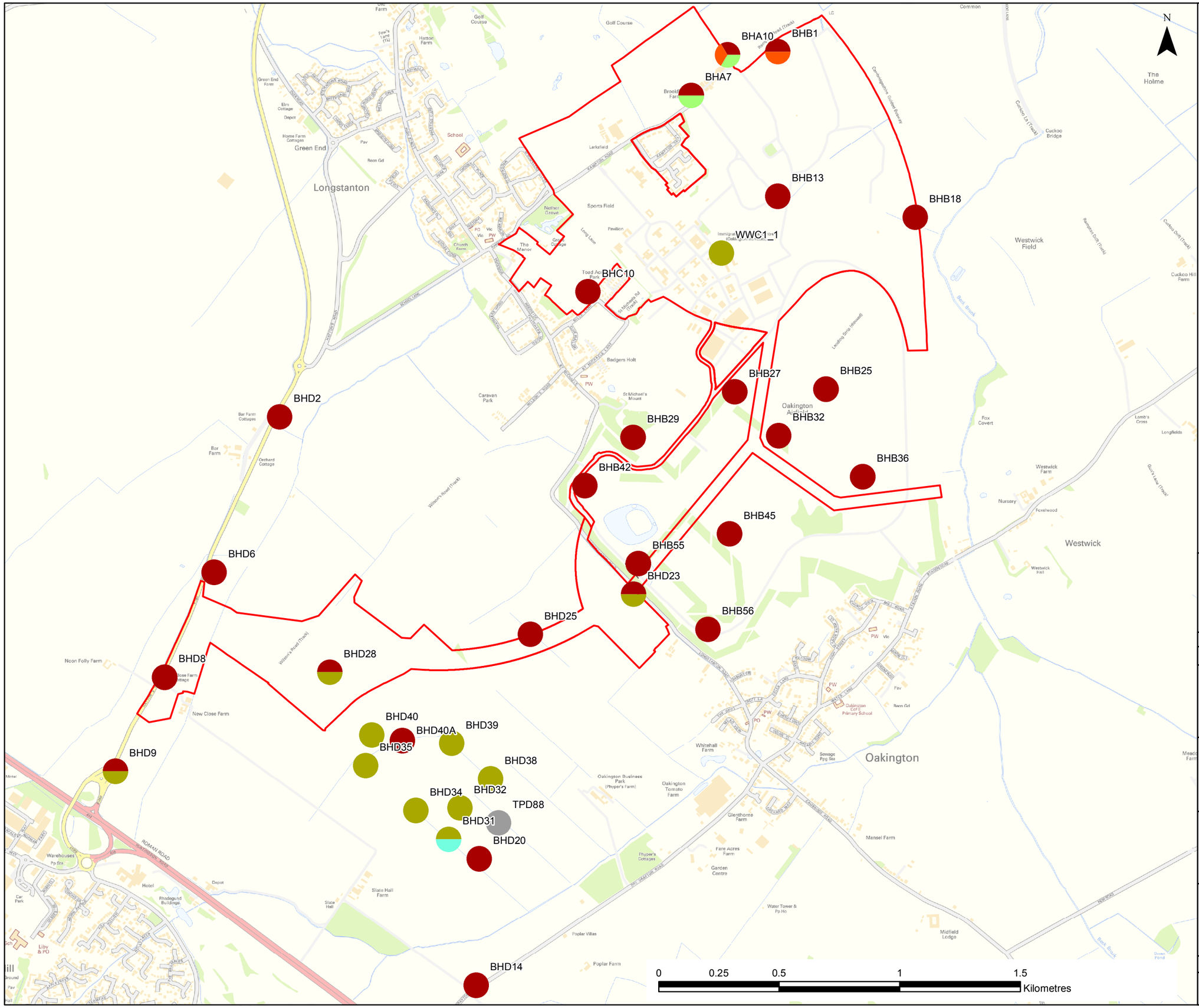
Appendix D

Zetica - UXO Risk Mitigation Plan

Confidential Appendix

Appendix E

Plans showing groundwater exceedances



Legend

GW Inorganic Exceedences

- COPPER
- LEAD
- NICKEL
- ZINC
- BORON
- CHLORIDE
- Site Boundary

*Pie charts show presence / absence of determinands. Proportions expressed do not represent relative concentrations

