



The Sizewell C Project

6.10 Volume 9 Rail
Chapter 11 Geology and Land Quality
Appendices 11A - 11C
Part 3 of 3

Revision: 1.0
Applicable Regulation: Regulation 5(2)(a)
PINS Reference Number: EN010012

May 2020

Planning Act 2008
Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009



Appendix C. BGS Borehole Logs

WATER RESOURCES BOARD WELL RECORD		W.R.B. REF. No. Tm 46/30
SHEET 1		R.A. LICENCE No.
1. WELL IDENTITY	NATIONAL GRID REFERENCE Tm 4398 6395	
Well at Aldhurst farm Leiston	I.G.S. REF. No.	
Town	RIVER AUTHORITY	
County	HYDROMETRIC AREA 35	
Owner of well	SUB-CATCHMENT	
Well made by	Date of sinking	
Information from W.D.W.	Date received Jan. 1978	
2. WELL DESCRIPTION	O.D. of measuring Pt. 2/1933m.	
Level of ground surface 19.33 m.	If well top is not at above* m.	
above sea level (O.D.) ft.	ground level how far below ft.	
Shaft m. deep; diameter at top mm.	; at bottom mm.	
..... ft. in. in.	
Bore 16.44 m. deep; Diameter at top 91.44 mm.	; at bottom 91.44 mm.	
..... ft. in. in.	
Details of headings		
DETAILS OF PERMANENT LINING TUBES		
Length m.; Diam. mm.; Slotted m.; Diam. mm.; Top m. above* surface	Plain ft. in. ft. in. ft. below surface	
Length m.; Diam. mm.; Slotted m.; Diam. mm.; Top m. above* surface	Plain ft. in. ft. in. ft. below surface	
Length m.; Diam. mm.; Slotted m.; Diam. mm.; Top m. above* surface	Plain ft. in. ft. in. ft. below surface	
Details of well screen		
DETAILS OF REST WATER LEVELS DURING CONSTRUCTION		
Water struck at depths of below well top		
Rest level of water m. above* O.D.* m. deep. Date	below well top when bore ft.	
Rest level of water m. above* O.D.* m. deep. Date	below well top when bore ft.	
Rest level of water on completion of bore m. above* O.D.* m. deep. Date	below well top when bore ft.	
Method of drilling		
Brief details of well development e.g. acid treatment etc.		

* delete as applicable

WATER RESOURCES BOARD WELL RECORD	W.R.B. REF NO. TM 46/30 R.A. LICENCE NO.
SHEET 2	
4. HYDROGEOLOGY	
Topography AT WELL SITE Local depression <input type="checkbox"/> , Flat surface <input type="checkbox"/> , Hill top <input type="checkbox"/> , Hillside <input type="checkbox"/> , Valley bottom <input type="checkbox"/> , Terrace <input type="checkbox"/>	
MAJOR AQUIFER Cr. ag. Lithology	
Depth to top of aquifer m. ft.	Thickness penetrated 16.44 m. ft.
Top of aquifer ADD m. ft.	Total thickness of aquifer 16.44 m. ft.
Coefficient of storage Transmissivity $\frac{m^2/day}{gals/day/ft.}$	
MINOR AQUIFER Lithology	
Depth to top of aquifer m. ft.	Thickness penetrated m. ft.
Top of aquifer m. ft.	Total thickness of aquifer m. ft.
Coefficient of storage Transmissivity $\frac{m^2/day}{gals/day/ft.}$	
ADDITIONAL NOTES:	
<p>An observation borehole of Anglian W.A. (Norfolk & Suffolk River Div.), measured from a rim of M.H. cover every month</p> <p>Records available from: July 1968</p> <p>Surface seen at gauging station Thorpe Ness Mere. TM 468 594.</p> <p>Nearest rain fall station Theberton TM 437 660</p>	

* delete as applicable

RR 18127/1/2173 5m 5/71 TP

Appendix D. Zetica UXO Maps

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Map Centre: 643937,263437



LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- military
- industry
- UXO find
- transport
- dock
- Luftwaffe targets
- utilities
- other

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: +44 (0) 1993 886682

email: uxo@zetica.com

web: www.zeticauxo.com

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Appendix E. Planning applications



PLANNING PERMISSION

TOWN AND COUNTRY PLANNING ACT 1990 TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) ORDER 2010

DC/14/4224/FUL

Agent

Miss Carly Vince
EDF Energy Ltd
EDF Energy - Nuclear New Build
The Qube
90 Whitfield Street
London
W1T 4EZ

Applicant

Miss Carly Vince
EDF Energy Ltd
EDF Energy - Nuclear New Build
The Qube
90 Whitfield Street
London
W1T 4EZ

Parish

Leiston

Date Valid

23rd December 2014

Proposal:

Creation of approximately 6ha of wetland habitat, including wet reedbed, open-water and perimeter ditches within 4 ground water basins together with marginal drier reed habitat. Soils excavated to create the basins, would be used across the wider site to establish a landscape including grassland, heathland, scrub and scattered trees. Other associated works includerealignment of the existing watercourse, the relocation of groundwater abstraction boreholes, a new pump house and fencing.

Site:

Land South And West Of, Lovers Lane, Leiston

PERMISSION IS HEREBY GRANTED by **SUFFOLK COASTAL DISTRICT COUNCIL** as Local Planning Authority for the purposes of the **TOWN AND COUNTRY PLANNING ACT 1990**, for development in complete accordance with the application shown above, the plan(s) and information contained in the application, and subject to compliance with the following conditions as set out below. Your further attention is drawn to any informatives that may have been included.

In determining the application, the Council has given due weight to all material planning considerations including policies within the development plan as follows:

Conditions:

1. The development hereby permitted shall be begun within a period of three years beginning with the date of this permission.

Reason: In accordance with Section 91 of the Town and Country Planning Act 1990 as amended.

2. The development hereby permitted shall be carried out in accordance with the drawings and documents listed below and any other drawings approved subsequently by the Council as local planning authority pursuant to any conditions on this decision letter.

Documents:

- Design Statement (December 2014) ;

- Ecology and Landscape Management Plan (December 2014) ;
- Water Framework Directive Assessment (December 2014);
- Land Contamination Assessment (December 2014);
- Design and Access Statement (December 2014);
- Planning Statement (December 2014);
- Landscape and Visual Appraisal (December 2014);
- Ecological Appraisal (December 2014);
- Heritage Statement (December 2014);
- Flood Risk Assessment (December 2014);
- Materials Management Plan (December 2014) ; and
- Construction Management Strategy (December 2014).

Drawings:

- 35242-LON-CVD-0001 Site Location Plan;
- 35242-LON-CVD-0003 Proposed Wetland Habitat Area (Sheet 1 of 3);
- 35242-LON-CVD-0004 Proposed Wetland Habitat Area (Sheet 2 of 3);
- 35242-LON-CVD-0005 Proposed Wetland Habitat Area (Sheet 3 of 3);
- 35242-LON-CVD-0007 Proposed Fencing;
- 35242-LON-CVD-0008 Water Level Control Structure General Arrangement;
- 35242-LON-CVD-0009 Maintenance Access Structure General Arrangement;
- 35242-LON-CVD-0010_B Proposed Access Design;
- 35242-LON-CVD-0012 Temporary Watercourse Crossing across WWTW drain;
- 35242-LON-CVD-0013 Temporary Watercourse Crossing across Aldhurst Valley Stream;
- 35242-LON-CVD-1001 Tree Retention and Removal Plan;
- 35242-LON-CVD-1002 Landscape Masterplan;
- 35242-LON-CVD-1003 Landscape Sections; and
- 35242-LON-CVD-1004_B Proposed Levels and Soil Distribution plan.

Reason: For the avoidance of doubt and to ensure a properly planned and detailed development.

3. (a) Notification of the commencement of Preliminary Works as outlined in Section 2.2 of the Construction Management Strategy shall be provided to the local planning authority 10 working days prior to commencement of the works.
(b) Notification of the commencement of Main Works as outlined in Section 2.3 of the Construction Management Strategy shall be provided to the local planning authority 10 working days prior to commencement of the works.

Reason: To provide notification of commencement of works.

4. All construction traffic (including HGV movements) shall be managed in accordance with the Construction Traffic Management Plan (Appendix B of the Construction Management Strategy) unless otherwise agreed in writing with the local planning authority.

Reason: In the interests of highway and public safety.

5. The construction works shall be undertaken in accordance with the methodology set out in Sections 2.2 and 2.3 of the Construction Management Strategy. Construction management measures and controls identified in Section 3 of the Construction Management Strategy shall be complied with and implemented unless otherwise agreed in writing by the local planning authority.

Reason: To ensure environmental protection and to minimise impacts on the environment and human receptors during the construction phase of the development.

6. There is to be no construction traffic entering or exiting the development site from Carr Avenue / Valley Road.

Reason: To reduce and / or remove as far as is reasonably possible the effects of HGV traffic in residential areas.

7. No part of the development that includes the bringing of heavy machinery / HGV's to the site shall take place until the existing vehicular access to Abbey Road has been improved, laid out and completed, in accordance with submitted drawings (except for vehicles bringing the necessary plant and materials to complete these access works). This is to include properly surfaced with a bound material for a minimum distance of 20 metres from the edge of the metalled carriageway and clearance of the ditch to Abbey Road.

Reason: In the interests of highway safety to ensure that the layout of the access is properly designed, constructed and provided before the development is commenced.

8. Prior to development commencing on site details of the siting of the construction compound and a programme for its implementation, are to be submitted to the local planning authority for approval.

Reason: To ensure that the compound is appropriately sited in relation to neighbouring residential properties so as to cause minimal disturbance to occupiers of neighbouring properties.

9. There is to be no discharge of surface water from the site access on Abbey Road to the highway network.

Reason: To prevent hazards caused by flowing water or ice on the highway.

10. On the Abbey Road frontage, the gates are to be set back a minimum distance of 20m from the edge of the carriageway and are to open into the site only (as detailed on approved drawing no: 35242-LON-CVD-0010_B).

Reason: In the interests of road safety.

11. On the Lovers Lane frontage, the gates are to be set back a minimum distance of 10m from the edge of the carriageway and are to open into the site only (as detailed on approved drawing no: 35242-LON-CVD-0010_B).

Reason: In the interests of road safety

12. Prior to first use of the Abbey Road access for HGV traffic, clear visibility at a height of 0.6 metres above the carriageway level shall be provided and thereafter permanently maintained in that area between the nearside edge of the metalled carriageway and a line 2.4 metres from the nearside edge of the metalled carriageway at the centre line of the access point and a distance of 90 metres in each direction along the edge of the metalled carriageway from the centre of the access. Notwithstanding the provisions of Part 2 Class A of the Town and Country Planning (General Permitted Development) Order 1995 (or any Order revoking and re-enacting that Order with or without modification) no obstruction over 0.6 metres high shall be erected, constructed, planted or permitted to grow within the areas of the visibility splays.

Reason: To ensure vehicles exiting the drive would have sufficient visibility to enter the public highway safely, and vehicles on the public highway would have sufficient warning of a vehicle emerging to take avoiding action.

13. Prior to first use of the Lovers Lane accesses for traffic, clear visibility at a height of 0.6 metres above the carriageway level shall be provided and thereafter permanently maintained in that area between the nearside edge of the metalled carriageway and a line 2.4 metres from the nearside edge of the metalled carriageway at the centre line of the access point and a distance of 160 metres in each direction along the edge of the metalled carriageway from the centre of

the access. Notwithstanding the provisions of Part 2 Class A of the Town and Country Planning (General Permitted Development) Order 1995 (or any Order revoking and re-enacting that Order with or without modification) no obstruction over 0.6 metres high shall be erected, constructed, planted or permitted to grow within the areas of the visibility splays.

Reason: To ensure vehicles exiting the drive would have sufficient visibility to enter the public highway safely, and vehicles on the public highway would have sufficient warning of a vehicle emerging to take avoiding action.

14. (a) The hours of construction shall be limited to 07.00 hours to 18.00 hours Mondays to Fridays and 08.00 hours to 13.00 hours on Saturdays, with no construction work to take place on Sundays or Bank Holidays. Between 18.00 - 19.00 Monday to Friday and 13.00 - 14.00 Saturday, work for the purposes of closing the site may take place. A 24 hour, 7 days a week security presence on site is permitted.
(b) Paragraph 14 (a) excludes emergency or maintenance works.

Reason: To safeguard the amenities of residential neighbouring properties.

15. All excavated materials shall be managed in accordance with Sections 4 to 7 of the Materials Management Plan, unless otherwise agreed in writing with the local planning authority.

Reason: To ensure a safe and controlled re-use of material and to prevent pollution.

16. (a) Tree protection measures outlined in the Tree and Hedge Report (Appendix F of the Construction Management Plan), shall be implemented. Such protection shall be maintained until all equipment, machinery and surplus materials have been removed from the site.
(b) No retained trees and hedges (means an existing tree or hedge which is to be retained in accordance with the approved plans) shall be cut down, uprooted or destroyed without the prior written approval of the local planning authority.
(c) If any retained tree dies or becomes seriously damaged or defective within a period of five years of the commencement of any works, another tree of a similar species shall be planted in a similar location and at such a time, as agreed in writing by the local planning authority.

Reason: To protect and improve the character and amenities of the area.

17. All works shall be undertaken, and existing ecology protected in accordance with the measures identified in Section 2.3 and Appendix C of the Ecological Appraisal (December 2014), unless otherwise agreed in writing with the local planning authority.

Reason: To protect existing ecology.

18. There is to be no fish stocking of the hereby approved basins without the prior written consent of the local planning authority.

Reason: To minimise risk from disease or alien species entering into the system.

19. (a) Prior to commencement, a written statement and timetable for the completion of the post-investigation archaeological assessments shall be submitted for written approval by the local planning authority together with Written Scheme of Investigations for monitoring any groundworks required for the temporary construction compound and for dealing with any chance finds from the waterlogged deposits within the basins.
(b) Within 12 months of commencement, all post-investigation assessments shall be completed and provision made for publication and dissemination of results and archive deposition.

Reason: To safeguard archaeological assets within the approved development boundary from impacts relating to any groundworks associated with the development scheme and to ensure the proper and timely investigation, recording, reporting and presentation of archaeological

assets affected by this development, in accordance with Strategic Policies SP1 and SP15 of SCDC DPD 2013 and the NPPF 2012.

20. (a) All planting works shall be carried out in accordance with Sections 3.1 and 3.2 of the approved Ecology and Landscape Management Plan unless otherwise agreed in writing with the local planning authority.
(b) The habitats shall be managed and monitored in accordance with sections 4.2.2 and 5.3 of the approved Ecology and Landscape Management Plan unless otherwise agreed in writing with the local planning authority.

Reason: To ensure that the landscape scheme is implemented and maintained.

21. The development hereby permitted shall be carried out in accordance with the mitigation measures identified in Section 6.3 of the approved Flood Risk Assessment unless otherwise agreed in writing with the local planning authority. No material shall be placed below 5m AOD, unless otherwise agreed in writing with the local planning authority.

Reason: To ensure there is no loss of floodplain storage or deflection of flow routes as a result of the proposed development.

22. Details of the location, scale, external appearance and servicing of the pumphouse(s) shall be approved in writing by the local planning authority prior to construction of the pumphouse(s).

Reason: To ensure the local planning authority is satisfied with the location and external appearance of the building.

23. (a) A scheme for monitoring groundwater levels downstream of the development is to be submitted to the local planning authority for approval prior to the commencement of the Main Works (as defined in section 2.3 of the Construction Management Strategy) dewatering. The approved scheme shall be implemented one month prior to the commencement of dewatering of any groundwater basin or perimeter ditch in the Main Works, and shall continue for one month following the cessation of all dewatering activities.
(b) Dewatering shall be undertaken in accordance with Sections 2.3 of the Construction Management Strategy, unless otherwise agreed in writing with the local planning authority.
(c) Recharge measures as detailed in Section 2.3 of the Construction Management Strategy shall be implemented during the Main Works if groundwater levels fall below a level agreed in the approved scheme for monitoring.

Reason: To ensure the groundwater environment in the vicinity of the site is adequately protected from dewatering.

24. Notification of the completion of the planting and habitat creation works shall be provided to the local planning authority within 28 days of completion.

Reason: To enable future public access to the site in line with Condition 25.

25. A plan setting out future public access arrangements across the site shall be submitted for approval by the local planning authority within 3 years of completion of the planting and habitat creation (the date notified in condition 24). Access arrangements shall then be carried out in accordance with the approved plan.

Reason: To open up parts of the site for quiet public recreation, in a manner that does not compromise the agreed habitat management objective.

26. If during development, contamination not previously identified is found, the development within a defined and agreed area (to be agreed with the local planning authority) is to stop until a

remediation strategy has been submitted for how to deal with this. The agreed remediation strategy is to be implemented as approved.

Reason: NPPF para. 109 states that 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 affected by unacceptable levels of water pollution, (see informative 10).

Informatives:

1. Public footpath no. 18 runs alongside proposed basin D, with an existing watercourse to the south. There must be sufficient width left for the footpath between the existing watercourse and the new basin. The statutory width of the headland path is 1.5m and there must be a safe margin between the edge of the path and the new basin.
2. Any measures that need to be taken to protect the public using footpath no. 18 must be undertaken in consultation with the Suffolk County Council Rights of Way team - 03456 066067.
3. The lorry movements associated with the importation of granular stone for construction of the compound and hardstanding should be spaced evenly throughout the working day.
4. The application refers to temporary signage within the public highway, this will need to be agreed by Suffolk County Council as Highway Authority and may require a legal agreement. SCC's Area Manager can be contacted at 01728 652400 for discussion and consultation.
5. It is an OFFENCE to carry out works within the public highway, which includes a Public Right of Way, without the permission of the Highway Authority. Any conditions which involve work within the limits of the public highway do not give the applicant permission to carry them out. Unless otherwise agreed in writing all works within the public highway shall be carried out by the County Council or its agents at the applicant's expenses. SCC's Area Manager must be contacted at 01728 652400. Further information can be found at: www.suffolk.gov.uk/environment-and-transport/highways/dropped-kerbs-vehicular-access/. A fee is payable to the Highway Authority for the assessment and inspection of both new vehicular crossing access works and improvements deemed necessary to existing vehicular crossings due to proposed development.
6. SCC highway apparatus appears to be affected by this proposal. The applicant must contact SCC's Area Manager for Highways on 01728 652400 to agree any necessary alterations to be carried out at the expense of the developer.
7. Public Utility apparatus may be affected by this proposal. The appropriate utility service should be contacted to reach agreement on any necessary alterations which have to be carried out at the expense of the developer.
8. As recognised in the FRA, consent will be required from the Internal Drainage Board under section 23 of the Land Drainage Act for the two proposed temporary culverts, as well as for the channel realignment by the former irrigation pond and the diversion of the watercourse near Brick Kiln Farm. It has been recognised in the FRA that the regular inspection and clearance of the temporary culverts will be important to ensure they maintain their capacity and reduce the likelihood of blockages. Their removal at the end of the construction period will be important to retain the original channel conveyance capacity.
9. The Eels (England and Wales) Regulations 2009 (the Regulations) came into force on 15 January 2010 to support the UK in implementing EC Council Regulation (1100/2007) (the EC Eel Regulation). Under this European Regulation, the UK must take actions to halt and reverse the decline in the European eel stock, aiming to meet a target set for the number of

mature adult eels leaving each river basin to return to spawn at sea. The EC Eel Regulation requires eel passage to be considered as part of the solution. For in-river developments that pose a risk to eel, such as impoundments, passes must be provided as part of the development. The Minsmere Sluice is now passable to eels (as of April 2014). Any new in-river structures need to be designed to allow eel passage for use of the proposed wetland habitat.

10. It is recommended that the developer follows the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination, when dealing with land affected by contamination. In addition, refer to the Environment Agency guiding principles for land contamination for the type of information required in order to assess risks to controlled waters from the site. The local planning authority can advise of risk to other receptors, such as human health.
11. In addition to planning permission, three water resource licences will be required from the Environment Agency.
12. Please note applications to discharge planning conditions will be charged at £97 per request (current fees).



