Assessment (HIA). It identifies no assets directly affected by the proposal, and this is agreed. Two nearby assets are identified – Brook Farm House (a grade II listed building) and the "Medieval settlement and associated field systems west of Brook Farm (a Scheduled Monument). In relation to these – and in particular, the impact of the proposed bund on their settings – the HIA concludes the following:

"No material change in the settings of any heritage assets is expected to occur as a result of the construction of the proposed bund and (despite a minor improvement in the aesthetic quality in the views towards the consented scheme from the Scheduled Monument and the

Listed Building (where available)) there is no reduction or increase in the contribution that setting makes to the significance of any heritage asset, and thus the significance of those assets is not found to be diminished or harmed. In no case is the ability to appreciate the significance of any asset considered to diminished. The proposed changes are therefore considered to be acceptable in respect of the heritage resource".

This conclusion is agreed. In terms of the NPPF tests, the proposed bund would not cause 'harm' (less than substantial or otherwise) to the assets; but rather it would have a neutral effect.

There is limited potential for a direct impact on any unknown archaeological remains.

9.6 Drainage

The application is accompanied by a 'Technical Note' which assesses flood risk and drainage.

The site lies within Flood Zone 1 (lowest risk of flooding). Accordingly, the bund does not create a flood risk to the site or to the surrounding area.

A detailed Drainage Strategy report has been produced for the proposed ATT facility. It proposes an on-site network for managing surface water, eventually discharging into Wessex Waters sewers in Stephenson Road. Drainage arrangements for the screen bund on its north-east side have been allowed for in the ATT facility strategy. All other areas would drain naturally in a south-westerly direction towards the Biss Brook, as presently. These arrangements are satisfactory.

9.7 Residential amenity

The bund is sufficiently distanced from residential properties to ensure no impacts on residential amenity. Potential noise during construction can be managed by a Construction and Environmental Management Plan (CEMP), which is a matter for conditions.

10. Conclusion

The proposed bund would be located on land allocated for development in the Wiltshire Core Strategy. Its impact on matters of acknowledged importance – notably, landscape, amenity, highway safety and heritage assets – has been demonstrated to be acceptable. Indeed, there are benefits arising in terms of softening the impact of other developments and reducing construction traffic. For all these reasons the presumption on favour of development applies, and the application is recommended for approval accordingly.

RECOMMENDATION

That the application be approved subject to the following conditions –

1 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

REASON: To comply with the provisions of Section 91 of the Town and Country Planning Act 1990 as amended by the Planning and Compulsory Purchase Act 2004.

2 The development hereby permitted shall be carried out in accordance with the following approved plans:

- No. 18616-500-03A (Location Plan) dated 10/2018
- No. NOR-LP02 Rev A (Screen Mound Plan) dated 09/2018
- 'Technical Report - Screen Mound' by Floodline Consulting dated 05/10/2018

REASON: For the avoidance of doubt and in the interests of proper planning.

3 With the exception of its final surfacing with top soil, the bund hereby approved shall be constructed from existing inert soils and sub-soils derived from the adjacent Northacre Renewable Energy site only. No other materials shall be used in the construction of the bund, including non-existing materials that may be imported to and/or stored at the Northacre Renewable Energy site.

REASON: To accord with the terms of the proposal and to minimise construction traffic generation in the interests of amenity.

4 All soft landscaping comprised in the approved details of landscaping shall be carried out in the first planting and seeding season following the first occupation of the building(s) or the completion of the development whichever is the sooner; All shrubs, trees and hedge planting shall be maintained free from weeds and shall be protected from damage by vermin and stock. Any trees or plants which, within a period of five years, die, are removed, or become seriously damaged or diseased shall be replaced in the next planting season with others of a similar size and species, unless otherwise agreed in writing by the local planning authority. All hard landscaping shall also be carried out in accordance with the approved details prior to the occupation of any part of the development or in accordance with a programme to be agreed in writing with the Local Planning Authority.

REASON: To ensure a satisfactory landscaped setting for the development and the protection of existing important landscape features.

5 No development hereby approved shall take place until a site specific Construction Environmental Management Plan has been submitted to and been approved in writing by the local planning authority. The plan must demonstrate the adoption and use of the best practicable means to reduce the effects of noise, vibration, dust and site lighting during construction. The plan should include, but not be limited to:

- Procedures for maintaining good public relations including complaint management, public consultation and liaison
- Arrangements for liaison with the Council's Public Protection Team
- All works and ancillary operations which are audible at the site boundary, or at such other place as may be agreed with the Local Planning Authority, shall be carried out only between the following hours:
  08 00 Hours and 18 00 Hours on Mondays to Fridays and 08 00 and 13 00 Hours on Saturdays and; at no time on Sundays and Bank Holidays.
- Construction deliveries to and removal of plant, equipment, machinery and waste from the site must only take place within the permitted hours detailed above.
- Mitigation measures as defined in BS 5528: Parts 1 and 2 : 2009 Noise and Vibration Control on Construction and Open Sites shall be used to minimise noise disturbance from construction works.
- Procedures for emergency deviation of the agreed working hours.
- Control measures for dust and other air-borne pollutants.
- Measures for controlling the use of site lighting whether required for safe working or

for security purposes.
- Construction traffic routes.

REASON: In the interests of the amenities of surrounding occupiers during the construction of the development.

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Wiltshire Council
Where everybody matters

18/09550/FUL
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BA13 4WD

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