**NOTE some symbols are offset for clarity

Issue	Description	Drn	Date

Scale 1:15,000 | Page size A3

Hyder

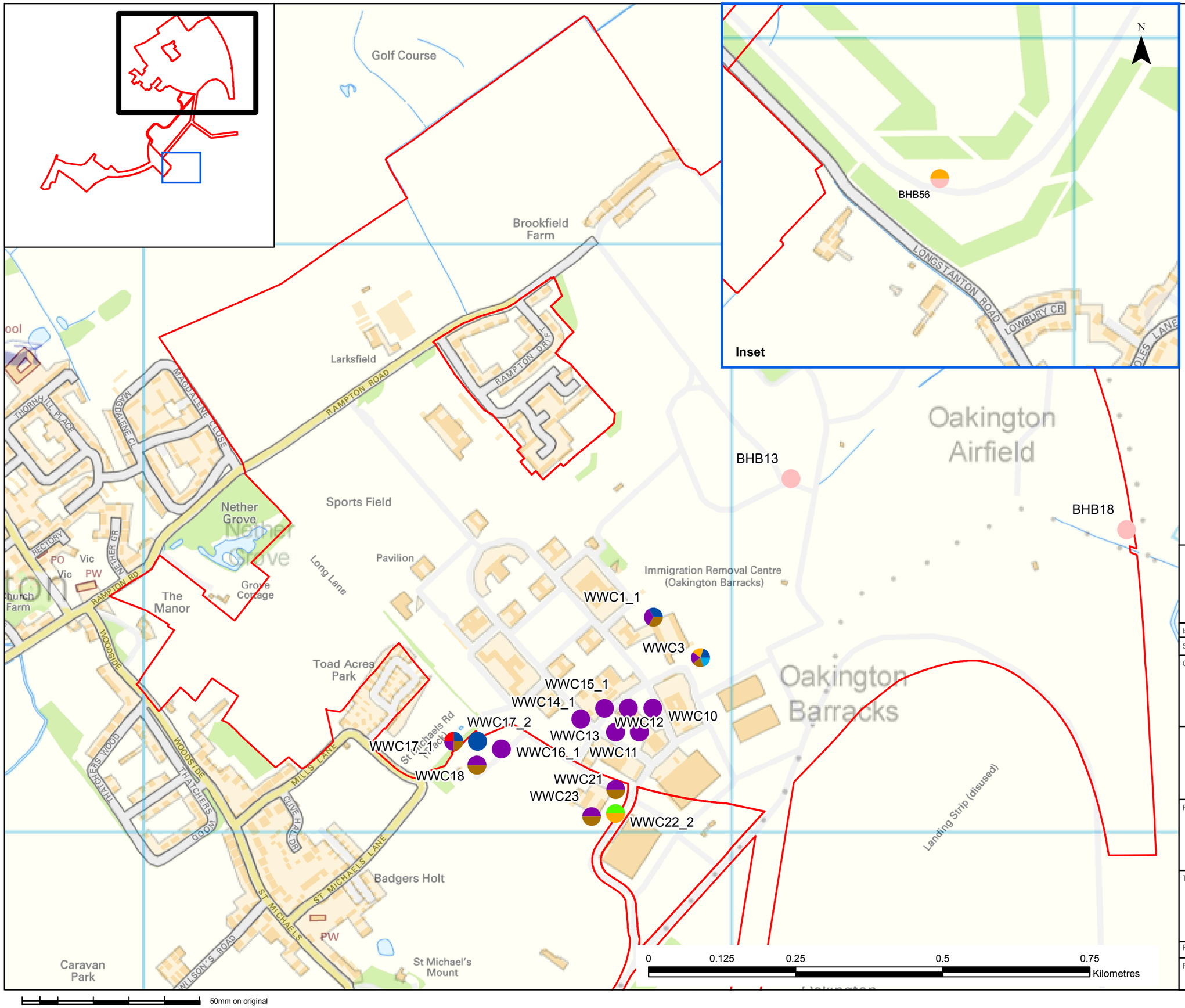
Project
Northstowe HCA

Title
Groundwater Inorganic Exceedences

Report No. UA006156

Figure No.
Groundwater Inorganic 005

Path: K:\UAprojects\UA006156 Northstowe HCA\D-Calcs\GIS\UA006156_GWInorganic.mxd



Legend

GW Organic Exceedences

- BENZENE
- MP XYLENE
- PHENOLS
- VOC
- TPH
- TPH ALIPHATICS
- TPH AROMATICS
- PAH
- Site Boundary

*Pie charts show presence / absence of determinands. Proportions expressed do not represent relative concentrations

**NOTE some symbols are offset for clarity

Issue	Description	Drn	Date

Scale 1:6,047 | Page size A3

Hyder

Project
Northstowe HCA

Title
Groundwater Organic Exceedences

Report No. UA006156

Figure No.
Groundwater Organic 006

Path: K:\UAprojects\UA006156 Northstowe HCA\D-Calcs\GIS\UA006156_GWOrganic.mxd

Appendix F

Conceptual Model / Risk Assessment Information

CONCEPTUAL SITE MODEL

General

The aim of the initial conceptual model and risk assessment is to provide a preliminary identification of the risks to controlled waters, proposed future site users and the surrounding area posed by any contamination present on site. The assessment is based on identification of 'contaminant linkages', i.e. contaminant-pathway-receptor relationships. This approach accords with the guidance that accompanies Part 2A of the Environmental Protection Act of 1990 where land is considered to be contaminated when 'significant harm' is occurring, or where there is the 'significant possibility of significant harm' or where significant pollution of controlled waters is being, or is likely to be caused. In such cases the pollution linkage itself is defined as being 'significant'.