Head of Planning Services

Date: 9th March 2015

PLEASE READ NOTES BELOW

Note

Most work, including change of use, has to comply with Building Regulations. Have you made an application or given notice before work is commenced?

Note

1. If the applicant is aggrieved by the decision of the Local Planning Authority to refuse permission or consent, or to grant permission or consent subject to conditions, he may appeal to the First Secretary of State. The applicant's right to appeal is in accordance with the appropriate statutory provisions which follow:

Planning applications: Sections 78 and 79 Town & Country Planning Act 1990

Listed Building applications: Section 20, 21 and 22 Planning (Listed Buildings and Conservation Areas) Act 1990.

Advertisement applications: Section 220 and 221, Town and Country Planning Act 1990 Regulation 15 Town & Country Planning (Control of Advertisements) Regulations 1989.

2. **Notice of appeal** in the case of applications for advertisement consent must be served within **two months** of the date of this notice. Householder planning applications must be served within **twelve weeks** of the date of this notice. In all other cases, notice of appeal must be served within **six months** of the date of this notice. Appeals must be made on a form which is obtainable from The Planning Inspectorate, Registry/Scanning Room, 3/05 Kite Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN; or online at <http://www.planningportal.gov.uk/planning/appeals/>. The Planning Inspectorate website can be viewed at <http://www.planning-inspectorate.gov.uk/>.

3. The First Secretary of State has power to allow a longer period for the giving of notice of appeal but he will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice of appeal. The First Secretary of State is not required to entertain an appeal if it appears to him that permission for the proposed development could not have been granted by the Local Planning Authority, or could not have been so granted otherwise than subject to the conditions imposed by them, having regard to the statutory requirements, to the provisions of the Development Order, and to any directions given under the Order. He does not in practice refuse to entertain appeals solely because the decision of the Local Planning Authority was based on a direction given by him.

4. If permission or consent to develop land or carry out works is refused or granted subject to conditions, whether by the Local Planning Authority or by the First Secretary of State, and the owner of the land claims that the land has become incapable of reasonably beneficial use by the carrying out of any development or works which has been or would be permitted, he may serve on the Council of the district in which the land is situated a purchase notice requiring the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

5. In certain circumstances, a claim may be made against the Local Planning Authority for compensation where permission is refused or granted subject to conditions by the First Secretary of State on appeal or on a reference of the application to him. The circumstances in which such compensation is payable are set out in Sections 114 and 116 of the Town and Country Planning Act 1990.

ALDHURST FARM | HABITAT CREATION SCHEME PLANNING APPLICATION

Land Contamination Assessment

December 2014



ALDHURST FARM HABITAT CREATION SCHEME LAND CONTAMINATION ASSESSMENT



NOT PROTECTIVELY MARKED

NOT PROTECTIVELY MARKED

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to present a land contamination assessment for the habitat creation scheme proposed for the Aldhurst Farm site (the 'Site'). The remainder of this chapter provides a summary of the proposed scheme and the components that are relevant to this land contamination assessment.

The structure of this document is as follows:

- Chapter 2 provides a summary of the legislation, guidance and policy relevant to land contamination;
- Chapter 3 provides a summary of the available data sources and investigations undertaken;
- Chapter 4 describes the conceptual site model;
- Chapter 5 assesses the potential for peat to generate acidic drainage;
- Chapter 6 assesses the risks associated with existing contamination; and
- Chapter 7 presents the conclusions drawn from the assessment.

This assessment has been used to inform the habitat creation proposals, the Materials Management Plan and the Construction Management Strategy.

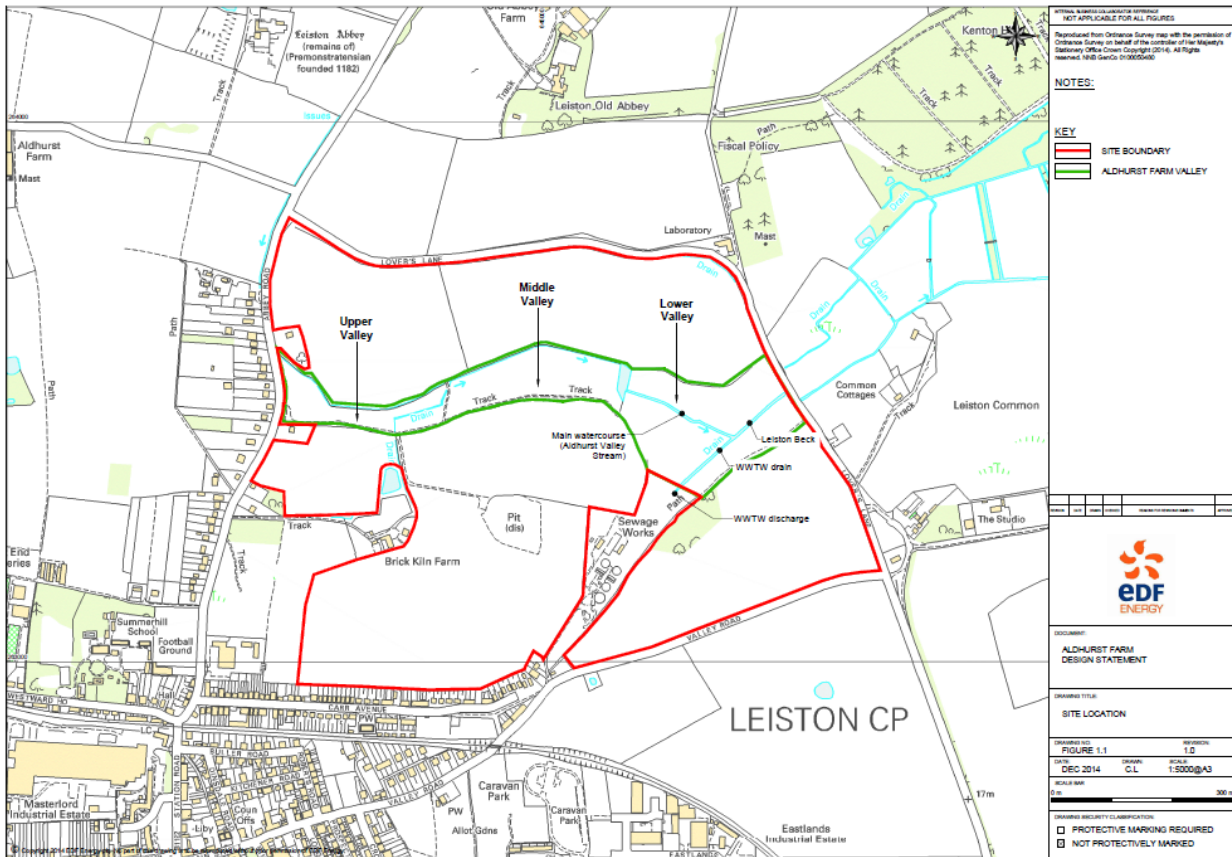
1.2 The Aldhurst Farm Site

The Aldhurst Farm site is situated at National Grid Reference TM449633, immediately to the north-east of Leiston, Suffolk and covers an area of approximately 67ha (Figure 1.1). The site is used for arable farming.

It is bounded by Lover's Lane to the north and east; by Valley Road to the south-east; and residential areas in Leiston and along the B1122 to the south and west, respectively. The Aldhurst Valley Stream crosses the site from west to east and joins the Leiston Wastewater Treatment Works (WWTW) Drain to form Leiston Beck in the lower valley, just upstream of Lover's Lane.

The site is not a designated nature conservation site and is not located within any landscape designation, however it is located immediately to the west of Sizewell Marshes SSSI and the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB).

Figure 1.1 Site Location



Note: figures that are referenced in this report are embedded in the text and the larger plans are also presented in Appendix C.

The site includes a restored landfill and a pump house for spray irrigation boreholes.

1.3 The Scheme

The overall scheme objectives are to:

- Create and maintain approximately 5 ha of wet reed habitat, incorporating between 20-30% open water habitat and approximately 5-15% of later succession habitats that support a characteristic assemblage of reedbed plant and animal species;
- Create and maintain approximately 0.8 ha of reed based tall herb fen that supports a characteristic assemblage of tall herb fen plant and animal species;

- Create and maintain approximately 2km of perimeter ditch habitat that supports a diverse vascular plant assemblage and a range of fauna characteristic of lowland ditch habitat;
- Create and maintain a mosaic of neutral and acid grassland / heathland, scrub and scattered trees transitioning from the perimeter ditches and across the wider site;
- Ensure no net loss of biodiversity on the Aldhurst Farm site as a result of the habitat creation scheme, and maximise the floral and faunal biodiversity of the created and retained habitats;
- In the longer term, enhance ecological connectivity between Aldhurst Farm and Sizewell Marshes SSSI beneath Lover's Lane;
- Ensure that the scheme landscape reflects the distinctive land-use and vegetation typologies of the adjacent Estate Sandlands and Coastal Levels character types; and
- In the longer term, open up parts of the site for quiet public recreation, in a manner that does not compromise the above habitat management objectives.

In summary, the main components of the scheme relevant to this land contamination assessment are:

- Construction of 4 groundwater basins. The depth of excavation will range from 1 to 3 m below ground level and generate approximately 83 000 m³ of material comprising top soil; peat, clay and sand;
- Use of the excavated peat, topsoil and sand from the groundwater basins as a soil conditioner across the rest of the site, to assist in creation of terrestrial habitats;
- Relocation of the existing spray irrigation abstraction and construction of up to two replacement boreholes to provide stream support to the Leiston Beck under drought conditions.

Further details of the scheme are provided in the Design Statement which supports the planning application.

2 LEGISLATION, POLICY AND GUIDANCE

2.1 Introduction

The potential risks and liabilities associated with potential contaminants at any site should be assessed using a risk based framework established to support the implementation of the contaminated land regime in the UK.

2.2 Legislative Context

The contaminated land regime is set out within Part 2A of the Environmental Protection Act (EPA) 1990. The regulations are in turn supported by statutory (updated in 2012¹) and non-statutory guidance issued by Defra and the EA (CLR 11²) and various other supporting documents.

A range of technical approaches to risk assessment of chemical contaminants exist, all of which fit broadly within a tiered approach. The tiered approach to assessing risks from land contamination is set out in the Defra and Environment Agency publication "Model Procedures for the Management of Land Contamination" (Defra/EA 2004) CLR11.

A risk assessment has been undertaken at the site to identify potential risks from historical land contamination and to enable appropriate risk management actions to be undertaken in accordance with the regulatory context.

Contaminated land based site investigations should be designed and undertaken with reference to any proposed redevelopment of the site, and undertaken in accordance with the EA guidance CLR11, BS10175:2011 (Investigation of potentially contaminated sites – Code of practice) and BS5930:1999(A2) (Code of practice for site investigations).

2.3 Planning Policy Context

Construction of the habitats at Aldhurst Farm requires planning permission. As such the development as proposed should be consistent with planning policy and guidance. At the national level planning guidance relating to the development of land potentially affected by contamination is detailed in the National Planning Policy Framework (NPPF), March 2012.

The NPPF sets out the Government's planning policies for England and how these should be applied. With regard to contaminated land it states at paragraph 109 that:

¹ Defra. Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance, April 2012.

² Environmental Agency CLR11 - Model Procedures for the Management of Land Contamination.

- The natural environment should be conserved and enhanced by remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land;
- In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity value; and
- Planning policies and decisions should encourage the effective use of land by re-using land that has previously been developed (Brownfield land), provided that it is not of high environmental value.

Therefore, planning policies and decisions should also ensure (paragraph 121) that:

- A site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and
- Adequate site investigation information, prepared by a competent person, is presented.

3 DATA SOURCES AND SITE INVESTIGATIONS

3.1 Introduction

Information on baseline conditions and potential sources of contamination at the site has been collated from the following sources:

- Regulatory consultation - The Environment Agency has provided information on landfills in the vicinity of the site;
- Landmark Sitecheck Report, Historical Maps and Aerial Photographs;
- Consultation with the current landowner;
- Site walkover survey carried out by AMEC; and
- Various intrusive site investigations (Section 3.4).

3.2 Historical Maps

The historical land use of the site and immediate surroundings has been determined with reference to a series of historical Ordnance Survey (OS) maps. The historical land uses identified are summarised in Table 3.1 below.

Table 3.1 Summary of Site History

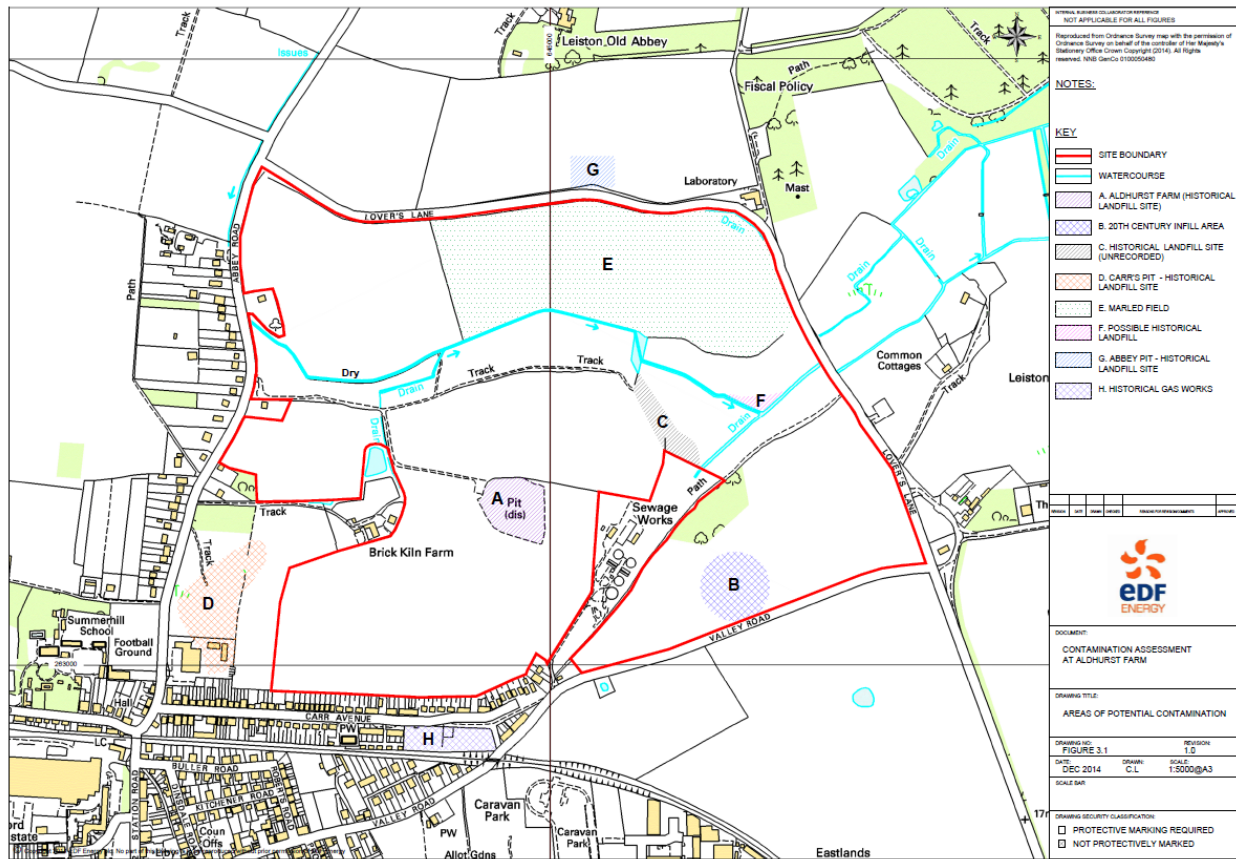
Map Year (Scale)	Site	Surrounding Land Use
1884 – 1890 (1:10,560)	Farmland with field boundaries largely consistent with present day configuration. Clay pit marked in the approximate centre.	Undeveloped farmland and/or common land to north and east, with an old sand pit adjoining northern boundary. Farmland, Brickworks (including kilns and a tramway) and Brickworks Farm adjacent to the west. Farmland to south with a railway line and residential (Leiston town) approximately 100m to south.
1905 (1:10,560)	No significant changes.	Excavation works shown within Brickworks. Sewage Disposal Works infrastructure shown adjacent to central southern site boundary.
1927 (1:2500)	No significant changes.	Surrounding area remains largely farmland, however, the area to immediate west and south has some additional residential development. Sewage Disposal Works infrastructure has increased and a Pumping Station is marked at the present day location. Two small circular structures associated structures are shown approximately 60m to the south of the southern boundary. This are later identified as a gas works.
1938 (1:10,560)	No significant changes.	No significant changes.
1958 (1:10,560)	No significant changes.	The immediate surrounding area to the west and south has become further developed with residential properties. Brickworks, kilns and other infrastructure to the west are no longer shown. However, the brickworks

Map Year (Scale)	Site	Surrounding Land Use
		excavations remain.
1970-1971 (1:2,500)	No significant changes – only the south-western quarter of the site is visible.	A large disused pit associated with the Brickworks, is located adjacent to the southern end of the western boundary of the site. A miniature rifle range is shown on the site of the main former brickworks, approximately 75m to the west of the site.
1976-1977 (1:10,000)	Clay pit on-site is shown as being tree covered.	No significant changes.
1986 (1:2,500)	No significant changes	The gas works and associated infrastructure have been demolished and the space partially replaced by a Depot and electrical sub-station.

Information provided in the Landmark Sitecheck Report and obtained from the Environment Agency has identified:

- Area A - Restored landfill (Aldhurst Farm Pit, a former clay pit) located in the southern part of the site (Figure 3.1 and Chapter 6). This pit received household, industrial, commercial and inert waste between 1990 and 1996.
- Area D - Closed landfill, Carr’s Pit, located just outside of the south- east boundary of the site. This pit received inert and industrial waste between 1976 and 1987.
- Area G - Closed landfill (Abbey Pit) located just outside of the north-east boundary of the site (Figure 3.1 and Chapter 6). No details pertaining to the nature and dates of waste received are available.
- Area H – Former Gas Works Infrastructure, approximately 60m to the south of the site (1971 and 1986 historical maps).

Figure 3.1 Areas of Potential Contamination



3.3 Walkover Survey

A site walkover survey was undertaken in October 2014 and included discussions with the current landowner. The walkover identified a number of potential additional sources of contamination (See Figure 3.1 and Chapter 6) which include:

- Area B - Area of infill on the southern boundary of the site;
- Area C - Area of infill along the south east margin of the valley;
- Area E – Marled field;
- Area F - Area of possible infill to the north of the confluence of the Aldhurst Valley Stream and the Leiston Beck;
- Borehole abstraction pump house (Appendix B); and
- Underground irrigation pipes and field drainage (Appendix B).

3.4 Site Investigations

3.4.1 Previous Investigations

Three main periods of investigations have been undertaken at the Aldhurst Farm site. Initial investigations were undertaken by RHDHV between 2010 and 2012; additional works have been undertaken by AMEC in March 2014 and October 2014. In summary the investigations comprised:

2010 to 2012 (RHDHV, 2012)

- Soil augering (HA1 to HA8 and HA101 to HA130) to obtain samples for soil nutrient analysis;
- Construction of 17 boreholes twelve of which (BH1 to BH12), were completed as monitoring boreholes;
- Groundwater level monitoring (October 2010 to October 2012);
- Groundwater (Boreholes BH1 to BH5) and surface water quality monitoring (Aldhurst Valley and the Leiston Beck).

