A PHASE I DESK STUDY REPORT TO SUPPORT A RESIDENTIAL DEVELOPMENT ON LAND AT:

MAGELLAN WAY, SPALDING



CLIENT: **John Retchless**

REFERENCE: **BJH/17.330/PhaseI**

DATE: **8 September 2017**

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1. TERMS OF REFERENCE

A F Howland Associates Limited was instructed by John Retchless (the 'Client') to carry out a Phase I Desk Study of a plot of land at Magellan Way, Spalding (Fig. 17.330/PhaseI/1). This was required to address part i of condition 3 of planning permission, referenced H16-0330-17, for a single dwelling which will be constructed on an elevated platform partially over an existing pond.

This report presents the background environmental and historical data for the site and surrounding area followed by a qualitative contamination risk assessment. It was prepared for the use of the Client and its advisors and other parties using the contained information do so at their own risk and any duty of care to those parties is specifically excluded. The report has been carried out in accordance with accepted best practice and methodologies (BSI, 2013) (DEFRA and Environment Agency, 2004).

2. SITE LOCATION

The site is located approximately 1.2 km to the south of Spalding at National Grid reference 524362, 321704 and at an elevation of between 2 and 5 m above Ordnance Datum (aOD).

3. GEOLOGY

The regional geology of the area as mapped by the British Geological Survey[1] includes bedrock of the Oxford Clay Formation with overlying superficial Tidal Flat Deposits. The findings of a nearby borehole record (TF22SW20) from approximately 180 m to the east of the site, and available from the BGS[1], recorded superficial deposits comprising fen silt and clay to 5.5 m, channel sand to 12.8 m and then glacial sand and gravel to 14.0 m.

4. HYDROLOGY

A pond occupies the majority of the site which formed within a man-made 'borrow pit' excavated to provide construction materials for the former railway along the northern boundary. This has recently been partially filled in the west of the site and anecdotal evidence suggests that the fill comprised vegetable and packaging waste from a local factory. The River Welland lies approximately 70 m from the eastern boundary of the site. A single abstraction licence from the River Welland for spray irrigation purposes is located

[1] http://mapapps.bgs.ac.uk/geologyofbritain/home.html

204 m to the east of the site. A zone 3 floodplain surrounds the river and extends over the site and surrounding area.

The Oxford Clay Formation and the Tidal Flat Deposits are classified as unproductive, the site is not located within a source protection zone and there are no groundwater abstraction licences within 1 km of the site.

5. HISTORICAL INFORMATION

From the late nineteenth century the site was identified as an open field with the Great Northern and Great Eastern Railway adjacent to the north eastern boundary. A pond was not annotated on the site until the 1968 map but the topography of the site in the late nineteenth century matches that of this later edition. It is assumed that the pond has therefore been present since this date and apart from a slight change to its extent towards the north western boundary this remains to the present day.

In the surrounding area a rail track was present adjacent to the eastern boundary from the late nineteenth to the late twentieth century when it was replaced by a road. Residential dwellings were present adjacent to the River Welland to the east from the late nineteenth century. The remainder of the surrounding area comprised open fields some of which are annotated as *Nursery* and two linear ponds were present adjacent to the railway approximately 100 m to the northwest. By the mid to late twentieth century buildings were present of site to the northwest and northeast which were annotated as *Nursery* and *Store* respectively. Other than a general increase in the density of buildings in the surrounding area there have been no further significant changes to present day.

An environmental database report, which is included in Appendix B, identifies the historical use of the site to include nurseries although these are considered to be outside of the site area as discussed above. In the wider area, but less than 400 m away, further historical land uses include sewage works and railway buildings. Other historical industrial uses at a further distance from the site are listed in the environmental database report.

6. HAZARDOUS GASES

Building Research Establishment report BR211 (BRE, 2015) indicates that the site is not within an area where specific protection from radon gas is required.

The environmental database report identifies potentially infilled land on the site which is considered to be the partial infilling of the pond previously discussed. Other potentially infilled land includes an unspecified heap 294 m to the north and a sewage works 311 m to the north. Ponds were also identified on the historical maps 100 m to the northwest which may have become infilled.

7. CURRENT LAND USES SURROUNDING THE SITE

Current land uses surrounding the site identified in the environmental database report include electricity sub stations 19 m to the northwest and 168 m to the west and a petrol station 368 m to the south west.

8. WALKOVER SURVEY

A walkover survey was carried out on the 24 August 2017 to enable identification of the current land uses and other relevant details not otherwise identified from the archival information. The salient features are shown on Figure 17.330/PhaseI/2 appended.

Access was gained from the west off Hudson Road via a timber gate.

The site comprised a roughly rectangular area the majority of which was occupied by a pond. Reeds were growing in the pond, it was covered with duckweed and the water levels were shallow at the time of the site visit. Dense vegetation surrounded the pond apart from in the north of the site, where the new dwelling is to be constructed, where it had recently been cleared. Mature deciduous trees were also present within the north of the site while semi-mature deciduous trees dominated the south. The vegetation also covered slopes which fell steeply from the surrounding ground level towards the pond on the eastern and western boundaries. Gentler slopes fell from the southern and northern boundaries towards the pond.

The northern boundary was marked by a timber fence and lay adjacent to an area of open space with a maintained grass surface and a road beyond. The western boundary was enclosed by timber fencing with a recently constructed housing estate beyond. A timber fence formed the southern boundary with Grosvenor Close beyond. Magellan Way runs along the route of the old railway to the east of the site. This boundary included a metal road barrier, adjacent to the road.