A source of contamination and a pathway to receptors must be present for there to be a risk. The preliminary risk assessment assesses the strength of the link between the source, the pathway and the receptor.

- Source - Contaminant that has potential to cause harm to environmental receptors. In a wider sense, sources can include particular ground conditions, for example the existence of redundant footings, which have the potential to impact on development proposals.
- Pathway - The route by which the source is brought into contact with the receptor. This can include the transport of contamination via groundwater, wind-blown dust, vapours, excavation and deposition etc.
- Receptor - Human beings, other living organisms, physical systems and built structures that could be affected by the source. A receptor will only be affected if a pathway from the source to the receptor is present. Groundwater and surface water systems can be considered as receptors in their own right as their quality is regulated by the statutory bodies, as well as being pathways for contaminant migration to other receptors.

ENVIRONMENTAL RISK ASSESSMENT

Qualitative Methodology

The risk assessment considers the potential sources, receptors and pathways identified in the Conceptual Site Model.

The environmental assessment has been undertaken with due regard to Contaminated Land Guidance Documents issued by the Department of the Environment Food and Rural Affairs (DEFRA). The Guidance requires a risk-based approach; with the potential environmental risk assessed qualitatively using the 'source-pathway-target' pollutant linkage concept contained in Part 2A of the Environment Protection Act. Unless specifically stated as relating to 'Contaminated Land' as defined in the Environmental Protection Act 1990 (as amended), references to 'contamination' and 'contaminants' relate in general terms to the presence of potentially hazardous substances, in, on or under the subject site.