March 2014 (AMEC)

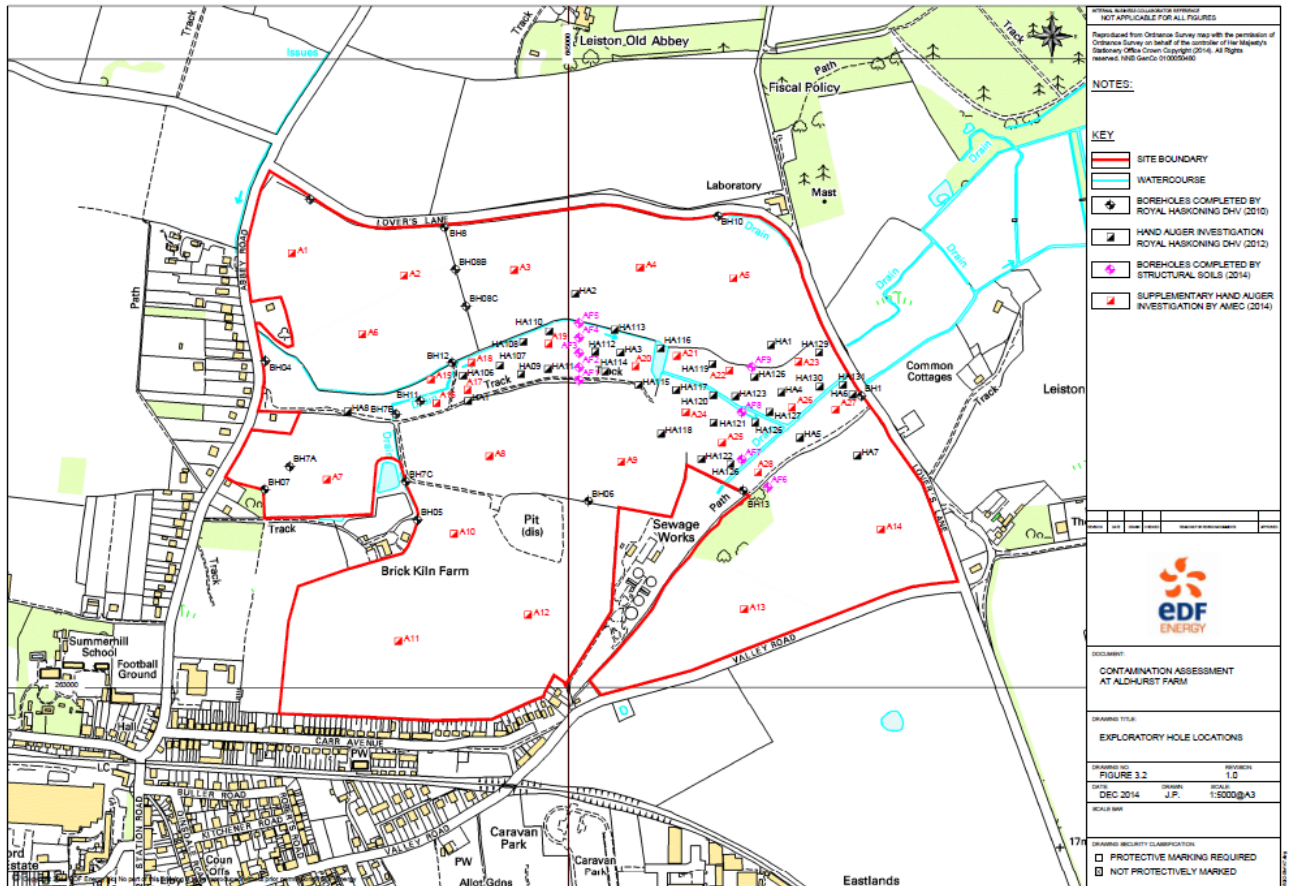
- Construction of 9 additional boreholes (AF1 to AF9) including sampling of peat for chemical analysis;
- Weekly monitoring of groundwater levels in March 2014.

October 2014 (AMEC)

- Soil survey of the site including further soil augering and sampling for chemical analysis, locations of the investigation boreholes are shown on Figure 3.2.

The investigations were focussed on the valley area to determine the characteristics of the deposits that would be excavated as part of construction of the groundwater basins. Additional auger holes were undertaken across the wider site to establish ground conditions. This was supplemented by a soil survey to establish the agricultural classification and to assess their suitability for incorporation of the soils excavated from the basins. No investigation was undertaken of the closed landfill (Area A) as no excavation works or soil placement is planned for this area.

Figure 3.2 Exploratory Hole Locations



3.4.2 Soil Chemical Analysis

As part of the investigation by RHDHV soil samples were obtained from 22 locations (0.3 to 2 m depth) for chemical analysis and tested for a range of parameters which targeted soil nutrient analysis. The analysis suite comprised:

- pH;
- Total nitrogen;
- Extractable phosphorous;
- Extractable potassium, magnesium, sodium;
- Available calcium carbonate;
- Organic matter (gravimetric); and
- Electrical conductivity.

Made ground was identified at one location (HA118, Area C) which was tested for polycyclic aromatic hydrocarbons (PAHs) and asbestos containing materials.

Peat samples were obtained in the March 2014 investigation for leaching tests (trace metals) and analysis of iron, sulphur and pyrite to support an assessment of the acid generation potential of this deposit (Chapter 5). Further shallow soil samples (21 No) were obtained in October 2014 and analysis for:

Suite A – (General contaminants suite) (10 samples):

- pH;
- Heavy metals (As, Cr, Cd, Pb, Hg, Se, Cu, Ni, Zn) ;
- Water soluble sulphur and total sulphur;
- Chloride;
- Total nitrogen and ammonium;
- Available calcium carbonate;
- PAHs;
- Asbestos containing materials (Made Ground only); and
- Organophosphorous and organochlorine pesticides.

Suite B - (Nutrients) (11 samples):

- pH;
- Total iron, total sulphur, Total pyrite, FeS (pyritic sulphur), total nitrogen;
- Extractable potassium, magnesium, sodium, phosphorous;
- Available calcium carbonate; and
- Organic matter (Gravimetric).

The results of soil analysis are included in Appendix A and described in Chapter 4.

3.5 Additional Information

The Environment Agency at a meeting on the 6 November 2014, identified that sediment cleared from the Leiston Beck and WWTW is spread on the adjoining fields and may contain sanitary waste. This may relate to Area F (Section 6.2.2).

4 CONCEPTUAL SITE MODEL (CSM)

4.1 Introduction

This chapter provides a summary of the conceptual site model (CSM) for the site, specifically, the topography, land use, soil chemical analysis, geology, hydrogeology and hydrology. These sections support the risk assessment in Chapter 6 (which presents the source-pathway-receptor situation for the site). Further details of the CSM are provided in the Design Statement.

4.2 Site Setting, Topography and Land Use

The Aldhurst Farm site is situated at National Grid Reference TM449633, immediately to the north-east of Leiston, Suffolk and covers an area of approximately 67ha.

It is bounded by Lover's Lane to the north and east; by Valley Road to the south-east; and residential areas in Leiston and along the B1122 to the south and west, respectively. The Aldhurst Valley Stream crosses the site from west to east and joins the Leiston Wastewater Treatment Works (WWTW) Drain to form Leiston Beck in the lower valley, just upstream of Lover's Lane.

The site is not a designated nature conservation site and is not located within any landscape designation, however it is located immediately to the west of Sizewell Marshes SSSI and the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB).

Topographically, the valley floor lies at elevations between 1.5 and 5 mAOD, with the land rising to the north, south and west to elevations of over 15 mAOD. The valley site is relatively flat, the majority of the lower valley floor lies between 1.75 and 2.25 mAOD. In the middle section of the main valley, upstream of the former irrigation pond, ground elevations are between 2.25 and 3 mAOD. In the upper valley ground elevations are between 3 and 5 mAOD.

In the middle of the valley, there is the pump house which comprises a concrete shed with a corrugated asbestos roof. This, together with two above ground steel tanks and a series of adjacent abstraction well-points, is connected to an irrigation system. The adjacent pond (referred to in this report as the 'former irrigation pond') in the valley was originally created to provide a reservoir for spray irrigation. This is no longer used and is overgrown with reeds.

A second pond lies to the north of Brick Kiln Farm, just outside the site boundary and is elevated compared to the surrounding land. The pond was constructed artificially and it is understood to be spring-fed.

A restored landfill (Aldhurst Farm Pit, former clay pit – Area A) is located in the southern central part of the site. A closed landfill (Abbey Pit – Area G) is located just outside of the north east boundary of the site, and a second closed landfill (Carr’s Pit – Area D), is located just outside of the south east boundary of the site. A former gas works (now demolished), was located approximately 60m to the south of the southernmost boundary of the site.

4.3 Site Soils and Geology

A soil survey has identified that the soils on the Aldhurst Farm site are typically sandy loams or loamy sands and can be mainly classified as Agricultural Land Classification Grade 3B (or lower).

The BGS geological map indicates that the northern part of the site and areas in the south-east and south-west are underlain by Quaternary sands and gravels of the Lowestoft Formation. A narrow band of Lowestoft Till outcrops on the high ground to the south of the valley. Peat deposits are mapped within the majority of the valley floor.

Auger holes and boreholes have shown that the valley is underlain by a combination of topsoil (ranging from sand to silt to clay), peat, clay, organic clay and sands. In the upper part of the valley the shallow deposits are mainly sands and clays with some peat below these at depths of 1-2 metres below ground level (mbgl). In the middle and lower parts of the valley peat deposits, typically 0.5 – 1 m thick, are present beneath the topsoil. Outside of the valley soils are typically sandy loams/sandy loams, overlying sand.

Made Ground was identified in auger holes HA118 (to a depth 1.6 m) (Area C, Figure 3.1) and A13 (to a depth of 1 m) (Area B shown on Figure 3.1).

To the east of Lover’s Lane and within the Sizewell Marshes SSSI valley, BGS borehole logs indicate that the thickness of peat deposits ranges between 1 and 2.3 m.

The solid geology below the site is the Quaternary Crag Group which comprises mainly fine-grained buff to brown, locally shelly, micaceous sands with local rounded flint gravels, up to 60 m thick. Within the Crag a layer of Chillesford Clay is mapped as a small, narrow band in the north-west of the site.

4.4 Soil Chemical Analysis

As part of the investigation by RHDHV soil samples were obtained from 22 locations for chemical analysis (Table 4.1).

The pH of soils across the site ranged from pH 5.4 to 8.4 units, with approximately 60% of the samples being mildly acidic and 40% mildly alkaline. The mean pH was 7.3 (approximately

neutral). The lower pH results were generally associated with peaty soils. Loss on ignition (LOI, an indicator of organic content) values across the site ranged from 6.6 to 79.6%. Generally, the highest values (30 –80%) were associated with peat soils, with lower values (less than 15%) associated with clays, silts and sands. Levels of nitrate were high in most soil samples which is consistent with arable cropping land use and the application of fertilisers.

The highest percentages of Total Nitrogen were found in the peaty deposits; whereas Total Nitrogen was generally close to, or below, the limit of detection in the deeper sandy samples. Higher concentrations of available phosphorus and potassium were generally found within the clayey deposits with lower and similar concentrations found in the peat and sands. Carbonate alkalinity was relatively low and typically less than 200 mg/kg.

Analysis of a sample of Made Ground (HA118) found no asbestos containing materials, but detected PAHs (total PAH 2.7 mg/kg).

As part of the March 2014 investigation, samples of peat were obtained from boreholes AF3, AF4 and AF7 to characterise the potential for generation of acidic drainage including the analysis of total iron, sulphur and pyrite. Leaching tests of the peat samples were also undertaken. The results are summarised in Table 4.2.

Table 4.1 Results of Soil Analysis Undertaken 2010-2012 (Royal Haskoning DHV, 2013)

Determinand	Minimum	Maximum	Mean
pH	5.4	8.4	7.28
Sulphate (mg/l)	<8	802	80
Chloride (mg/kg)	5.34	461	91.3
Soil organic matter (%)	<0.35	66.2	20.6
Alkalinity as CaCO ₃ (mg/kg)	34.9	698	152.1
Loss on ignition (%)	6.61	79.6	23.78
Conductivity uS/cm	1860	2800	2100
Calcium (mg/kg)	510	29300	11173
Sodium (mg/kg)	<7	1630	172.3
Total Nitrogen (% dry weight)	<0.05	2.3	0.7
Available potassium (mg/l)	22	182	65.5
Available phosphorous (mg/l)	2.4	48.2	17.4

The analysis indicated high concentrations of sulphur (~0.5%), iron (~1.1%) and pyrite (0.4%) indicating the potential for generation of acidic leachate from the peat on exposure to the air. Heavy metal concentrations were very low or below detection limits (Chapter 6).

In the October 2014 investigation, additional peat samples were obtained from leaching tests and analysis of total iron and sulphur. The results are summarised in Table 4.3 and are consistent with results presented in Table 4.2.

A full set of chemical results is given in Appendix A, including the results of analysis for pesticides for which concentrations were below or at the limits of detection.

Table 4.2 Results of Soil Analysis of Peat Undertaken in March 2014

Determinand	Minimum	Maximum	Mean
Soil Analysis			
Total sulphur %	0.23	0.690	0.48
Total pyrite %	0.16	0.61	0.4
Total iron %	0.7200	1.47	1.14
Leaching Tests			
pH	6.75	7.12	7
Chloride	14	47	21
Sulphate	23	73	57
Arsenic	1	20	6
Cadmium	<1	<1	<1
Copper	3	16	7
Lead	<1	36	9
Mercury	<0.01	<0.01	<0.01
Nickel	3	17	7
Zinc	10	23	16

Table 4.3 Results of Soil Analysis of Peat Undertaken in October 2014

Determinand	Minimum	Maximum	Mean
Soil Analysis			
Total sulphur mg/kg	0.22	3.4	1.8
Total iron %	1.1	3.3	2.08
Leaching Tests			
pH	6	6	6
Chloride	7	16	11
Sulphate	170	190	180
Arsenic	2	15	9
Cadmium	<1	<1	<1
Copper	3	3	3
Lead	<1	36	9
Mercury	<0.01	<0.01	<0.01
Nickel	5	5	5
Zinc	9	11	10

4.5 Hydrology

The long term average (LTA) rainfall for the Aldhurst Valley site is 610 mm/year (AMEC 2014a).

The valley is drained by the Aldhurst Valley Stream which feeds the Leiston Beck. The outfall from the Leiston WWTW also feeds into the Leiston Beck at its confluence with the Aldhurst Valley Stream. The Leiston Beck flows under Lover’s Lane via twin culverts at the north-east boundary of the site.

It is understood from the landowner that the field west of the pump house is drained by land drains (about 1m depth). The remaining fields are free draining.

The surface water catchment to the Leiston Beck (to Lover’s Lane) covers an area of about 3 km² (RHDHV, 2013). Monitoring at a gauge upstream of Lover’s Lane, recorded flows of 20 to 60 l/s and indicated a gain in flows as a result of the WWTW discharge and groundwater discharge to the watercourse.

Bed elevations in the watercourses fall from 5.5m AOD in the Aldhurst Valley Stream in the extreme west of the site to -1 m AOD in the Leiston Beck at Lover’s Lane. The channel bed

elevations are generally 1 - 1.5 m lower than the adjacent valley floor ground levels. Stream levels are also below groundwater levels.

The Aldhurst Valley is subject to flooding and lies within Floodplain Zone 3.

4.6 Hydrogeology

The Crag Formation is classified by the Environment Agency as a Principal Aquifer. The Lowestoft Sands and Gravels are classified as a Secondary A aquifer.

Groundwater flow below the valley is to the east. Groundwater levels fall from 3.5 m AOD (3 mbgl) at the western edge of the valley (BH4) to 1.3 AOD (0.2 mbgl) at the eastern edge of the valley (BH1). Groundwater levels in the sands and gravels are similar (within 0.05 m) to the underlying Crag indicating good hydraulic continuity between these aquifers.

Seasonal variation in groundwater levels in the valley bottom is relatively subdued, at around 0.25 m; greater variation (around 0.5 m) is seen in BH4 at the top of the valley.

There is one licensed groundwater abstraction located within the site which is used for spray irrigation.

There are also two public water supply (PWS) abstractions within 3 km of the site both of which are operated by Essex and Suffolk Water: Leiston PWS, located 2 km south-west of the site, and Coldfair Green PWS located 3 km south-west of the site. The site lies outside of the Source Protection Zones to these sources.

4.7 Water Quality

Surface water sampling in the Leiston Beck next to Lover's Lane (SW1) (RHDHV, 2013; AMEC, 2014) indicates that water quality is impacted by the WWTW with elevated concentrations of nitrogen (nitrate), phosphorus and potassium. pH values for surface water varied from 7.5 to 8.8 (mean 8.1). Dissolved oxygen concentrations in surface water were also low and electrical conductivity was low and typically less than 2 500 uS/cm.

The Leiston Beck downstream of Lover's Lane is classified as moderate ecological quality based on dissolved oxygen and physico-chemical parameters.

Groundwater samples (BH1) (eastern edge of valley) are characterised by chloride concentrations typically about 100 mg/l and sulphate in the range 100 to 200 mg/l. Samples for borehole BH4 (top of the valley) were characterised by variable high chloride and sodium concentrations which indicate drainage of road run-off to groundwater. The pH for groundwater typically ranges from 6.5 to 8.6 (mean 7.3). The groundwater samples showed marginal

exceedances of the EQS for ammoniacal nitrogen, total cyanide, cadmium and chromium, but these are not considered to be significant.

The monitoring data show no evidence of contamination that could be associated with the closed landfill sites or other potential sources of contamination.

5 POTENTIAL FOR ACID GENERATION

5.1 Introduction

The habitat creation works will involve excavation of peat and its use within the basins to create a suitable substrate for reeds in areas where the basins would be founded on sand. Excess peat which is not required for this purpose, will be used as a soil conditioner through incorporation into in-situ soils across the wider Aldhurst Farm site.

Under anaerobic conditions the pH of peat is neutral, but on exposure to the atmosphere, oxidation of pyrite can lead to the release of sulphate, iron and an increase in acidity. It is this property that makes this material ideal for its use as a soil conditioner to reduce soil fertility and pH. However, this needs to be balanced and managed as drainage from the application areas could pose a potential risk to surface water and groundwater.

Approximately 83,000 m³ of soils (unbulked volume of top soil, peat, clay and sand) will be placed on and incorporated into fields outside of the valley. The available area for spreading is about 43 ha giving a typical placement depth of 150mm for peat and 200 to 250mm for other soils (top soil, clay, sand) above the surface with incorporation being up to 300 mm below the existing soil surface.

The use of peat has an advantage as a soil conditioner as this would facilitate the creation of heathland due to the reduction of soil pH and fertility.

5.2 Previous Studies

Information on the acid generation potential of peat is available from heathland creation trials (ADAS, 2010) where peat was used as a soil conditioner.

Analysis of samples from boreholes drilled as part of a 2010 investigation (Structural Soils, 2009) of the proposed Sizewell C site, identified that the concentrations of pyrite in peat were typically about 0.8%. Based on this pyrite content, ADAS (2010) concluded that the peat would be suitable for use in trials to assess the feasibility of creating heathland. The peat was characterised by a high salinity reflecting the proximity of the Sizewell C site next to the coast.

In 2010, ADAS undertook a trial in which peat was excavated from depth from the proposed Sizewell C power station site, transported to the trial site and incorporated into sandy farmland soils to try and create conditions amenable for creation of heathland. As part of ADAS study, soil samples from the extracted peat and trial plots were taken prior to incorporation.

Three trials were undertaken. The first comprised laying a 250 mm thick layer of peat onto farm land soil and mixing this to a depth of 450 mm (with the maximum depth of incorporation being around 250 mm below original ground level) giving a 1:1 mix of peat to soil. A second trial was undertaken using a 250 mm layer of peat/clay and provided a 1:2 mix of peat to soil. The third was a control trial with not peat addition.

Following incorporation of peat and organic clays, ADAS monitored the pH of topsoil in the trial plots on a monthly basis from September 2009 to March 2010. During this period, the pH in plots where peat was incorporated declined from pH 6.0 to values in the range of pH 3.0 to 3.3. The pH of topsoil in plots in which the peat-clay mix was added decreased from pH 6.0 to 7.0 to pH 5.0 to 6.0. It was concluded that the mineral fraction of the peat-clay mixture acted to buffer the pH.

Heather brashings were spread over the trial plots which were subsequently monitored for the development of heathland. The peat only trial was found to be unsuccessful, but the clay/peat (and to a lesser degree the control plot) were successful with the establishment of acid grassland and heather. Failure of the peat only trial was attributed to the very low pH (3 to 3.3) of soils.

During the same monitoring period, the quality of drainage water leaching at a depth of 0.9 m below the trial plots was also recorded. The pH of drainage water from both the peat and the peat-clay trial plots was found to be relatively stable during the period December 2009 to March 2010, following which an increase to more neutral/alkaline conditions was observed. The pH of drainage water from the peat plot was >5.0, compared to around 3.0 in the overlying soils, suggesting that some buffering of pH had occurred.

The drainage was also characterised by high sulphate (3 000 to 4 000 mg/l) and chloride concentrations (1 500 to 2 500 mg/l) which were observed to decrease over time. The high chloride concentrations are attributed to the location of the excavation area for the trial being close to the sea leading to high inherent salinity in the peat material used in the trials.

5.3 Analysis of Peat Samples from Aldhurst Farm

Analysis of peat samples from the Aldhurst Stream Valley (Table 5.1) indicates that the peat is characterised by lower chloride, total sulphur and total iron concentrations (Table 5.2) than the samples of material used in the ADAS trials. This is a reflection of the fact that the peat deposits in the valley are near surface (1 to 2 m) and within the zone of water table fluctuation and have

therefore been subject to a degree of aeration and leaching/flushing by surface water and groundwater. As a result the acid generation potential for this material will be lower.

Leaching tests on peat soils from Aldhurst Farm under neutral conditions indicate the concentrations of chloride and sulphate in drainage would be less than 100 mg/l and mean metal concentrations would be below Environmental Quality Standards (EQSs) (see Table 5.3). On disturbance and aeration of the peat, concentrations of sulphate would be expected to increase as a result of oxidation of pyrite and a decrease in pH. This change in pH may increase the mobility of trace metals, but this would be dependent on the buffering capacity of the soils. The sand and gravels underlying the Aldhurst Farm site are characterised by a high carbonate content and therefore high buffering capacity.

Table 5.1 Comparison of Soil Analysis for Peat Samples from Aldhurst Valley and the Sizewell C Site

Material	pH	Total Fe (%)	Total S (%)	Total pyrite (%)	Available SO4 (mg/l)	Water Soluble Cl (mg/kg)
ADAS (2010) (mean with standard error shown in brackets)						
Peat	6.3 (0.27)	3.75 (0.74)	3.57 (0.73)	ND	3995 (381)	2647 (762)
Peat/Clay	7.2 (0.23)	2.74 (0.17)	1.71 (0.17)	ND	5688 (589)	3592 (679)
Aldhurst Valley (mean and range)-						
Peat	5.9 (5.2 to 7.3)	1.8 (0.72 to 3.3)	1.6 (0.08 to 3.4)	0.4 (0.05 to 0.78)	40 to 800	100 to 460

ND No data

Table 5.2 Results of Soil Analysis of Peat from Aldhurst Valley

Determinand	Number of Samples	Minimum	Maximum	Mean
pH	11	5.2	7.3	5.9
Total sulphur (%)	15	0.08	3.4	1.6
Total iron (%)	15	0.72	3.3	1.8

Table 5.3 Results of Leaching Tests of Peat Samples from Aldhurst Farm

Determinand	Number of Samples	Minimum	Maximum	Mean	EQS
pH	6	6	7.12	6.7	
Chloride mg/l	6	7	47	18	250
Sulphate mg/l	6	23	190	99	400
Arsenic ug/l	6	1	20	7	50
Cadmium ug/l	6	<1	<1	<1	0.15
Copper ug/l	6	3	16	6	10
Lead ug/l	6	<1	36	6	7.2
Mercury ug/l	6	<0.01	<0.01	<0.01	0.05
Nickel ug/l	6	3	17	7	20
Zinc ug/l	6	9	23	14	75

Data on the concentrations of metals in peat is available from the ADAS trials (summarised in Table 5.4) which demonstrate that metals concentrations are not an issue of concern with respect to human health risk. The screening criteria (GAC) selection (public open space and residential without gardens scenarios) are discussed in Section 6.7.

Table 5.4 Metal Concentrations in Peat (ADAS, 2010)

Determinand	Mean	Standard Error	GAC Public Open Space
Arsenic mg/kg	31.5	15.1	35
Cadmium mg/kg	0.31	0.11	120
Chromium	<10		19500
Copper mg/kg	3.5	0.77	11000
Lead mg/kg	7.1	0.62	310 ¹
Mercury mg/kg	<0.02		260
Nickel ug/l	<10		790
Zinc mg/kg	13	0.57	40000

¹ GAC residential without plant uptake

5.4 Use of Peat

The ADAS trial has shown that where peat is to be spread and incorporated into soil the maximum depth of peat placement should be 150 mm and that this layer should be mixed into a depth of 450mm (equivalent to 300 mm below existing ground level) to provide a peat to soil mix of 1:2.

Aldhurst Farm is underlain by the Crag. This deposit is characterised by relatively high calcium carbonate content (6 to 17%, Structural Soils, 2014) and therefore has a high pH buffering capacity. Acidic drainage from areas of peat incorporation is therefore very unlikely to impact groundwater quality.

Surface water run-off may present a potential issue on steeper slopes and a potential risk to surface water quality. The following measures are therefore proposed as part of the Materials Management Plan:

- Peat not to be used on steeper slopes (>1 in 10) or within 75m of the Aldhurst Valley Stream, Leiston Beck or Brick Kiln Farm reservoir. This is to minimize risk to surface water from any acid leaching;
- After application to land, the depth of peat and depth of mixing in the soil will be determined. The pH value of the soil will ideally be between 5 and 6, if values are significantly different then the depth of peat may be reduced (pH <4.5) or sulphur added (pH>6.5);
- Soils within application areas to be mixed within two weeks of placement, subject to weather conditions, to open the soil structure and minimise runoff;
- Harrowing and seeding to be undertaken within 2 weeks of mixed, subject to weather conditions. In areas with a higher risk of erosion, hydroseeding will be employed;
- A temporary interception ditch network to be incorporated downslope of soil spreading areas, if required;
- Soils will not be spread during and following intense rainfall events where there is a higher risk of soil run-off; and
- Surface water monitoring of the Leiston Beck will be carried out during the works and analysed for pH, suspended solids and electrical conductivity.

6 RISK ASSESSMENT

6.1 Introduction

This chapter identifies potential sources of on-site and off-site contamination. These have been assessed in terms of the potential constraints that they may represent to the habitat creation and landscaping proposals and the mitigation measures that may be required.

Contamination potential may be anthropogenic (e.g. closed landfill sites) or natural (e.g. acid generation resulting from disturbance of peat) in nature. The location of potential contaminant sources on and within the immediate vicinity of the site are shown in Figure 3.1 and upon the plan included with Appendix B

6.2 Potential Sources of Contamination - Valley Site

6.2.1 Area C – Historical Landfill (unrecorded)

Figure 3.1 shows the location of two features identified as C and F. Area C is a former council landfill, which, according to the current landowner, was infilled in the early 20th century with glass, ceramic, pottery and other non-deleterious material. This is supported by evidence from the site walkover survey, where fragments of the waste were observed on the ground surface, across an area of approximately 2 500 m². An auger hole (HA118) confirmed Made Ground (1.1 m thick). Chemical analysis for the fill is included in Appendix A.

However, given the age and apparent composition of the waste, organic and volatile contamination is considered unlikely. Inorganic contaminants, e.g. metals, may be present, consistent with data from infill (Area B) from the wider site.

6.2.2 Area F – Possible Historical Landfill (unrecorded) or Area of Waste Spreading

A small area of scattered glass and pottery/ceramic fragments was observed (Area F) (Figure 3.1). The landowner indicated that this may have originated from the adjacent ditch during clearance of the sediments and placement onto the field. Hand augering in the vicinity did not indicate the presence of in-situ fill and it is therefore unlikely to be a significant source of potential contamination.

The Environment Agency (Section 3.5) indicates that sediment from the Leiston Beck and WWTW ditch is spread on the adjacent banks and can contain sanitary waste.

6.2.3 Pump House

A small pump house is located at the centre of the Valley site, as shown in Appendix B. The roof is constructed of corrugated bonded asbestos. However, the roof appears to be in reasonable condition and is therefore very unlikely to be a source of surrounding ground contamination.

6.2.4 Underground Field Drainage

Appendix B shows the indicative locations of underground field drainage pipes in the westernmost valley field (Basin A). The field is prone to flooding and thus pipes were installed by the current landowner to drain the field to the stream to the north. The pipes are constructed of 6" to 10" perforated plastic and are approximately 4 feet deep. The landowner indicated that after installation of the westernmost pipe (10" diameter), the trench was backfilled with rubble, sourced from building sites in Leiston. It is understood that the pipes are currently blocked and are therefore redundant. The rubble composition and nature is not known and may be a source of inorganic contamination, although considered unlikely to be significant.

6.2.5 Underground Irrigation Pipes

Appendix B shows a network of 6" underground irrigation pipes across the Aldhurst site. The approximate locations of these have been provided by the landowner. Installation records confirm that the pipework leading from the pump house to the west is of 'fibrous cement' construction and therefore it is possible that there may be some asbestos content. All other irrigation pipes are believed to be of plastic construction.

6.3 Potential Sources of Contamination - Wider Aldhurst Site

6.3.1 Area A – Aldhurst Farm Historical Landfill

Aldhurst Farm Pit (former clay pit), is a closed landfill site located to the south of the valley (Figure 3.1). This pit received household, industrial, commercial and inert waste between 1990 and 1996. The Environment Agency accepted surrender of the waste licence (Licence No. 70716) in 2006 indicating acceptance that the site does not represent an environmental risk. The area has been restored with a covering of grass, shrubs and trees.

6.3.2 Area B – Historical Landfill (unrecorded)

The approximate size and location of Area B is shown on Figure 3.1. Evidence from the site walkover survey and subsequent details provided by the landowner indicated that infilling probably took place in the 1930s to 1950s, the infill comprising glass bottles, ceramic, tiles and bricks. The presence of fill was confirmed by an auger hole (A13) which encountered topsoil containing glass, ceramic, porcelain and flint to a depth of 0.5 m. Below this layer (to a depth of

1 m) was red, brown, grey and black mottled ash, with glass, pottery and charcoal fragments. The results of chemical analysis of the ash are included in Appendix A.

6.3.3 Area E – Marled Field

The field marked E was marled by the current landowner to improve soil cohesion in order to aid farming. The marling process involved importing clay from local off-site sources and mixing into the topsoil. The results of soil analysis are included in Appendix A and no contamination issues identified. The soils within Area E were determined to be loamy sand based on the AMEC site investigation in October 2014. No contaminants were identified by testing, therefore this potential source is not considered significant and will not be considered further.

6.4 Soils and Peat

The habitat creation scheme involves the excavation of topsoil, peat, sand and clay and its incorporation over the wider Aldhurst Farm site. Soil samples have been obtained to characterise the excavated material and its suitability for spreading and incorporation in soils (Section 4.4).

The excavation and disturbance of peat has the potential to for acid generation and this is assessed in Chapter 5. This assessment has concluded that with appropriate management measures, peat can be used for beneficial use without any risk of contamination.

6.5 Potential Off-Site Sources of Contamination

The surrounding area contains a number of potential contamination sources, including a number of infilled former sand and clay pits and a former gas works.

6.5.1 Area G - Abbey Pit (Historical Landfill)

The location of Abbey Pit historical landfill is shown on Figure 3.1. The pit is identified on the Environment Agency website but no details pertaining to the nature and dates of waste received are available.

6.5.2 Area D - Carr's Pit (Former Brick Pit – Historical Landfill)

This pit received inert and industrial waste between 1976 and 1987. This area is currently covered by dense vegetation. Anecdotal information from the Aldhurst Farm landowner suggested that the pit received foundry waste and sand from the nearby works. Potential contaminants may therefore include metals and inorganic substances.

6.5.3 Area H – Former Gas Works

A former gas works site has been identified on the available historical maps for the period 1927 and 1977. The works was situated approximately 60m to the south of the southernmost boundary and some 600m from the Valley site. The two holding tanks and associated infrastructure were demolished sometime between 1977 and 1986 and the area is currently occupied by grassland/overgrown vegetation. Due to the distance from the site, it is considered unlikely that significant contamination of the Aldhurst site would have occurred and highly unlikely to have impacted the Valley site given the distance to the valley and as it is not located down hydraulic gradient of the valley. This is confirmed by the results of groundwater monitoring.

6.6 Potential Receptors

Potential receptors at the Aldhurst Farm site include the following:

- Humans - current and future users of the site (including farmers, site visitors/ workers, construction workers employed on the site as part of valley soils works, and the public);
- Controlled Waters – Groundwater within the Principal and Secondary A and aquifers;
- Controlled Waters – Surface waters; and
- Ecology/ Amenity: flora and fauna.

The risks to these receptors are considered in the sections below.

6.7 Human Health

Current human receptors include contract farmers and other contractors, current landowners, site visitors and the public (in relation to the public right of way leading from the sewage works).

Future site users are likely to comprise EDF Energy staff and associated contractors, and the public (both in relation to the above public right of way and other areas of the site that may potentially be made accessible for quiet public recreation in the future).

Potential pathways to human receptors are by direct contact, ingestion and dust inhalation.

In order to provide an assessment of risks to humans presented by any contaminants identified within the surface materials at the site, a human health Generic Quantitative Risk Assessment (GQRA) has been undertaken. The GQRA involves comparing contaminant concentrations observed at the site with appropriate Generic Assessment Criteria (GAC). A GQRA forms Tier 2 of the tiered approach to assessing risks from land contamination as set out in CLR11. GAC may

be viewed as trigger values, above which further consideration of the significance of the data and the potential risk is required. Concentrations recorded in excess of their respective GAC do not necessarily indicate unacceptable risks.

To perform a GQRA, contaminant concentrations in soil are compared with relevant GAC. GAC are available (for some contaminants) for various defined exposure scenarios. Considering the nature of the current site configuration and the proposed end-use, the most relevant GAC are considered to be those for public open space. Where GAC are not available for certain determinands, the next most suitable GAC has been used i.e. residential without plant uptake, which by nature, are more stringent screening criteria in terms of public open space.

With the exception of lead, all GAC used for the assessment of risks to human health, for selected substances in soils, have been derived using the 'Contaminated Land Exposure Assessment' (CLEA) model. The GAC for lead in a public open space scenario does not currently exist and therefore the residential without plant uptake GAC is substituted as a conservative assessment criterion for the proposed end use.

GAC for organic contaminants are dependent on the soil organic matter (SOM) content of the source material, with higher GAC generally associated with higher SOM content. However, the SOM can be affected by the presence of organic contaminants. The organic content of soils at the site typically exceeds 1% (notably peaty soils) and therefore the most conservative GAC based on 1% SOM have been used.

The contaminant results from the laboratory analysis have been compared to their associated GAC. This GQRA is presented in Appendix A. The exceedances of the GAC are highlighted on the GQRA sheets.

The soils tested from the Aldhurst Farm site are characterised by concentrations below GAC. The exception is a sample of fill (ash) from auger hole A13 (Area B) which recorded exceedances for arsenic and lead.

Some site data are available on heavy metal concentrations of the peat and data are also available from the ADAS study (Table 5.4). The data indicate concentrations are below GAC. Leaching tests of the peat (Table 5.3) provide supporting data that metal concentrations are low. Analysis of peat soils (Structural Soils, 2009) found the following:

- VOCs and SVOCs not present at concentrations greater than method detection limit in any samples;
- Metals and other inorganics present at low concentrations and consistent with the ADAS data;

- TPH concentrations below method detection limit in the majority of samples, with infrequent detectable concentrations; and
- Concentrations of PAHs were below detection limits in the majority of samples, with a limited number of relatively low concentrations reported. The maximum recorded soil concentration for Total PAH was 5.9 mg/kg. The lowest GAC for an individual PAH is 1.5 mg/kg for Benzo(a)pyrene.

Previous analyses of peat confirm that its use as a soil conditioner does not represent a risk to human receptors. Additional samples will be obtained to confirm its chemical characteristics.

Area A has been restored and it is not proposed to undertake any works in this area (e.g. soil excavation).

The construction works may result in disturbance of infill in Area C (adjacent to Basin C). This material is reported to be mainly glass, bricks and tiles. As part of preparation for the site works, trial pits should be excavated to better define the depth and extent of this fill. If this material is excavated as part of the works, it should be segregated for inspection and treatment prior to any use proposals being determined.

The infill in Area B underlies a field used for agriculture. The typical depth of mixing is 200 to 300mm which has resulted in some disturbance of the fill. Placement of a layer of subsoil over this area as part of the use of excavated soils from the groundwater basins would provide a benefit in providing a clean cover layer.

Analysis of the samples of fill (HA118, Area C and A13, Area B) did not identify any asbestos containing material.

It is also noted that the underground irrigation pipework running from the pump house to the west is reported to be of fibrous cement construction. As part of the construction preparation works trial pits will be excavated to obtain samples of the pipe work for testing to confirm this does not contain asbestos containing material (ACM).

Transient risks to groundworks and site maintenance contractors are likely to be mitigated by the adoption of appropriate health and safety measures in accordance with the following legislation:

- The Health and Safety at Work etc Act 1974;
- Control of Substances Hazardous to Health (COSHH) Regulations 1988;
- HSE Guidance Note – ‘Protection of Workers and General Public during the development of Contaminated Lane HMSO 1991’; and

- The Construction (Design & Management) Regulations 1994 plus transitional implemented from 1995.

As a result, risks to groundworks and maintenance contractors are not considered within the risk assessment or conceptual model due to the assumption that suitable personal protective equipment (PPE) will be worn that will mitigate risks associated with short term exposure to contaminants. In addition, the following measures are to be followed:

- Vigilance for the presence of asbestos;
- Avoidance of dermal contact where possible, by the use of gloves;
- Avoidance of inhalation of dust where possible, by use of masks; and
- Prevention of air born dust generation, (i.e. damping down dusty work areas).

Details of relevant protective and management measures to protect human health are set out in the Construction Management Strategy.

In summary the investigations have shown that land contamination is localised and that the proposed scheme and associated management measures will protect human health.

6.7.1 Ground Gas Migration/ Accumulation

Ground gases (such as methane or hydrogen sulphide) originating from localised sources (closer landfills) or from disturbed peat deposits, may migrate and accumulate in any proposed on site structures in the future, which may present a risk of fire/ explosion without appropriate mitigation such as ventilation. No structures are proposed and therefore ground gas is not an issue. The risk to human receptors, via inhalation, is considered to be minimal as the area will be open space and no new confined spaces will be created.

6.8 Controlled Waters

There is a potential for leaching and/ or migration of contaminants to the underlying aquifers, particularly with regards to acid leachate from excavated peat and contaminants from disturbed/ stockpiled historical landfill materials.

The main pathways and risks to controlled water are:

- Leaching of contaminated soils including infill with migration via surface water run-off and/or vertical drainage to groundwater;

- Generation of acidic drainage on disturbance of peat (See Chapter 5) with migration via surface water run-off and/or vertical drainage to groundwater.

Leaching tests have been undertaken on samples of peat and the results have been compared to Drinking Water Standards (DWS) or Environmental Quality Standards (EQS) (Appendix A). Some individual marginal exceedances were identified for lead (AF7 0.2 to 0.6 m) and PAH (AF 0 to 1 m); however average concentrations are below water quality standards and are therefore not considered to be significant in relation to risk to groundwater.

Disturbance of the peat may result in acidic drainage and therefore surface water management measures will be required to protect surface water (see Chapter 5) and these are described in the Materials Management Plan and the Construction Management Strategy. Acid generation by excavated peat is unlikely to cause an impact on groundwater (Chapter 5) due to the pH buffering capacity of the solid geology (Crag). With regards to the potential risk to surface waters, it is recommended that downstream surface water monitoring is carried out during the works with analysis for pH, suspended solids and electrical conductivity (see Section 5.4).

Should excavation of former infill materials be required as part of the works (Area C), these materials will be segregated, inspected and tested prior to any use or off-site disposal.

The former gas workers is not considered to represent a risk to groundwater with the basins.

6.9 Ecology/Amenity (Flora and Fauna)

Sizewell Marshes SSSI is located to the east of Lovers Lane and is a potential receptor. The main risk to this receptor is surface water drainage to the Leiston Beck which flows through the SSSI. However the appropriate use of surface management measures during the works will ensure protection of the SSSI.