Based on information presented in

- CIRIA C552 (2001) Contaminated Land Risk Assessment: A guide to good practice; and
- NHBC / EA/ CIEH (2008) R&D Publication 66: (Volume 1) Guidance for the Safe Development of Housing on Land Affected by Contamination
- DEFRA (2012) Environmental Protection Act 1990: Part 2A. Contaminated Land Statutory Guidance

Risk assessment considers the identified sources, the potential receptors and the pathways linking them together.

The designation of risk is based upon the consideration of both:

a **the severity of the potential consequence -** this takes into account both the potential severity of the hazard and the sensitivity of the receptor

b **the magnitude of probability** (i.e. likelihood) - this takes into account both the presence of the hazard and receptor and the integrity of the pathway

Severity (consequence) can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term. Definitions of different categories of severity are detailed in Table 1 below.

Probability can be defined as the chance of a particular event occurring in a given period of time. Definitions of different categories of probability are detailed in Table 2 below.

A pollutant linkage must first be established before tests for probability and consequence are applied. If there is no pollutant linkage then there is no potential risk.

Table 1 - Classification of Potential Consequence (Severity)

Classification	Human Health	Controlled Water	Built Environment[1]	Ecosystems[2]
Severe	Short term (acute) risk to human health. Concentrations present likely to result in "significant harm" as defined by Part 2A.	Substantial pollution of sensitive water resources.	Catastrophic damage to buildings, structures or the environment, including building collapse.	Major damage to aquatic or other ecosystem, which is likely to result in a substantial adverse change or irreversible change in its functioning or harm to a species of special interest.
Medium	Chronic damage to human health. Concentrations present that could result in significant harm.	Pollution of sensitive water resources or small scale pollution of sensitive water resources	Significant damage to buildings, structures or the environment making it unsafe to occupy, or damage that may impair a scheduled ancient monument.	Significant damage to aquatic or other ecosystems or organism forming part of an ecosystem, that could endanger the long term maintenance of a population at that location.
Mild	Slight short term health effects to humans. Exposure to human health unlikely to lead to significant harm.	Pollution to non sensitive water resources	Minor damage to sensitive buildings, structures, services or the environment.	Minor or short lived damage to aquatic or other ecosystems.
Minor	Non permanent health effects to human health (easily prevented by means such as personal protective clothing etc)	Insubstantial pollution to non-sensitive water resources	Easily repairable effects of damage to buildings or structures	Harm (although not necessarily significant harm which may result in financial loss or expenditure to resolve e.g. loss of plants in a landscape scheme).

1. Property includes crops including timber, produce grown domestically (gardens or allotments for consumption), livestock, other owned or domesticated animals or wild animals which are subject to shooting or fishing rights. It also includes buildings, meaning any structure or erection, but does not include plant or machinery within a building or buried services.

2. Where ecological system effects relate to a Site of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Marine Nature Reserve (MNR), and areas of Special Protection for Birds, a "European site", or any habitat or site afforded protection under the Wildlife & Countryside Act 1981 and The Conservation of Habitats and Species Regulations 2010, i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites.

Table 2 Classification of Probability

(only applies if there is a possibility of a pollutant linkage being present)

High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an even will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an even could occur. However it is by no means certain that even over a longer period such an event would take place and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Table 3 Classification of Risk

Once the severity and probability have been classified for a pollutant linkage they can be compared to produce a risk category from very high risk to very low risk as shown in the matrix below.

Consequence	**Risk**			
Severe	Moderate/Low	Moderate	High	Very High
Medium	Low	Moderate/Low	Moderate	High
Mild	Very Low	Low	Moderate/Low	Moderate
Minor	Very Low	Very Low	Low	Moderate/Low
Probability	Unlikely	Low	Likely	High

Table 4 Risk Classification Descriptions

Risk Term	Description
Very High Risk	There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action or there is evidence that significant harm to a designated receptor is already occurring.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However it is either relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that such harm would be relatively mild. Some remediation work may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely, at worst, that this harm if realised would normally be mild. Any subsequent remediation works are likely to be relatively limited.
Very Low Risk	It is a low possibility that harm could arise to a receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Appendix G