In addition to water drainage to Leiston Beck, there are other mechanisms for causing off-site contamination, such as wind-blown dust and mud adhering to vehicle tyres. Therefore, the following measures should be implemented during the construction phase;

- Dampening down surface soils and spoil heaps prior to any ground works or loading operations, to control wind-blown dust;
- Washing wheels of vehicles leaving the site;
- Restricting any leachate from flowing onto adjoining land or the highway.

7 CONCLUSIONS

The Aldhurst Farm site is currently used for agriculture. The assessment has identified a number of areas of infill within the Aldhurst Farm site (Areas A, B and C on Figure 3.1), including a closed landfill site (licence surrender accepted by the Environment Agency in 2006). Area C is located at the edge of the proposed excavation areas. A former gas works was identified 60m to the south of the southernmost site boundary, approximately 600m to the south of the Valley site. However, it is considered highly unlikely to have impacted the Valley site, although localised contamination at the former works is considered likely.

Soil sampling by Royal Haskoning and more recently by AMEC has not identified evidence of significant land contamination. The only exceedances of GAC were identified within one area of former infill (Area B).

Human receptors are primarily construction workers and end users. It is considered that the risk to construction workers from Made Ground, peat excavation (potentially), Area C excavation (potentially), irrigation pipes (potentially ACM), and asbestos pump house roof, will largely be ruled out due to the adoption of appropriate work practices and the use of PPE.

With regards to end users of the site, the potential risks may include the historical landfills e.g. Area B, where GAC exceedances for lead and arsenic were encountered. Pathways identified include dust inhalation, soil ingestion and dermal contact. Previous testing of peat in the Sizewell area has shown this material is unlikely to represent a risk to human health (e.g. heavy metal and PAH concentrations below GAC) and therefore suitable for use.

The excavation works may result in disturbance of the fill in Area C with the need to segregate this material for inspection and treatment prior to any use of disposal off-site. As part of the construction preparation works, further trial pitting would aid in better define the extent of this fill and the volume of fill that may need to be managed. No works are proposed for Area A (closed landfill). Subsoil will be placed on Area B (area of known fill) to provide a 'clean' cover layer.

The existing pump house will need to be demolished as part of the proposed construction works and the demolition material taken off site. Any asbestos containing material will be removed to a licensed site for controlled landfill disposal off site.

Trial trenching within the basins will need to be undertaken as prior to the excavation works to identify the nature and distribution of disused irrigation pipes and land drains. Any pipes containing ACM would be selectively removed so as to minimise physical contamination of soils for use.

The placement of peat from the excavation on the adjacent fields may result in the generation of acidic generation and a potential risk to surface water. However, this can be managed by

ensuring: the peat is not placed next to the Aldhurst Valley Stream or Leiston Beck and that peat is not placed on steeper slopes. Interception ditches may be required downslope of the spreading areas pending results of downstream surface water monitoring. The Crag underlying the area of peat spreading is characterised by a relatively high calcium carbonate content (6 to 17%) which would buffer any acidic drainage to groundwater.

Details of relevant protective and management measures are set out in the Construction Management Strategy.

8 REFERENCES

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APPENDIX A SOIL AND LEACHATE ANALYSIS AND GENERAL ASSESSMENT CRITERIA

Screened Soil Results (All samples) - Human Health GAC													
			Site Area:	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	
			Sample Location:	A19	HA 102/S2	HA 102/S3	HA 105/S1	HA 105/S3	HA 106/S1	HA 106/S2	HA 110/S1	HA 110/S2	HA 111/S1
			Depth:	0.9 - 1.1m	0.50-	1.00-	0.20-	0.90-	0.40-	1.10-	0.60-	1.00-	0.20-
			Date Sampled	24/09/14	05/12/2012	05/12/2012	05/12/2012	04/12/2012	04/12/2012	04/12/2012	05/12/2012	05/12/2012	05/12/2012
			Type:	Other	Sandy Clay	Silty Clay	Sand	Sand	Sandy Loam	Silt Loam	Silt Loam	Silt Loam	loamy Sand
Determinand	Units	GAC - Public Open Space 1% SOM	GAC - Residential without Plant Uptake 1% SOM										
Arsenic	mg/kg	35											
Boron (water-soluble)	mg/kg	11000											
Cadmium	mg/kg	120											
Chromium	mg/kg	19500											
Copper	mg/kg	11000											
Lead	mg/kg		310										
Mercury	mg/kg	260											
Nickel	mg/kg	790											
Selenium	mg/kg	600											
Zinc	mg/kg	40000											
Asbestos ID													
Chrysotile (White) Asbestos													
Amosite (Brown) Asbestos													
Crocidolite (Blue) Asbestos													
Fibrous Anthrophyllite													
Fibrous Tremolite													
Fibrous Actinolite													
Non-Asbestos Fibre													
Calcium Carbonate	%			4.7									
Alkalinity, Total as CaCO3	mg/kg			72.6	78	125	81.7	106	88	698	52.5	111	
Chloride	mg/kg			22.8	34.2	19	116	25.9	101	125	461	18.4	
Nitrogen (Total)	mg/kg			7050									
Nitrogen, Total*	% Dry Weight			0.1	0.1	0.1	0	0.3	1.7	0.6	1.3	0.3	
pH	pH units			5.6	7.69	7.68	8.09	8.23	7.87	6.39	7.54	5.52	7.95
(Water Soluble) SO4 expressed as SO4	g/l			<0.008	<0.008	<0.008	0.0225	<0.016	0.157	0.0946	0.802	<0.016	
Sulphur (total)	%			2.8									
Ammonia expressed as NH4	mg/kg												
Iron	mg/kg			33000									
Mg (Extractable BS 3882)	mg/l			63	102	62	23	15	50	88	51	63	50
Organic Matter	%			31.7	1.83	1.52	1.39	<0.35	3.71	59.3	11.6	36.5	3.98
Phosphorous	mg/kg			460									
Extractable P	mg/l			<10	7.4	44.4	48.2	6.8	31.2	6.6	14.4	41	22.6
K (Extractable BS 3882)	mg/l			29	93	105	106	64	122	53	91	110	73
SO4(Total)	%			1									
(Total Potential) SO4(Total) Expressed as SO4	%			8.5									
(Oxidisable) Sulphide Expressed as SO4	%			7.5									
Conductivity @ 20 deg.C	mS/cm				1.86	1.89	1.9	2.02	1.92	2.27	2.14	2.8	1.92

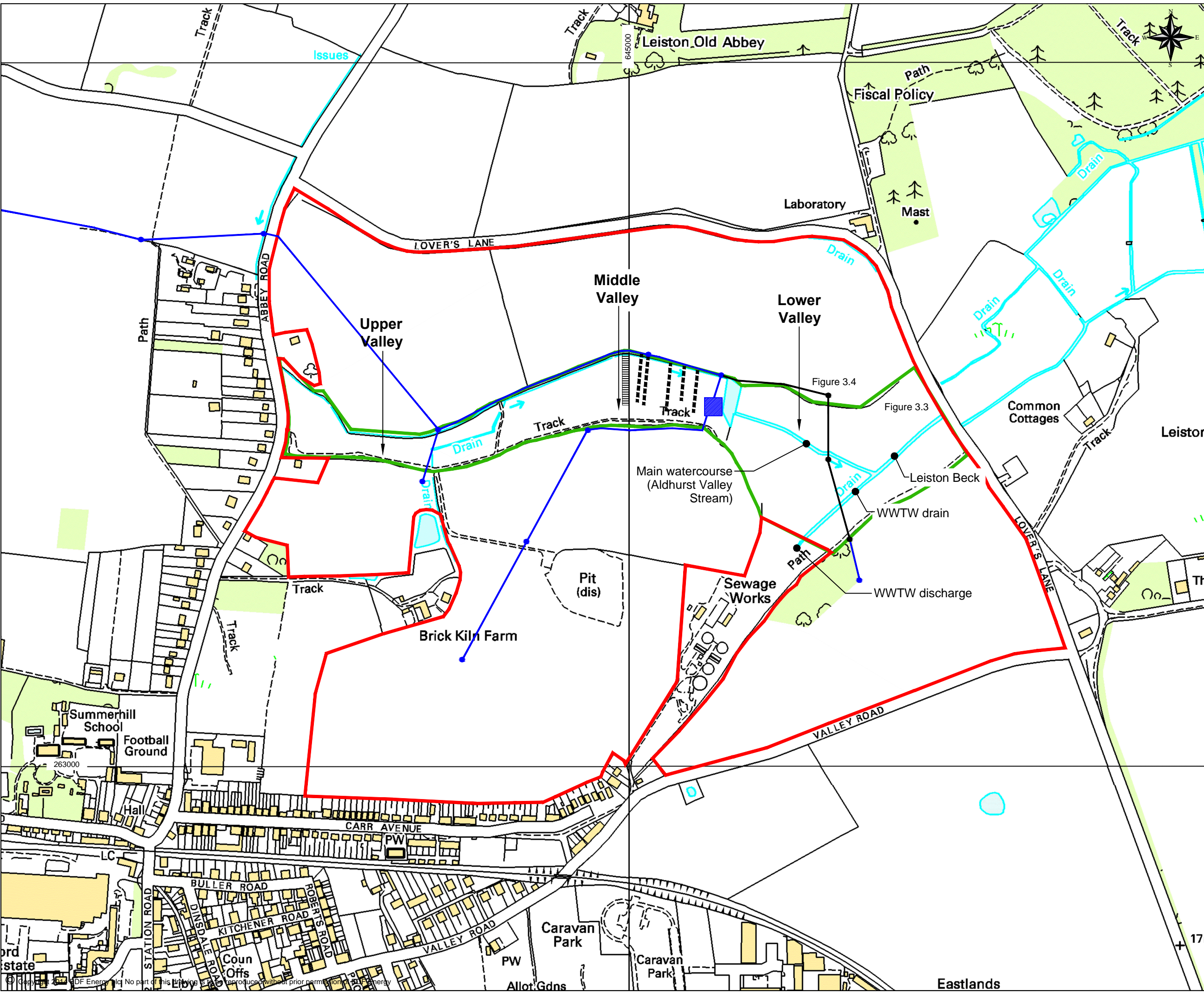
Screened Soil Results (All samples) - Human Health GAC													
			Site Area:	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	
			Sample Location:	HA 111/S2	HA 118/S1	HA 118/S2	HA 119/S1	HA 119/S2	HA 123/S1	HA 123/S2	HA 125/S1	HA 125/S2	HA 129/S1
			Depth:	0.60-	0.40-0.50	0.80-	0.50-	1.60-	0.50-	1.80-	0.50-	1.00-1.50	0.60-
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	05/12/2012	05/12/2012	06/12/2012
			Type:	Sand	Sand	Loamy Sand	Silt Loam	Sand	Silt Loam	Silt Loam	Silt Loam	Sand	Sand
Determinand	Units	GAC - Public Open Space 1% SOM	GAC - Residential without Plant Uptake 1% SOM										
Arsenic	mg/kg	35											
Boron (water-soluble)	mg/kg	11000											
Cadmium	mg/kg	120											
Chromium	mg/kg	19500											
Copper	mg/kg	11000											
Lead	mg/kg		310										
Mercury	mg/kg	260											
Nickel	mg/kg	790											
Selenium	mg/kg	600											
Zinc	mg/kg	40000											
Asbestos ID													
Chrysotile (White) Asbestos					Not Detected	Not Detected							
Amosite (Brown) Asbestos					Not Detected	Not Detected							
Crocidolite (Blue) Asbestos					Not Detected	Not Detected							
Fibrous Anthrophyllite					Not Detected	Not Detected							
Fibrous Tremolite					Not Detected	Not Detected							
Fibrous Actinolite					Not Detected	Not Detected							
Non-Asbestos Fibre					Not Detected	Not Detected							
Calcium Carbonate	%												
Alkalinity, Total as CaCO3	mg/kg			55.8	64.4	205	169	34.9	480	127	238	111	66.2
Chloride	mg/kg			47.2	5.34	19		28.7			317	50.3	179
Nitrogen (Total)	mg/kg												
Nitrogen, Total*	% Dry Weight			0.1	0.2	0.5	2.3	<0.05	1.5	1.2	1	<0.05	0.1
pH	pH units			7.5	7.57	7.55	6.62	7	7.27	6.8	7.29	7.58	7.51
(Water Soluble) SO4 expressed as SO4	g/l			0.0317	<0.008	0.0513		0.0395			<0.04	0.027	0.0742
Sulphur (total)	%												
Ammonia expressed as NH4	mg/kg												
Iron	mg/kg												
Mg (Extractable BS 3882)	mg/l			11			46	11	54	77	90	23	20
Organic Matter	%			1.44	11.5	19.1	66.2	0.95	52.9	44.7	38.8	1.97	0.395
Phosphorous	mg/kg												
Extractable P	mg/l			3			2.4	3	3.2	2.8	8.8	6.8	3.8
K (Extractable BS 3882)	mg/l			38			22	37	27	23	61	33	33
SO4(Total)	%												
(Total Potential) SO4(Total) Expressed as SO4	%												
(Oxidisable) Sulphide Expressed as SO4	%												
Conductivity @ 20 deg.C	mS/cm			1.94	1.95	2	2.28	1.93	2.24	2.62	2.31	1.93	2.08

Screened Soil Results (All samples) - Human Health GAC													
			Site Area:	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	VALLEY	
			Sample Location:	HA 129/S2	HA 131/S1	HA 131/S2	1	2	3	4	5	6 0-15	6 30-95
			Depth:	1.20-	0.50-	1.20-							
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
			Type:	Sand	Silt Loam	Silt Loam	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Determinand	Units	GAC - Public Open Space 1% SOM	GAC - Residential without Plant Uptake 1% SOM										
Arsenic	mg/kg	35											
Boron (water-soluble)	mg/kg	11000											
Cadmium	mg/kg	120											
Chromium	mg/kg	19500											
Copper	mg/kg	11000											
Lead	mg/kg		310										
Mercury	mg/kg	260											
Nickel	mg/kg	790											
Selenium	mg/kg	600											
Zinc	mg/kg	40000											
Asbestos ID													
Chrysotile (White) Asbestos													
Amosite (Brown) Asbestos													
Crocidolite (Blue) Asbestos													
Fibrous Anthrophyllite													
Fibrous Tremolite													
Fibrous Actinolite													
Non-Asbestos Fibre													
Calcium Carbonate	%						<2	<2	<2	<2	<2	<2	<2
Alkalinity, Total as CaCO3	mg/kg			69	168	84							
Chloride	mg/kg			51.6									
Nitrogen (Total)	mg/kg												
Nitrogen, Total*	% Dry Weight			<0.05	1.8	1.9	0.11	0.07	0.07	0.07	0.06	0.24	0.43
pH	pH units			7.78	6.72	6.04	6.6	8.1	8.3	7.4	6.7	7.3	7.1
(Water Soluble) SO4 expressed as SO4	g/l			0.0263									
Sulphur (total)	%												
Ammonia expressed as NH4	mg/kg												
Iron	mg/kg						15478	8653	11651	12211	12753	12033	15142
Mg (Extractable BS 3882)	mg/l			11	74	120	78	49.5	30	47	44.5	46	45.3
Organic Matter	%			<0.35	56.5	54.7	2.4	1.7	1.6	1.5	1.2	5.1	9.1
Phosphorous	mg/kg												
Extractable P	mg/l			5.4	7.2	7	43.6	45	46	51.2	32.6	28.8	16.4
K (Extractable BS 3882)	mg/l			30	36	36	160	69.5	71.3	122	119	48.4	40.7
SO4(Total)	%												
(Total Potential) SO4(Total) Expressed as SO4	%												
(Oxidisable) Sulphide Expressed as SO4	%												
Conductivity @ 20 deg.C	mS/cm			1.92		2.67							

Screened Soil Results (All samples) - Human Health GAC								
			Site Area:					
			Sample Location:					
			Depth:					
			Date Sampled					
			Type:					
Determinand	Units	GAC - Public Open Space 1% SOM	GAC - Residential without Plant Uptake 1% SOM	MAX	MIN	MEAN	No. of samples	COMMENT
Calcium	mg/kg			29300	510	11173.13	23	
Sodium	mg/kg			1630	19.7	299.47	23	
Total Sulphur	mg/kg			10390	108	1560.80	15	
Pyritic Sulphur	mg/kg			7874	94	903.07	15	
Neutralising Value as CaO	% w/w			3.1	1	2.00	15	
PAH								
Naphthalene	mg/kg	1500		0.0949	0.0949	0.0949	11	No exceedances of GAC
Acenaphthylene	mg/kg	4900		0.0238	0.0238	0.0238	11	No exceedances of GAC
Acenaphthene	mg/kg	4900		0	0		11	No exceedances of GAC
Fluorene	mg/kg	3300		0	0		11	No exceedances of GAC
Phenanthrene	mg/kg	1000		0.3	0.1	0.192333	11	No exceedances of GAC
Anthracene	mg/kg	25000		0.0373	0.0373	0.0373	11	No exceedances of GAC
Fluoranthene	mg/kg	1000		1	0.1	0.394667	11	No exceedances of GAC
Pyrene	mg/kg	2500		0.9	0.2	0.3986	11	No exceedances of GAC
Benzo(a)Anthracene	mg/kg	11		0.5	0.1	0.2276	11	No exceedances of GAC
Chrysene	mg/kg	16		0.5	0.1	0.246	11	No exceedances of GAC
Benzo(b/k)Fluoranthene	mg/kg	12 & 16		1.4	0.1	0.516667	10	No exceedances of GAC
Benzo(b)fluoranthene	mg/kg	12		0.348	0.348	0.348	1	No exceedances of GAC
Benzo(k)fluoranthene	mg/kg	16		0.13	0.13	0.13	1	No exceedances of GAC
Benzo(a)Pyrene	mg/kg	1.6		1	0.1	0.395333	11	No exceedances of GAC
Indeno(123-cd)Pyrene	mg/kg	7		0.8	0.1	0.312833	11	No exceedances of GAC
Dibenzo(ah)Anthracene	mg/kg	1.5		0.3	0.0524	0.1508	11	No exceedances of GAC
Benzo(ghi)Perylene	mg/kg	74		1.3	0.1	0.459571	11	No exceedances of GAC
PAH(total)	mg/kg			8	0.2	2.708571	11	No exceedances of GAC
Organochlorine insecticides								
Aldrin	mg/kg		2	0	0		10	
Chlordane	mg/kg			0	0		10	
DDD	mg/kg			0	0		10	
DDE	mg/kg			0.02	0.02	0.02	10	
DDT	mg/kg			0	0		10	
Dieldrin	mg/kg		3.5	0	0		10	
Endosulphan	mg/kg		44	0	0		10	
Endrin	mg/kg			0	0		10	
Heptachlor	mg/kg			0	0		10	
Heptachlor epoxide	mg/kg			0	0		10	
Hexachlorobenzene	mg/kg			0	0		10	
Hexachlorocyclohexane	mg/kg			0	0		10	

Screened Soil Results (All samples) - Human Health GAC								
			Site Area:					
			Sample Location:					
			Depth:					
			Date Sampled					
			Type:					
Determinand	Units	GAC - Public Open Space 1% SOM	GAC - Residential without Plant Uptake 1% SOM	MAX	MIN	MEAN	No. of samples	COMMENT
Organophosphorous insecticides								
Azinphos methyl	mg/kg			0	0		10	
Diazinon	mg/kg			0	0		10	
Dichlorvos	mg/kg		25	0	0		10	
Dimethoate	mg/kg			0	0		10	
Fenitrothion	mg/kg			0	0		10	
Malathion	mg/kg			0	0		10	
Mevinphos	mg/kg			0	0		10	
Parathion	mg/kg			0	0		10	
Pirimiphos methyl	mg/kg			0	0		10	
Moisture @ 105 C	%			82	4.1	43.34286	21	
Retained on 2mm	%			0	0		21	

**APPENDIX B UNDERGROUND DRAINAGE AND IRRIGATION
INFRASTRUCTURE (BASED ON LANDOWNER
EVIDENCE)**










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NOTES:

KEY

-  SITE BOUNDARY
-  WATERCOURSE
-  UNDERGROUND IRRIGATION MAIN 6" PLASTIC
-  UNDERGROUND IRRIGATION MAIN 6" FIBROUS CEMENT
-  PUMP HOUSE CORRUGATED ASBESTOS ROOF
-  RUBBLE INFILL OVER 10" PLASTIC PERFORATED PIPE (BLOCKED)
-  PLASTIC DRAINAGE PIPE (BLOCKED)