Response from SCDC

Alison Pugh

From: Bord Helen <Helen.Bord@scambs.gov.uk>
Sent: 30 July 2014 15:07
To: Alison Pugh
Cc: Kearney Greg; Bowser Lois
Subject: RE: Northstowe - Contaminated Land Assessment

Dear Alison
Many thanks for submitting Hyder Consulting's Phase 2 of Northstowe – Geoenvironmental Assessment and Outline Remedial Strategy Report, prepared for HCA.

We have reviewed the report and generally agree with the findings. We do have the following observations to make, mostly in order to confirm proposals for additional works. Currently further works are described as:

1. Further gas monitoring is proposed to bring data up to date, and to re-investigate an area of potentially flawed readings
2. Zetica need to submit their report on UXO to be read in conjunction with this report
3. Site specific Risk Assessment will be prepared for construction workers as they are not subject to long term exposure therefore didn't fall into this category
4. A Detailed Remedial Strategy taking into account the different zones and proposed development areas will be prepared.
5. Additional Investigation is proposed in previously restricted areas such as the former Oakington Immigration Centre in Zone C, and the former Bomb Storage area in Zone B
6. Additional groundwater monitoring is proposed

We agree with this scope of additional works.

Hyder have split the future proposals into areas of contaminants or Type: Inorganic, Organic, Asbestos, Radiological, Groundwater, Gas, Uitilities, Watching Brief and Verification.
We agree with the proposals submitted surrounding these areas.

Regarding Waste Management you have proposed to prepare and submit a Waste Management Plan and we also agree with this.

The conclusions and recommendations summarise the findings and the future proposals and we agree with these too.

As such at this stage the Contaminated Land Condition for the whole area remains in full, but the proposals you have put forward are definitely in line with the requirements of the condition. We should be able to discharge the condition in stages as the works progress.

Kind Regards

Helen Bord | Scientific Officer (Contaminated Land)

South Cambridgeshire District Council

South Cambridgeshire Hall | Cambourne Business Park | Cambourne | Cambridge | CB23 6EA
t: 01954 713444 | **m:** 07980 781421 | **e**: helen.bord@scambs.gov.uk
www.scambs.gov.uk | facebook.com/south-cambridgeshire | twitter.com/SouthCambs

From: Alison Pugh [mailto:Alison.Pugh@hyderconsulting.com]
Sent: 15 July 2014 13:22
To: Bord Helen
Subject: FW: Northstowe - Contaminated Land Assessment

Hi Helen

Further to your email earlier today, please find attached the report and drawings.

Regards

Alison

From: Alison Pugh
Sent: 25 June 2014 12:02
To: 'greg.Kearney@scambs.gov.uk'
Cc: Helen.Bord@scambs.gov.uk; 'loas.bowser@scambs.gov.uk'; Philip Harker
Subject: Northstowe - Contaminated Land Assessment

Greg

Further to our conversation, please find attached our contaminated land assessment report for the Phase 2 development at Northstowe.

As discussed Hyder has been commissioned by HCA to undertake this assessment and we are keen to open discussions with you regards the land quality at the site. The report is still in draft stage as some of the drawings need to be amended as the application boundary has altered slightly. I have also attached the drawings indicating where contamination has been recorded as this assists with the understanding of the report.

I will call you next week to see if you have had a chance of reviewing this and discuss any comments / queries. In the meantime if you have any questions please do not hesitate to contact me.

Kind Regards

Alison Pugh MCIWEM C.WEM, CSci., CEnv.
Principal Geo Environmental Consultant / Team Leader (Bristol)

Hyder Consulting (UK) Limited
5th Floor, The Pithay
All Saints Street
Bristol
BS1 2NL

Direct Dial : 0117 3721266
Switchboard : 0117 3721200