REVISION	DATE	DRAWN	CHECKED	REASONS FOR REVISION/COMMENTS	APPROVED



DOCUMENT:
**ALDHURST FARM
CONTAMINATION ASSESSMENT**

DRAWING TITLE:
**UNDERGROUND DRAINAGE AND
IRRIGATION NETWORK**

DRAWING NO:
FIGURE B1

REVISION:
1.0

DATE:
DEC 2014

DRAWN:
C.L

SCALE:
1:5000@A3

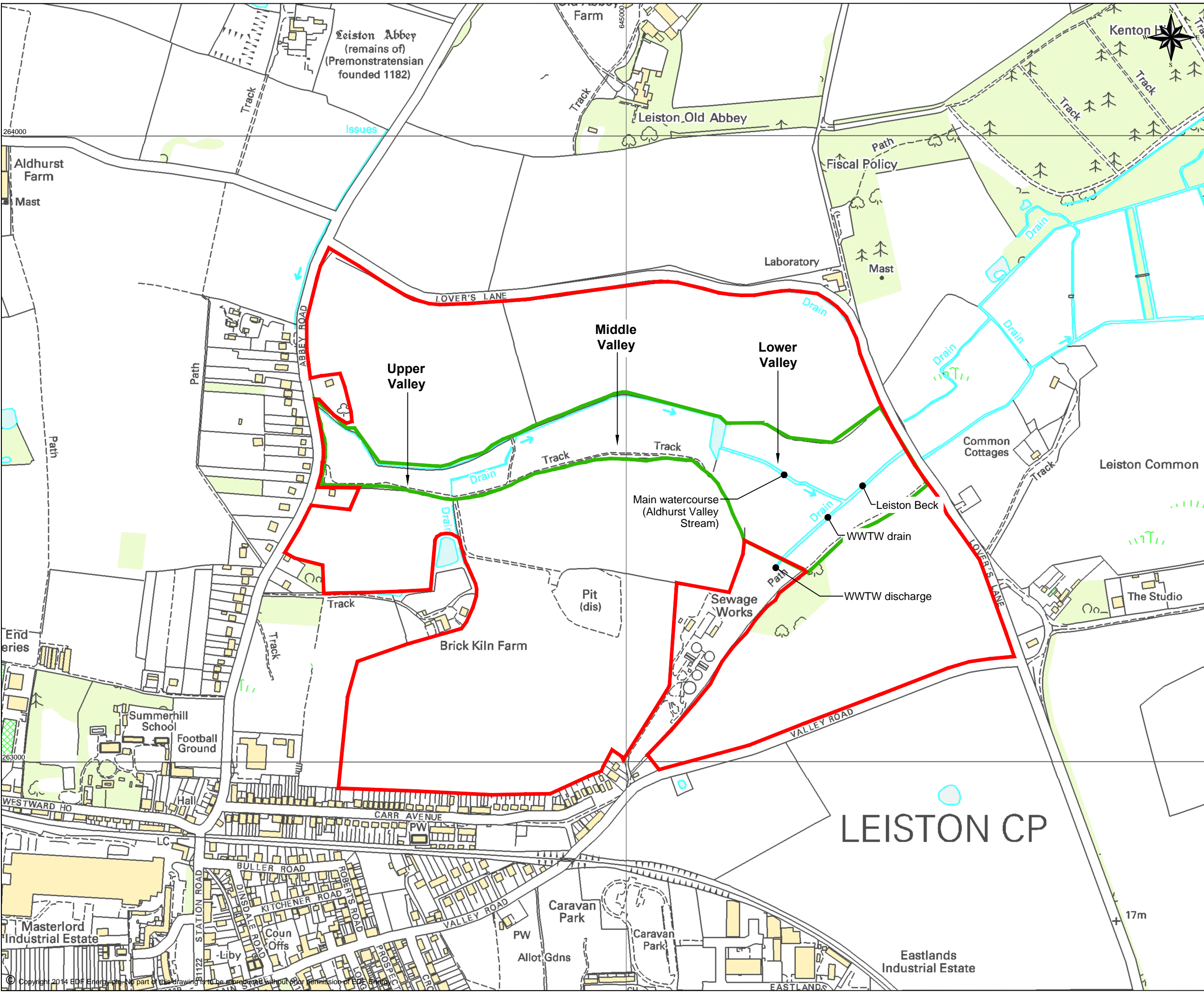
SCALE BAR

DRAWING SECURITY CLASSIFICATION:

PROTECTIVE MARKING REQUIRED

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APPENDIX C COMPILATION OF LARGER SCALE FIGURES





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NOTES:

KEY

	SITE BOUNDARY
	ALDHURST FARM VALLEY

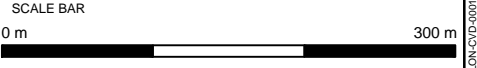
REVISION	DATE	DRAWN	CHECKED	REASONS FOR REVISION/COMMENTS	APPROVED



DOCUMENT:
**ALDHURST FARM SCHEME
 HABITAT CREATION**

DRAWING TITLE:
SITE LOCATION

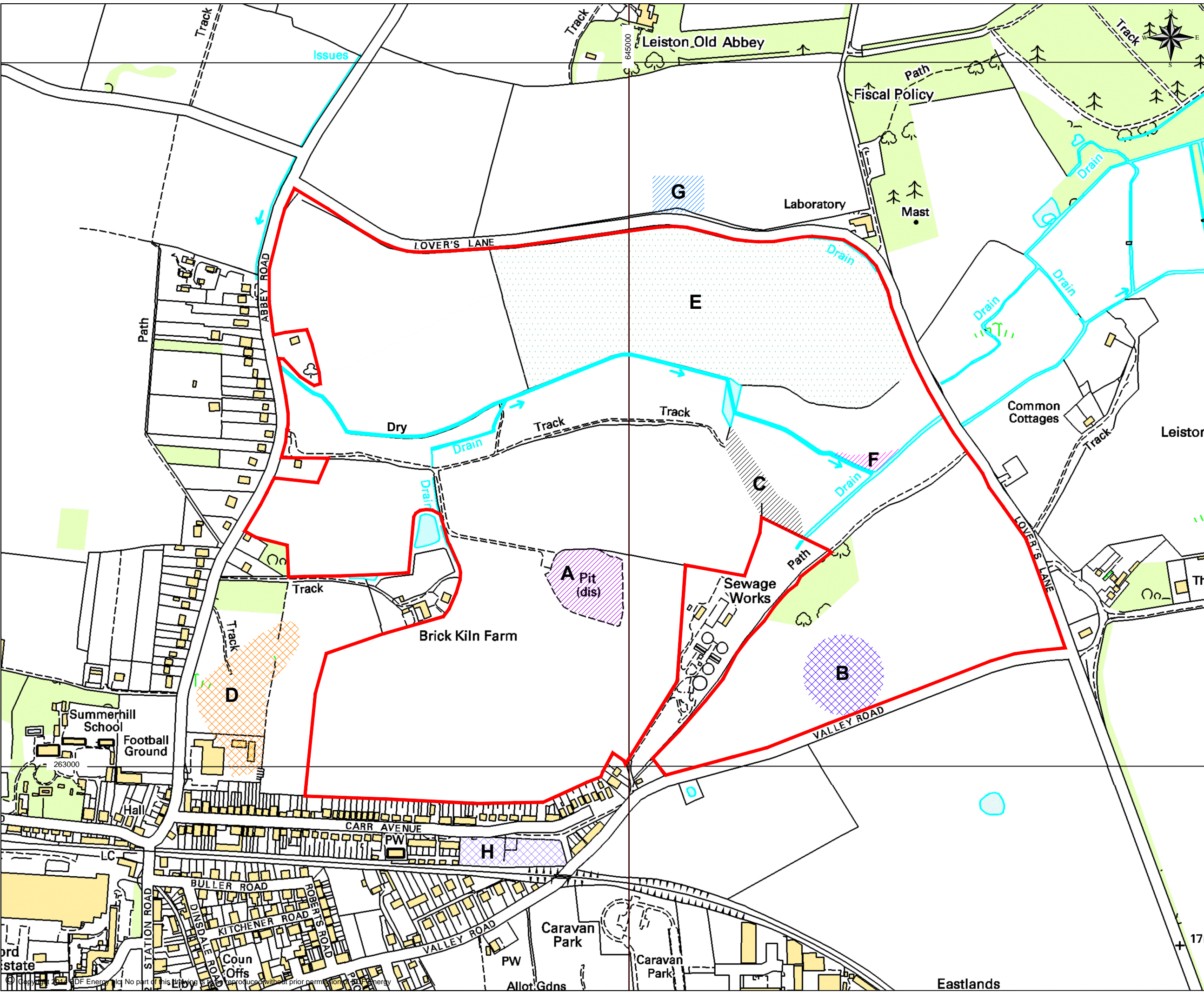
DRAWING NO: FIGURE 1.1	REVISION: 1.0
DATE: DEC 2014	DRAWN: S.H
SCALE: 1:5000@A3	



DRAWING SECURITY CLASSIFICATION:

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NOTES:

KEY

- SITE BOUNDARY
- WATERCOURSE
- A. ALDHURST FARM (HISTORICAL LANDFILL SITE)
- B. 20TH CENTURY INFILL AREA
- C. HISTORICAL LANDFILL SITE (UNRECORDED)
- D. CARR'S PIT - HISTORICAL LANDFILL SITE
- E. MARLED FIELD
- F. POSSIBLE HISTORICAL LANDFILL
- G. ABBEY PIT - HISTORICAL LANDFILL SITE
- H. HISTORICAL GAS WORKS

REVISION	DATE	DRAWN	CHECKED	REASONS FOR REVISION/COMMENTS	APPROVED



DOCUMENT:
CONTAMINATION ASSESSMENT AT ALDHURST FARM

DRAWING TITLE:
AREAS OF POTENTIAL CONTAMINATION

DRAWING NO:
FIGURE 3.1

REVISION:
1.0

DATE:
DEC 2014

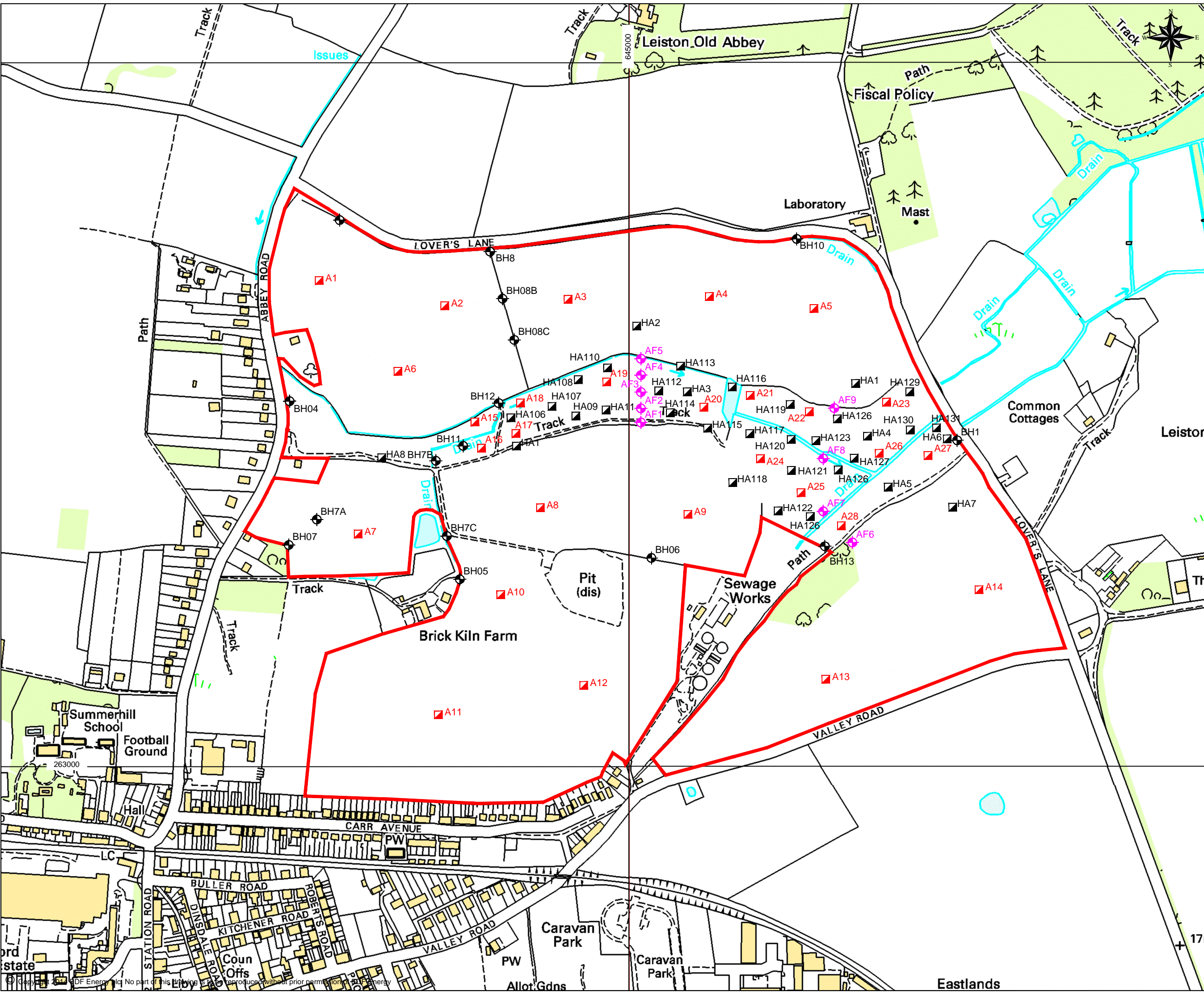
DRAWN:
C.L

SCALE:
1:5000@A3

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DRAWING SECURITY CLASSIFICATION:

- PROTECTIVE MARKING REQUIRED
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NOTES:

KEY

- SITE BOUNDARY
- WATERCOURSE
- BOREHOLES COMPLETED BY ROYAL HASKONING DHV (2010)
- HAND AUGER INVESTIGATION ROYAL HASKONING DHV (2012)
- BOREHOLES COMPLETED BY STRUCTURAL SOILS (2014)
- SUPPLEMENTARY HAND AUGER INVESTIGATION BY AMEC (2014)

REVISION	DATE	DRAWN	CHECKED	REASONS FOR REVISION/COMMENTS	APPROVED



DOCUMENT:
 CONTAMINATION ASSESSMENT
 AT ALDHURST FARM

DRAWING TITLE:
 EXPLORATORY HOLE LOCATIONS

DRAWING NO:
 FIGURE 3.2

REVISION:
 1.0

DATE:
 DEC 2014

DRAWN:
 J.P.

SCALE:
 1:5000@A3

SCALE BAR

DRAWING SECURITY CLASSIFICATION:
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PLANNING PERMISSION

**TOWN AND COUNTRY PLANNING ACT 1990
TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) ORDER
2010**

DC/13/2419/FUL

Agent

Mr David Baker
Stratus Environmental Ltd
4245 Park Approach
Thorpe Park
Leeds
West Yorkshire
LS15 8GB

Applicant

Ms Sarah Rea
National Grid Property Holdings
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

Parish

Leiston

Date Valid

4th September 2013

Proposal: Remediation of former gasworks for the improvement of the site and to reduce potential environmental liabilities (future alternative use to be subject to application planning application in due course)..

Site: Gas Works, Carr Avenue, Leiston

PERMISSION IS HEREBY GRANTED by **SUFFOLK COASTAL DISTRICT COUNCIL** as Local Planning Authority for the purposes of the **TOWN AND COUNTRY PLANNING ACT 1990**, for development in complete accordance with the application shown above, the plan(s) and information contained in the application, and subject to compliance with the following conditions as set out below. Your further attention is drawn to any informatives that may have been included.

In determining the application, the Council has given due weight to all material planning considerations including policies within the development plan as follows:

DM23 Residential Amenity (Suffolk Coastal District Local Plan Core Strategy and Development Management Policies adopted July 2013)

Conditions:

1. The development hereby permitted shall be begun within a period of three years beginning with the date of this permission.

Reason: In accordance with Section 91 of the Town and Country Planning Act 1990 as amended.

2. The development hereby permitted shall not be brought into use until it has been completed in all respects strictly in accordance with details received with the application 19/08/13 and Statement of Community Involvement received 20/11/13 for which permission is hereby granted or which are subsequently submitted to and approved in writing by the Local Planning Authority and in compliance with any conditions imposed by the Local Planning Authority.

Reason: To secure a properly planned development.

3. No occupation of any part of the permitted development / of each phase of development shall take place until a verification report demonstrating completion of works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved, in writing, by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan. The long-term monitoring and maintenance plan shall be implemented as approved.
Reason To ensure protection of the principal aquifer.

4. The remediation measures outlined in the Planning Statement Report No. SS1026/SS of August 2013 shall be carried out in their entirety prior to the site being used for any other purpose. The Council must be informed at least 7 days before the commencement of the remediation works to enable necessary inspections to be arranged.

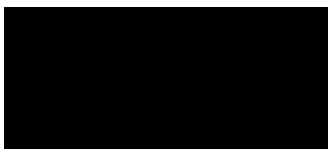
Reason: In the interests of Public Health.

5. Prior to the land being used for any other purpose a validation report stating all measures undertaken to make the site suitable for open storage, shall be submitted to and approved in writing by the local planning authority.

Reason: In the interests of Public Health

Informatives:

There are no informatives.



Head of Planning Services

Date: 9th December 2013

PLEASE READ NOTES BELOW

Note

Most work, including change of use, has to comply with Building Regulations. Have you made an application or given notice before work is commenced?

Note

1. If the applicant is aggrieved by the decision of the Local Planning Authority to refuse permission or consent, or to grant permission or consent subject to conditions, he may appeal to the First Secretary of State. The applicant's right to appeal is in accordance with the appropriate statutory provisions which follow:

Planning applications: Sections 78 and 79 Town & Country Planning Act 1990

Listed Building applications: Section 20, 21 and 22 Planning (Listed Buildings and Conservation Areas) Act 1990.

Advertisement applications: Section 220 and 221, Town and Country Planning Act 1990 Regulation 15 Town & Country Planning (Control of Advertisements) Regulations 1989.

2. **Notice of appeal** in the case of applications for advertisement consent must be served within **two months** of the date of this notice. Householder planning applications must be served within **twelve weeks** of the date of this notice. In all other cases, notice of appeal must be served within **six months** of the date of this notice. Appeals must be made on a form which is obtainable from The Planning Inspectorate, Registry/Scanning Room, 3/05 Kite Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN; or online at <http://www.planningportal.gov.uk/planning/appeals/>. The Planning Inspectorate website can be viewed at <http://www.planning-inspectorate.gov.uk/>.

3. The First Secretary of State has power to allow a longer period for the giving of notice of appeal but he will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice of appeal. The First Secretary of State is not required to entertain an appeal if it appears to him that permission for the proposed development could not have been granted by the Local Planning Authority, or could not have been so granted otherwise than subject to the conditions imposed by them, having regard to the statutory requirements, to the provisions of the Development Order, and to any directions given under the Order. He does not in practice refuse to entertain appeals solely because the decision of the Local Planning Authority was based on a direction given by him.

4. If permission or consent to develop land or carry out works is refused or granted subject to conditions, whether by the Local Planning Authority or by the First Secretary of State, and the owner of the land claims that the land has become incapable of reasonably beneficial use by the carrying out of any development or works which has been or would be permitted, he may serve on the Council of the district in which the land is situated a purchase notice requiring the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

5. In certain circumstances, a claim may be made against the Local Planning Authority for compensation where permission is refused or granted subject to conditions by the First Secretary of State on appeal or on a reference of the application to him. The circumstances in which such compensation is payable are set out in Sections 114 and 116 of the Town and Country Planning Act 1990.

Appendix F. Definitions of Probability & Consequences

Definitions of Probability and Consequence

Table F.1 - Risk estimation - classification of probability

Classification	Definition of the probability of harm / pollution occurring
High Likelihood	The contaminant linkage exists and it is very likely to result in harm / pollution in the short term, and/or will almost inevitably result in harm / pollution in the long term, and/or there is current evidence of harm/pollution. Likelihood is defined as more likely than not and meets the definition of 'significant possibility' within Part 2A Contaminated Land Statutory Guidance.
Likely	The source, pathway and receptor exist for the contaminant linkage and it is probable that harm / pollution will occur. Circumstances are such that harm / pollution is not inevitable, but possible in the short term and likely over the long term. Likelihood is defined as reasonably possible and meets the definition of 'significant possibility' within Part 2A Contaminated Land Statutory Guidance.
Low Likelihood	The source, pathway and receptor exist and it is possible that harm / pollution could occur. Circumstances are such that harm/pollution is by no means certain in the long term and less likely in the short term.
Unlikely	The source, pathway and receptor exist for the contaminant linkage but it is improbable that harm / pollution will occur even in the long term.

Table F.2 - Risk estimation - classification of consequence

Classification	Definition of consequence
Human Health Receptors – Site end user or other sensitive receptor	
Severe	Acute damage to human health based on the effects on the critical human receptor. Concentrations of contaminants above appropriate site specific assessment criteria. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Medium	Chronic damage to human health based on the effects on the critical human receptor. Concentrations of contaminants above appropriate site specific assessment criteria. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Mild	No appreciable impact on human health based on the potential effects on the critical human receptor. Concentrations of contaminants above generic assessment criteria but below appropriate site specific assessment criteria.
Minor	No appreciable impact on human health based on the effects on the critical human receptor. Concentrations of contaminants below appropriate generic assessment criteria.
Human Health Receptors – Site construction workers	
Severe	Exposure to hazardous substances resulting in a reportable death, major injury, 3-day injury or illness/disease under RIDDOR.
Medium	Exposure to hazardous substances resulting in a dangerous occurrence reportable under RIDDOR. Exposure to hazardous substances resulting in exceedance of a workplace exposure limit.
Mild	Exposure to hazardous substances resulting in limited effects such as headache, dizziness, nausea. Exposures below the workplace exposure limits. Not reportable under RIDDOR.
Minor	Minor exposure to hazardous substance resulting in no appreciable ill health effects.

Controlled Water Receptors

Severe	Pollution of a Principal Aquifer within a source protection zone or potable supply characterised by a breach of drinking water standards. Pollution of a surface water course characterised by a breach of an Environmental Quality Standard (EQS) at a statutory monitoring location or resulting in a change in General Quality Assessment (GQA) grade of river reach. Discharge of a List I or List II substance to groundwater. Pollution meets Part 2A Contaminated Land Statutory Guidance definition.
Medium	Pollution of a Principal Aquifer outside a source protection zone or a Secondary A Aquifer characterised by a breach of drinking water standards. Pollution of an industrial groundwater abstraction or irrigation supply that impairs its function. Substantial pollution but insufficient to result in a change in the GQA grade of river reach Pollution meets Part 2A Contaminated Land Statutory Guidance definition.
Mild	Low levels of pollution of a Principal Aquifer outside a source protection zone or an industrial abstraction, or pollution of a Secondary Aquifer. Low levels of pollution insufficient to result in a change in the GQA grade of river reach, pollution of a surface water course without a quality classification.
Minor	No appreciable pollution, or pollution of a low sensitivity receptor such as a non-aquifer or a surface water course without a quality classification

Property Receptors – Buildings, Foundations and Services

Severe	Catastrophic damage to buildings, such as explosion. Catastrophic failure of foundations and services. Substantial damage to a Scheduled Monument significantly impairing the by reason of which the monument is scheduled. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Medium	Substantial damage to buildings and foundations rendering the structures unsafe. Substantial damage to services impairing their function. Significant damage to a Scheduled Monument significantly impairing the reason of which the monument is scheduled. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Mild	Significant damage to buildings and foundations but not resulting in them being unsafe for occupation. Damage to services but not sufficient to impair their function. Damage to a Scheduled Monument but no significant impairment to the reason of which the monument is scheduled.
Minor	Easily repairable damage to buildings, foundations and services.

Property Receptors – Crops and Livestock and Ecological Receptors

Severe	Substantial loss in the value of crops or domestically-grown produce. Death to livestock, domesticated animals or wild animals subject to shooting or fishing rights. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Medium	Substantial diminution in yield (over 20% reduction) of crops or domestically-grown produce. Serious disease or other serious physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights. Harm meets definition of 'significant harm' within Part 2A Contaminated Land Statutory Guidance.
Mild	Harm to crops but not resulting in a substantial loss in value or diminution in yield (less than 20% reduction). Limited harm in terms of disease or other physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights.

Appendix G. Site Visit Photographs

Date: 20/03/19	Project: Sizewell C Site Walkover, Green Rail Route
Comments	
View of the north of the site from Abbey Lane, looking south towards Buckleswood Road.	

Date: 20/03/19	Project: Sizewell C Site Walkover, Green Rail Route
Comments	
View of the south of the site, looking north from Buckleswood Road.	

Atkins Limited
The Axis
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1. Conceptual Site Models

Table 1.1: Rail extension route construction phase conceptual site model.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates.</p> <p>Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, Polychlorinated Biphenyls (PCBs), asbestos, etc.</p>	Human health: On-site.	Farmers/workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water. Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapours.	Low likelihood.	Mild	Low risk.	Receptor not present.			Further intrusive ground investigation undertaken post planning to inform the detailed design and confirm the ground conditions and contamination status of the site including soil and groundwater sampling and monitoring. Remediation of soil and groundwater contamination prior to construction (e.g. source removal, treatment or capping) if deemed necessary.	Receptor not present.		
		Construction/maintenance workers.		Receptor not present.			Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
		Commuters/pedestrians/cyclists/horse riders accessing roads and public rights of way crossing the new railway line.		Low likelihood.	Mild	Low risk.	Receptor not present.				Receptor not present.		
		Users of the new railway line.		Receptor not present.			Receptor not present.				Receptor not present.		
	Human health: Off-site	Farmers/workers on adjacent agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site. Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapour which may have migrated off-site.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
		Commuters/pedestrians/cyclists/horse riders accessing surrounding roads.		Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
		Residents in adjacent properties.		Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
	Controlled Waters.	Principal bedrock aquifer and Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers. Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Mild	Very low risk.
				Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Mild	Very low risk.

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
		Drains / watercourses / ponds within the study area.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
	Property services / Existing on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.	Unlikely		Minor	Very low risk.	
		Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.	Unlikely		Minor	Very low risk.	
	Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely		Minor	Very low risk.	
		Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Receptor not present.			Receptor not present.				Receptor not present.		

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
		Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Low likelihood.	Mild	Low risk.	Receptor not present.				Receptor not present.		
		Crops and livestock (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Low likelihood.	Mild	Low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/inhalation/dermal contact by fauna.	Low likelihood.	Mild	Low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
Off-site: Made Ground associated with the construction and operation of the adjacent railway line and roads. Made Ground / fill material associated with the former pits and brick works located within 500 metres (m) of the site. Historical landfills located within 500m of the site. Airfield (RAF Leiston) located 500m north-west of the site.	Human health: On-site	Farmers/workers on agricultural land.	Dermal contact with and/or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site. Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
		Construction / maintenance workers.		Receptor not present.			Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
		Users of the new railway line.		Receptor not present.			Receptor not present.				Receptor not present.		

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
<p>Potential spreading of sediment including sanitary waste from pumping station and Leiston Wastewater Treatment Works onto fields adjacent to the site. Farmland surrounding the site. Potential for unmapped farmers tips. Potential contamination may comprise metals, inorganic contaminants, fuels and oils, PCBs, hydrocarbons, treatment chemicals, herbicides, pesticides, silage, effluent, asbestos and a potential for hazard gas generation.</p>	Controlled Waters.	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Medium	Low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Medium	Low risk.
	Property / services on-site and structures.	Existing on-site and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Minor	Very low risk.	Low likelihood.	Minor	Very low risk.		Unlikely	Minor	Very low risk.
		Future on-site and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
	Crops and livestock (on-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.				

Table 1.2: Rail extension route operation phase conceptual site model.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Residual Risk Category.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates. Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons,</p>	Human health: On-site.	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low likelihood	Mild	Low risk.	Receptor not present.			Receptor not present.		
		Construction / maintenance workers.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapours.	Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Low likelihood.	Mild	Low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Users of the new railway line.		Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
	Human health: Off-site.	Farmers / workers on adjacent agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Pedestrians / cyclists / horse riders accessing surrounding roads.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapour which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Residents in adjacent properties.		Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
	Controlled Waters.	Principal Bedrock aquifer and Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Residual Risk Category.
PCBs, asbestos, etc.		Drains / watercourses /ponds within the study area.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Receptor not present.			Unlikely	Minor	Very low risk.	Unlikely	Minor
		Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Low likelihood.	Mild	Low risk.	Receptor not present.			Receptor not present.		
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Residual Risk Category.
		Crops and livestock (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Low likelihood.	Mild	Low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/inhalation/dermal contact by fauna.	Low likelihood.	Mild	Low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
Off-site: Made Ground from construction and operation of the adjacent railway line and roads. Made Ground/fill associated with the former pits, brick works and historical landfills located within study area. Airfield (RAF Leiston) located 500m north-west of the site. Potential spreading of sediment including sanitary waste from pumping station and Leiston Wastewater Treatment	Human health: On-site.	Farmers/workers on agricultural land.	Dermal contact with and/or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site. Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.	--	--
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Construction / maintenance workers.		Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Users of the new railway line.		Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
	Controlled Waters.	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Residual Risk Category.
<p>Works onto adjacent fields. Farmland and potential for unmapped farmers tips in study area.</p> <p>Potential contamination may comprise metals, inorganic contaminants, fuels/oils, PCBs, hydrocarbons, treatment chemicals, herbicides, pesticides, silage, effluent, asbestos and a potential for hazard gas generation.</p>	Property/ services	Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Minor	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Crops and livestock (on-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.	

Table 1.3: Rail extension route removal and reinstatement phase conceptual site model.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Removal and Reinstatement with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Removal and Reinstatement with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates.</p> <p>Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site.	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low likelihood.	Mild	Low risk.	Receptor not present.			<p>Intrusive ground investigation undertaken post operation including soil and groundwater sampling and monitoring. Remediation of soil and groundwater contamination prior to construction (e.g. source removal, treatment or capping) if deemed necessary.</p>	Receptor not present.		
		Construction/maintenance workers.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapours.	Receptor not present.			Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the new railway line.		Low likelihood.	Mild	Low risk.	Receptor not present.				Receptor not present.		
		Users of the new railway line.		Receptor not present.			Receptor not present.				Receptor not present.		
	Human health: Off-site.	Farmers / workers on adjacent agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
		Pedestrians / cyclists / horse riders accessing surrounding roads.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapour which may have migrated off-site.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
		Residents in adjacent properties.		Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
	Controlled Waters.	Principal Bedrock aquifer and Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Mild	Very low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Mild	Very low risk.
		Drains / watercourses / ponds within the study area.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Removal and Reinstatement with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Removal and Reinstatement with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
Property services /	Existing on-site services and structures.		Direct contact of contaminants in soil and/or groundwater with buried services.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
	Existing off-site structures and services (including archaeological features and Grade II listed buildings).		Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Minor	Very low risk.
			Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Receptor not present.			Receptor not present.				Receptor not present.	
	Future on-site services and structures.		Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
			Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Low likelihood.	Mild	Low risk.	Receptor not present.				Receptor not present.	
	Crops and livestock (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Low likelihood.	Mild	Low risk.	Low likelihood.	Mild	Low risk.	Unlikely		Mild	Very low risk.	

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Removal and Reinstatement with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Removal and Reinstatement with Primary, Tertiary and Secondary Mitigation.			
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.	
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/inhalation/dermal contact by fauna.	Low likelihood.	Mild	Low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.	
Off-site: Made Ground associated with the construction and operation of the adjacent railway line and roads. Made Ground / fill material associated with the former pits and brick works located within 500m of the site. Historical landfills located within 500m of the site. Airfield (RAF Leiston) located 500m north-west of the site. Potential spreading of sediment including sanitary waste from pumping station and Leiston Wastewater Treatment Works onto fields adjacent to the site. Farmland surrounding the site. Potential for unmapped farmers tips. Potential contamination may comprise metals, inorganic contaminants, fuels and oils, PCBs, hydrocarbons, treatment chemicals,	Human health: On-site.	Farmers/workers on agricultural land.	Dermal contact with and/or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site. Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.			
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.				
		Construction / maintenance workers.		Receptor not present.			Low likelihood.	Mild	Low risk.			Unlikely	Mild	Very low risk.
		Users of the new railway line.		Receptor not present.			Receptor not present.					Receptor not present.		
	Controlled waters.	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Medium	Low risk.	
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Low likelihood.	Medium	Moderate/low risk.		Unlikely	Medium	Low risk.	
	Property / services	Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Minor	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.	

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Removal and Reinstatement with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Removal and Reinstatement with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
herbicides, pesticides, silage, effluent, asbestos and a potential for hazard gas generation.		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
		Crops and livestock (on-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		

Table 1.4: Rail improvement works construction phase conceptual site model.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line.</p> <p>A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates.</p> <p>Farmland within site boundary. Potential for un-mapped farmers tips.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site.	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Mild	Very low risk.	Receptor not present.			Site walkover survey to identify areas of potential contamination risk, surface sampling of these areas to ascertain risks.	Receptor not present.		
		Construction / maintenance workers.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapours.	Unlikely	Mild	Very low risk.	Low likelihood.	Mild	Low risk.		Unlikely	Mild	Very low risk.
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Receptor not present.			Watching brief during construction works where contamination is suspected.	Receptor not present.		
		Users of the existing Saxmundham-Leiston branch line.		Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
	Human health: Off-site.	Farmers / workers on adjacent agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
		Pedestrians / cyclists / horse riders accessing surrounding roads.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapour which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
		Residents in adjacent properties and users of commercial properties in the surrounding area.		Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
	Controlled Waters.	Principal Bedrock aquifer and Secondary A and Secondary	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.		Unlikely	Medium	Low risk.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
		Undifferentiated Superficial aquifer.	Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.		Unlikely	Medium	Low risk.
		The River Fromus and Hundred River and ponds and drains within 50m of the site.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Minor	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Minor	Very low risk.
	Property services /	Existing on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Minor	Very low risk.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Minor	Very low risk.
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
			Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Receptor not present.			Receptor not present.				Receptor not present.	

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
		Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
		Crops and livestock (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Mild	Very low risk.
Off-site: Ground associated with the construction and operation of the adjacent railway line and roads. Made Ground / fill material associated with the former pits and brick works located within 50m of the site. Farmland surrounding the site. Potential for unmapped farmers tips. Former rifle ranges located adjacent to the site at Saxmundham. Tanks, works, coal yard, gas distribution station with tanks / gasholders, depot and electricity substation located adjacent to the	Human health: On-site.	Farmers/workers on agricultural land.	Dermal contact with and/or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site. Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		
		Construction / maintenance workers.		Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Mild	Very low risk.
	Users of the existing Saxmundham-Leiston branch line.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.				
	Controlled waters.	Principal Bedrock aquifer, Secondary A and Secondary	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.		Unlikely	Medium	Low risk.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Construction with Primary and Tertiary Mitigation.			Secondary Mitigation Measures.	Construction with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.		Probability	Consequence	Residual Risk Category.
<p>north of the site in Leiston.</p> <p>Leiston Works located 50m to the south of the site.</p> <p>Windmills located 50m south of the site in Leiston.</p> <p>Allotments located 50m south-west of the site around Leiston and Sizewell crossing.</p> <p>Eastlands Industrial Estate located adjacent to the south-east of the site.</p> <p>Abbey Road service station located 50m to the north of the site in Leiston and coach and bus station located 10m to the south-west of the site in Saxmundham.</p> <p>Leiston Press, a tyre dealer and pest and vermin control company located 50m to the south of the site in Leiston.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>		Undifferentiated Superficial aquifer.	Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.		Unlikely	Medium	Low risk.
		The River Fromus and Hundred River.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.		Unlikely	Minor	Very low risk.
	Property / services	Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.		Unlikely	Mild	Very low risk.
		Future on-site services and structures (including archaeological features and listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Receptor not present.				Receptor not present.		
		Crops and livestock (on-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Receptor not present.				Receptor not present.		

Table 1.5: Rail improvement works operation phase conceptual site model.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates. Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site.	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.		
		Construction / maintenance workers.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapours.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Users of the existing Saxmundham-Leiston branch line.		Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
	Human health: Off-site.	Farmers / workers on adjacent agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Pedestrians / cyclists / horse riders accessing surrounding roads.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas and/or vapour which may have migrated off-site.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Residents in adjacent properties and users of commercial properties in the surrounding area.		Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
	Controlled Waters.	Principal Bedrock aquifer and Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.
		The River Fromus and Hundred River and ponds and drains within 50m of the site.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.

NOT PROTECTIVELY MARKED

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with buried services.	Receptor not present.			Unlikely	Minor	Very low risk.	Unlikely	Minor
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.	
		Crops and livestock (off-site).	Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
Off-site: Made Ground associated with the construction and operation of the adjacent railway line and roads. Made Ground / fill material associated with the former pits and brick works located within 50m of the site. Farmland surrounding the site. Potential for unmapped farmers tips.	Human health: On-site.	Farmers/workers on agricultural land.	Dermal contact with and/or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.		
			Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
			Construction / maintenance workers.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.

Source	Receptor		Contaminant Exposure / Migration Pathway.	Baseline			Operation with Primary and Tertiary Mitigation (Assumed All Mitigation Proposed During Construction is Undertaken).			Operation with Primary, Tertiary and Secondary Mitigation.		
				Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.	Probability	Consequence	Risk Category.
<p>Former rifle ranges located adjacent to the site at Saxmundham.</p> <p>Tanks, works, coal yard, gas distribution station with tanks / gasholders, depot and electricity substation located adjacent to the north of the site in Leiston.</p> <p>Leiston Works located 50m to the south of the site.</p> <p>Windmills located 50m south of the site in Leiston.</p> <p>Allotments located 50m south-west of the site around Leiston and Sizewell crossing.</p> <p>Eastlands Industrial Estate located adjacent to the south-east of the site.</p> <p>Abbey Road service station located 50m to the north of the site in Leiston and coach and bus station located 10m to the south-west of the site in Saxmundham.</p> <p>Leiston Press, a tyre dealer and pest and vermin control company located 50m to the south of the site in Leiston.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Controlled Waters.	Users of the existing Saxmundham-Leiston branch line.		Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
		Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.	Unlikely	Medium	Low risk.
		The River Fromus and Hundred River.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
			Discharge of contaminants entrained in groundwater and/or surface water run-off followed by overland flow and discharge.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.	Unlikely	Minor	Very low risk.
		Property/ services	Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.	Unlikely	Mild
	Future on-site services and structures.		Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.			Unlikely	Mild	Very low risk.	Unlikely	Mild	Very low risk.
	Crops and livestock (on-site).		Migration of contaminated waters/dust/fibres and subsequent uptake by crops or ingestion/inhalation/dermal contact by livestock.	Unlikely	Mild	Very low risk.	Receptor not present.			Receptor not present.		



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Plates

None provided.

Figures

None provided.

1. Impact Assessment Tables

Table 1.1: Rail extension route construction phase impact assessment.

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.	
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates. Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, Polychlorinated Biphenyls (PCBs), asbestos, etc.</p>	Human health: On-site.	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low risk.	Receptor not present.	Further intrusive ground investigation undertaken post planning to inform the detailed design and confirm the ground conditions and contamination status of the site including soil and groundwater sampling and monitoring. Remediation of soil and groundwater contamination prior to construction (e.g. source removal, treatment or capping) if deemed necessary.	Receptor not present.	Negligible ¹	
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas/vapours.	Low risk.	Receptor not present.		NegligibleError! Bookmark not defined. ¹	Receptor not present.	Negligible ¹
		Construction / maintenance workers.		Receptor not present.	Low risk.		Minor adverse.	Very low risk.	Negligible ²
		Users of the new railway line.		Receptor not present.	Receptor not present.		Negligible	Receptor not present.	Negligible
	Human health: Off-site.	Farmers / workers on adjoining agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Very low risk.	Low risk.		Minor adverse.	Very low risk.	Negligible
		Pedestrians / cyclists / horse riders accessing roads and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapour which may have migrated off-site.	Very low risk.	Low risk.		Minor adverse.	Very low risk.	Negligible
		Residents in adjacent properties.		Very low risk.	Low risk.		Minor adverse.	Very low risk.	Negligible
	Controlled Waters.	Principal Bedrock and Secondary A / undifferentiated Superficial aquifers.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.		Minor adverse.	Very low risk.	Minor beneficial.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.		Minor adverse.	Very low risk.	Minor beneficial.
		Drains / watercourses / ponds within 100 metres (m) of the site.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Very low risk.	Low risk.		Minor adverse.	Very low risk.	Negligible
			Discharge of contaminants entrained in groundwater and / or surface water	Very low risk	Low risk		Minor adverse	Very low risk	Negligible

¹ Removal of this receptor at construction automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

² Introduction of this receptor at construction automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.		
			run-off followed by overland flow and discharge.							
	Property / services.	Existing on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Very low risk	Low risk	Minor adverse		Very low risk	Negligible	
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Low risk	Minor adverse		Very low risk	Negligible	
	Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible	Very low risk		Negligible		
			Future on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Receptor not present	Receptor not present		Negligible	Receptor not present	Negligible
	Future on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present	Receptor not present	Negligible	Receptor not present		Negligible		
			Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and / or livestock.	Low risk	Receptor not present		Negligible ¹	Receptor not present	Negligible ¹
	Crops and livestock (off-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Low risk.	Low risk.	Negligible	Very low risk.		Minor beneficial.		
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site.	Migration of contaminated waters / dust / fibres and subsequent uptake by flora or ingestion / inhalation / dermal contact by fauna.	Low risk.	Low risk.	Negligible		Very low risk.	Minor beneficial.	
	Off-site: Made Ground associated with the construction and	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site.	Very low risk.	Receptor not present.		Negligible ¹	Receptor not present.	Negligible ¹
			Commuters / pedestrians / cyclists / horse riders accessing	Very low risk.	Receptor not present.	Negligible ¹		Receptor not present.	Negligible ¹	

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
<p>operation of the adjacent railway line and roads.</p> <p>Made Ground / fill material associated with the former pits and brick works located within 500m of the site.</p> <p>Historical landfills located within 500m of the site.</p> <p>Airfield (RAF Leiston) located 500m north-west of the site.</p> <p>Potential spreading of sediment including sanitary waste from Pumping station and Leiston Wastewater Treatment Works onto fields adjacent to the site.</p> <p>Farmland surrounding the site. Potential for unmapped farmers tips.</p> <p>Potential contamination may comprise metals, inorganic contaminants, fuels and oils, PCBs, hydrocarbons, treatment chemicals, herbicides, pesticides, silage, effluent, asbestos and a potential for hazard gas generation.</p>		roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.						
		Construction / maintenance workers.		Receptor not present.	Low risk.	Minor adverse.	Very low risk.	Negligible ²	
		Users of the new railway line.		Receptor not present.	Receptor not present.	Negligible	Receptor not present.	Negligible	
	Controlled waters	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.	Minor adverse.	Low risk.	Negligible	
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.	Minor adverse.	Low risk.	Negligible	
	Property / services	Existing on-site services.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Low risk.	Minor adverse.	Very low risk.	Negligible	
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Receptor not present.	Negligible	Receptor not present.	Negligible	
		Crops and livestock (on-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Receptor not present.	Negligible ¹	Receptor not present.	Negligible ¹	

Table 1.2: Rail extension route operational phase impact assessment.

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment (with primary, tertiary and secondary mitigation).	Residual Effects.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates. Farmland within site boundary. Potential for unmapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low risk.	Receptor not present.	Negligible ³	Receptor not present.	Negligible ³
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapours.	Low risk.	Very low risk.	Minor beneficial.	Very low risk.	Minor beneficial.
		Construction / maintenance workers.		Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
		Users of the new railway line.		Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
	Human health: Off-site	Farmers / workers on adjoining agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Pedestrians / cyclists / horse riders accessing roads and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapour which may have migrated off-site.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Residents in adjacent properties.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Controlled Waters	Principal Bedrock and Secondary A / undifferentiated Superficial aquifers.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Very low risk.	Minor beneficial.	Very low risk.	Minor beneficial.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Very low risk.	Minor beneficial.	Very low risk.	Minor beneficial.
		Drains / watercourses / ponds within 100m of the site.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible

³ Removal of this receptor at operation automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

⁴ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment (with primary, tertiary and secondary mitigation).	Residual Effects.
			Discharge of contaminants entrained in groundwater and / or surface water run-off followed by overland flow and discharge.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Future on-site services and structures.		Direct contact of contaminants in soil and / or groundwater with buried services.	Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
	Crops and livestock (on-site).		Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and / or livestock.	Low risk.	Receptor not present.	Negligible ³	Receptor not present.	Negligible ³
	Crops and livestock (off-site).		Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Low risk.	Very low risk.	Minor beneficial.	Very low risk.	Minor beneficial.

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment (with primary, tertiary and secondary mitigation).	Residual Effects.	
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site.	Migration of contaminated waters / dust / fibres and subsequent uptake by flora or ingestion / inhalation / dermal contact by fauna.	Low risk.	Very low risk.	Minor beneficial.	Very low risk.	Minor beneficial.
<p>Off-site:</p> <p>Made Ground associated with the construction and operation of the adjacent railway line and roads.</p> <p>Made Ground / fill material associated with the former pits, brick works and historical landfills located within study area.</p> <p>Airfield (RAF Leiston) located 500m north-west of the site.</p> <p>Potential contaminants may include metals, inorganic and organic contaminants, fuels, oils, asbestos and a potential for vapour and / or ground gas generation.</p> <p>Potential spreading of sediment including sanitary waste from Pumping station and Leiston Wastewater Treatment Works onto fields adjacent to the site.</p> <p>Potential contamination may comprise metals, inorganic contaminants, fuels and oils, PCBs, treatment chemicals, and a potential for hazard gas generation.</p> <p>Farmland and potentially unmapped farmers tips.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site	Farmers / workers on agricultural land	<p>Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site.</p> <p>Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.</p>	Very low risk.	Receptor not present.	Negligible ³	Receptor not present.	Negligible ³
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Construction / maintenance workers.		Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
		Users of the new railway line.		Receptor not present.	Very low risk.	Negligible ⁴	Very low risk.	Negligible ⁴
	Controlled waters	Principal Bedrock aquifer and Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
	Property / services	Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Very low risk.	Negligible ⁴	Very low risk	Negligible ⁴
		Crops and livestock (on-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Receptor not present.	Negligible ³	Receptor not present.	Negligible ³

Table 1.3: Rail extension route removal and reinstatement phase impact assessment.

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Removal and Reinstatement Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary Mitigation.	Removal and Reinstatement Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates.</p> <p>Farmland within site boundary. Potential for unmapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low risk	Receptor not present.	Negligible ³	Intrusive ground investigation undertaken post operation including soil and groundwater sampling and monitoring. Remediation of soil and groundwater contamination (e.g. source removal, treatment or capping) if deemed necessary.	Receptor not present.	Negligible ³
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapours.	Low risk	Receptor not present.	Negligible ³		Receptor not present.	Negligible ³
		Construction / maintenance workers.		Receptor not present.	Low risk.	Minor adverse.		Very low risk.	Negligible ²
		Users of the new railway line.		Receptor not present.	Receptor not present.	Negligible		Receptor not present.	Negligible
	Human health: Off-site	Farmers / workers on adjoining agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
		Pedestrians / cyclists / horse riders accessing roads and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapour which may have migrated off-site.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
		Residents in adjacent properties.		Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
	Controlled Waters	Principal Bedrock and Secondary A / Undifferentiated Superficial aquifers.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.	Minor adverse.		Very low risk.	Minor beneficial.
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.	Minor adverse.		Very low risk.	Minor beneficial.
		Drains / watercourses / ponds within 100m of the site.	Lateral migration of contaminated groundwater with discharge to surface	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible.

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Removal and Reinstatement Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary Mitigation.	Removal and Reinstatement Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
			watercourses as base flow.						
			Discharge of contaminants entrained in groundwater and / or surface water run-off followed by overland flow and discharge.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried service.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Low risk.	Minor adverse.		Very low risk.	Negligible
			Future on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Receptor not present.	Receptor not present.		Negligible.	Receptor not present.
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Receptor not present.	Negligible.		Receptor not present.	Negligible
			Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water	Low risk.	Receptor not present.		Negligible ³	Receptor not present.

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Removal and Reinstatement Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary Mitigation.	Removal and Reinstatement Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
			contamination by crops and / or livestock.						
		Crops and livestock (off-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Low risk.	Low risk.	Negligible		Very low risk.	Minor beneficial.
	Ecological	Buckle's Wood Ancient Woodland and Country Wildlife Site.	Migration of contaminated waters / dust / fibres and subsequent uptake by flora or ingestion / inhalation / dermal contact by fauna.	Low risk.	Low risk.	Negligible		Very low risk.	Minor beneficial.
<p>Off-site:</p> <p>Made Ground associated with the construction and operation of the adjacent railway line and roads.</p> <p>Made Ground / fill material associated with the former pits and brick works located within 500m of the site.</p> <p>Historical landfills located within 500m of the site.</p> <p>Airfield (RAF Leiston) located 500m north-west of the site.</p> <p>Potential contaminants may include metals, inorganic and organic contaminants, fuels, oils, asbestos and a potential for vapour and / or ground gas generation.</p> <p>Potential spreading of sediment including sanitary</p>	Human health: On-site	Farmers / workers on agricultural land.	<p>Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site.</p> <p>Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.</p>	Very low risk.	Receptor not present.	Negligible ³		Receptor not present.	Negligible ³
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.		Very low risk.	Receptor not present.	Negligible ³		Receptor not present.	Negligible ³
		Construction / maintenance workers.		Receptor not present.	Low risk.	Minor adverse.		Very low risk.	Negligible ⁵
		Users of the new railway line.		Receptor not present.	Receptor not present.	Negligible		Receptor not present.	Negligible
	Controlled Waters	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Moderate / low risk.	Minor adverse.		Low risk.	Negligible
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular	Low risk.	Moderate / low risk.	Minor adverse.		Low risk.	Negligible

⁵ Introduction of this receptor at construction automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Removal and Reinstatement Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary Mitigation.	Removal and Reinstatement Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
<p>waste from Pumping station and Leiston Wastewater Treatment Works onto fields adjacent to the site.</p> <p>Potential contamination may comprise metals, inorganic contaminants, fuels and oils, PCBs, treatment chemicals, and a potential for hazard gas generation.</p> <p>Farmland surrounding the site. Potential for unmapped farmers tips.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils.</p> <p>Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Property / services.		material to groundwater in underlying aquifers.						
		Existing on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Low risk.	Minor adverse.	Very low risk.	Negligible	
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Receptor not present.	Negligible	Receptor not present.	Negligible	
		Crops and livestock (on-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Receptor not present.	Negligible ³	Receptor not present.	Negligible ³	

Table 1.4: Rail improvement works construction phase impact assessment.

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.	
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line. A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates. Farmland within site boundary. Potential for un-mapped farmers tips. Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Very low risk.	Receptor not present.	Site walkover survey to identify areas of potential contamination risk, surface sampling of these areas to ascertain risks. Watching brief during construction works where contamination is suspected.	Receptor not present.	Negligible ⁶	
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapours.	Very low risk.	Receptor not present.		Negligible ⁶	Receptor not present.	Negligible ⁶
		Construction / maintenance workers		Very low risk.	Low risk.		Minor adverse	Very low risk.	Negligible
		Users of the existing Saxmundham-Leiston branch line.		Very low risk.	Receptor not present.		Negligible ⁶	Receptor not present.	Negligible ⁶
	Human health: Off-site	Farmers / workers on adjoining agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
		Pedestrians / cyclists / horse riders accessing roads and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapour which may have migrated off-site.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
		Residents in adjacent properties.		Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
	Controlled Waters	Principal Bedrock and Secondary A / Undifferentiated Superficial aquifers.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Low risk.		Negligible	Low risk.	Negligible
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Low risk.		Negligible	Low risk.	Negligible
		The River Fromus and Hundred River and ponds	Lateral migration of contaminated groundwater with	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible

⁶ Removal of this receptor at construction automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.	
		and drains within 50m of the site.	discharge to surface watercourses as base flow.						
			Discharge of contaminants entrained in groundwater and / or surface water run-off followed by overland flow and discharge.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible
		Future on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Receptor not present.	Receptor not present.		Negligible	Receptor not present.	Negligible
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Receptor not present.		Negligible	Receptor not present.	Negligible
		Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and / or livestock.	Very low risk.	Receptor not present.		Negligible	Receptor not present.	Negligible
		Crops and livestock (off-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.		
<p>Off-site:</p> <p>Made Ground associated with the construction and operation of the adjacent railway line and roads.</p> <p>Made Ground / fill material associated with the former pits and brick works located within 50m of the site.</p> <p>Farmland surrounding the site. Potential for unmapped farmers tips.</p> <p>Former rifle ranges located adjacent to the site at Saxmundham.</p> <p>Tanks, works, coal yard, gas distribution station with tanks / gasholders, depot and electricity substation located adjacent to the north of the site in Leiston.</p> <p>Leiston Works located 50m to the south of the site.</p> <p>Windmills located 50m south of the site in Leiston.</p> <p>Allotments located 50m south-west of the site around Leiston and Sizewell crossing.</p> <p>Eastlands Industrial Estate located adjacent to the south-east of the site.</p> <p>Abbey Road service station located 50m to the north of the site in Leiston</p>	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts and water that may have migrated onto site.	Very low risk.	Receptor not present.		Receptor not present.	Negligible ⁶		
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Very low risk.	Receptor not present.		Negligible ⁶	Receptor not present.	Negligible ⁶	
		Construction / maintenance workers		Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible	
		Users of the existing Saxmundham-Leiston branch line.		Very low risk.	Receptor not present.		Negligible ⁶	Receptor not present.	Negligible ⁶	
	Controlled Waters	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Low risk.		Negligible	Low risk.	Negligible	
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Low risk.		Negligible	Low risk.	Negligible	
		The River Fromus and Hundred River.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible	
			Discharge of contaminants entrained in groundwater and / or surface water run-off followed by overland flow and discharge.	Very low risk.	Very low risk.		Negligible	Very low risk.	Negligible	
		Property / services	Existing on-site services.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.		Very low risk.	Negligible	Very low risk.	Negligible

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Construction Phase Risk Assessment (with primary and tertiary mitigation measures).	Classification of Effect.	Secondary mitigation measures.	Construction Phase Risk Assessment (with primary, tertiary and secondary mitigation measures).	Residual Effects.
<p>and coach and bus station located 10m to the south-west of the site in Saxmundham.</p> <p>Leiston Press, a tyre dealer and pest and vermin control company located 50m to the south of the site in Leiston.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Receptor not present.	Negligible		Receptor not present.	Negligible
		Crops and livestock (on-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Receptor not present.	Negligible ⁶		Receptor not present.	Negligible ⁶

Table 1.5: Rail improvement works operational phase impact assessment.

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment with primary, tertiary and secondary mitigation.	Residual Effects.	
<p>On-site: Made Ground associated with the roads which cross the site and the construction of the existing railway line.</p> <p>A range of inorganic and organic contaminants including the potential for asbestos. Fuels and oils attributed to spills from vehicles on the roads included within the site boundary, plus exhaust particulates.</p> <p>Farmland within site boundary. Potential for un-mapped farmers tips.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>	Human health: On-site	Farmers / workers on agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Very low risk.	Receptor not present.	Negligible ⁷	Receptor not present.	Negligible ⁷
		Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapours.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Construction / maintenance workers.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Users of the existing Saxmundham-Leiston branch line.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Human health: Off-site	Farmers / workers on adjoining agricultural land.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Pedestrians / cyclists / horse riders accessing roads and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres and gas / vapour which may have migrated off-site.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Residents in adjacent properties.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Controlled Waters	Principal Bedrock and Secondary A / Undifferentiated Superficial aquifers.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
		The River Fromus and Hundred River and ponds and drains within 50m of the site.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
Discharge of contaminants entrained in groundwater and / or			Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible	

⁷ Removal of this receptor at operation automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment with primary, tertiary and secondary mitigation.	Residual Effects.	
			surface water run-off followed by overland flow and discharge.					
	Property / services	Existing on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Existing off-site structures and services (including archaeological features and Grade II listed buildings).	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
			Future on-site services and structures.	Direct contact of contaminants in soil and / or groundwater with buried services.	Receptor not present.	Very low risk.	Negligible ⁸	Very low risk.
			Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Very low risk.	Negligible ⁸	Very low risk.	Negligible ⁸
		Crops and livestock (on-site).	Direct contact, ingestion, inhalation and uptake of soil and water contamination by crops and/or livestock.	Very low risk.	Receptor not present.	Negligible ⁷	Receptor not present.	Negligible ⁷
		Crops and livestock (off-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion / inhalation / dermal contact by livestock.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
Off-site:		Human health:	Farmers / workers on agricultural land.	Dermal contact with and / or ingestion of contaminants in	Very low risk.	Receptor not present.	Negligible ⁷	Receptor not present.

⁸ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

NOT PROTECTIVELY MARKED

Source	Pathway	Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment with primary, tertiary and secondary mitigation.	Residual Effects.	
<p>Made Ground associated with the construction and operation of the adjacent railway line and roads.</p> <p>Made Ground / fill material associated with the former pits and brick works located within 50m of the site.</p> <p>Farmland surrounding the site. Potential for unmapped farmers tips.</p> <p>Former rifle ranges located adjacent to the site at Saxmundham.</p> <p>Tanks, works, coal yard, gas distribution station with tanks / gasholders, depot and electricity substation located adjacent to the north of the site in Leiston.</p> <p>Leiston Works located 50m to the south of the site.</p> <p>Windmills located 50m south of the site in Leiston.</p> <p>Allotments located 50m south-west of the site around Leiston and Sizewell crossing.</p> <p>Eastlands Industrial Estate located adjacent to the south-east of the site.</p> <p>Abbey Road service station located 50m to the north of the site in Leiston and coach and bus station located 10m to the south-west of the site in Saxmundham.</p> <p>Leiston Press, a tyre dealer and pest and</p>	On-site	Commuters / pedestrians / cyclists / horse riders accessing roads and public rights of way crossing the rail route.	windblown soil-derived dusts and water that may have migrated onto site. Inhalation of contaminants in soil, soil-derived dust, fibres and vapours which may have migrated onto site.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Construction / maintenance workers.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Users of the existing Saxmundham-Leiston branch line.		Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Controlled Waters	Principal Bedrock aquifer, Secondary A and Secondary Undifferentiated Superficial aquifer.	Leaching / migration of contaminants in soil to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk.	Low risk.	Negligible	Low risk.	Negligible
		The River Fromus and Hundred River.	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
			Discharge of contaminants entrained in groundwater and / or surface water run-off followed by overland flow and discharge.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
	Property / services	Existing on-site services.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk.	Very low risk.	Negligible	Very low risk.	Negligible
		Future on-site services and structures.	Migration of contaminated groundwater, ground gas and / or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present.	Very low risk.	Negligible ⁸	Very low risk.	Negligible ⁸
		Crops and livestock (on-site).	Migration of contaminated waters / dust / fibres and subsequent uptake by crops or ingestion /	Very low risk.	Receptor not present.	Negligible ⁷	Receptor not present.	Negligible ⁷

NOT PROTECTIVELY MARKED

Source	Pathway		Contaminant exposure / migration pathway.	Baseline (current) Risk Assessment.	Operation Phase Risk Assessment with primary and tertiary mitigation measures (assuming all mitigation proposed during construction is undertaken).	Classification of Effect.	Operation Phase Risk Assessment with primary, tertiary and secondary mitigation.	Residual Effects.
<p>vermin control company located 50m to the south of the site in Leiston.</p> <p>Contamination risk from herbicides, pesticides, silage, effluent, and fuel oils. Risk of inorganic and organic contamination including metals and hydrocarbons, PCBs, asbestos, etc.</p>			<p>inhalation / dermal contact by livestock.</p>					