9. DISCUSSION OF ENVIRONMENTAL ISSUES

A pond has occupied the site from the late nineteenth century until present day. A rail track which was present adjacent to the site to the east and the unrecorded disposal of waste within the pond have the potential to have introduced contamination and the latter may present a source of ground gas.

Human end-users are going to be introduced through the proposed development and while the dwelling is to be constructed on a raised platform, the existing ground below this and surrounding the pond presents an exposure route to contaminated soils. However, exposure will be infrequent and therefore it can be considered to represent an 'open space near residential housing' scenario for the purposes of a human health risk assessment. Likewise, the elevated nature of the dwelling allows for a significant void below the floor which would allow venting of any ground gas that may be generated by the infill to the pond on site and the suspected infill off site.

The pond presents a sensitive receptor particularly considering the partial infilling and former railway land adjacent to the site. That said, the pond does not appear to be suffering any ill effects were contamination present. The groundwater is considered to be of low sensitivity and the presence of low permeability deposits reduces the likelihood of lateral migration of contaminants towards the River Welland.

10. PRELIMINARY CONCEPTUAL MODEL

Following a review of the archival information and the walkover survey a preliminary conceptual model was devised to determine the risk to appropriate targets from the potential contaminating activities assessed for the site. This collates the evidence gained and establishes the potential linkages that may exist under the principle of "source-pathway-receptor" and is presented in Table 1 below.

A risk category is determined for the potential linkages and an assessment made of risk and the significance of that risk from professional judgement. Risk assessment classification is included in Appendix D. Where appropriate, further work is recommended to assess whether the potential linkages are realised and a revised conceptual model formulated as part of a Phase II investigation.

It should be noted that an assessment of risk to construction workers suggests that only contamination of acute toxicity might represent an unacceptable risk to the health of construction workers but which should be managed through health and safety procedures.

Source of Contamination	Pathway	Receptor	Probability and Reasoning	Consequence and Reasoning	Risk Classification
Potentially contaminated soils from partially infilled pond and adjacent historical railway use	Direct contact, inhalation, ingestion	Human end-users	**Low likelihood** – pond infill and adjacent railway use may have introduced contamination but infrequent exposure expected in open space area. Domestic gardens not proposed	**Medium** – residential end-use but raised dwelling will give rise to infrequent exposure only	**Moderate/Low Risk**
		Construction workers		**Mild –** short term exposure but can be controlled by use of PPE and suitable hygiene practices	**Low Risk**
	Percolation of leachate / mobile contaminants	Groundwater	**Unlikely** – whilst leachable contamination may be present the strata below the site are unproductive and of low sensitivity	**Minor** – no aquifers present, the site is not in a source protection zone and no potable water abstractions nearby	**Very Low Risk**
		Surface water	**Low likelihood** – the pond on the site may be impacted by the partial infill and the adjacent former railway land but no evidence of existing effects. Contamination unlikely to migrate to River Welland	**Medium** – the pond is considered sensitive	**Moderate/Low Risk**
	Direct Contact	Buildings and Services	**Low likelihood** – contaminants that permeate plastic water supply pipes or are aggressive to concrete are unlikely to be present but their absence should be confirmed	**Medium –** robust receptors	**Moderate/Low Risk**
Partially infilled pond and potentially infilled land off site	Gas migration and accumulation in structures	Human end-users	**Unlikely** – infilled pond may be generating ground gas but there is no pathway into the raised dwelling	**Severe** - acute risk to potential end users	**Low Risk**[1]
		Structures			**Low Risk**[1]
Radon Gas		Human end-users	**Unlikely** – site outside of radon affected area	**Medium** - chronic risk to human end users	**Low Risk**

Notes: [1] a low risk classification is concluded based on the probability and consequence of the lack of a significant gas pathway due to the raised building making this risk low or negligible.

Table 1 – Preliminary Conceptual Site Model

11. SUMMARY AND RECOMMENDATIONS

1. A Phase I Desk Study was undertaken to address condition 3 of planning permission for a residential dwelling at Magellan Way, Spalding which is to be constructed on a raised platform.

2. The site is anticipated to be underlain by a bedrock of Oxford Clay Formation overlain by superficial Tidal Flat Deposits. The Oxford Clay and Tidal Flat Deposits are classified as unproductive. The site does not lie within a source protection zone or drinking water safeguard zone.

3. A pond is present on the site and the dwelling is to be partially constructed over this. The River Welland lies 70 m to the east of the site.

4. The pond has occupied the site since the late nineteenth century until present day although this recently became partially filled with suspected vegetable and packaging waste. This and a former rail track running adjacent to the east of the site have the potential to have introduced contamination.

5. Domestic gardens are not included in the development although there may be infrequent exposure to contaminated soils around the existing pond and construction workers would be handling soil. A moderate/low risk to human end-users and a low risk to construction workers has been identified from direct contact, inhalation or ingestion of contaminated soil and dust.

6. The pond is considered to be at a moderate/low risk from contamination arising from the infill and/or historical rail track. Migration of contamination to the River Welland is unlikely and the groundwater is considered to be at a very low risk.

7. Buildings and services are considered to be at a moderate/low risk from being affected by aggressive chemicals arising from the pond infill and former rail track.

8. Whilst infilled land is identified on the site and potentially off site to the north, the raised dwelling does not offer a pathway for gas to accumulate. A low risk is concluded.

9. Sampling of the soil within the area of infill in the north of the site is recommended followed by analysis of the soil for a general suite of contaminants. An assessment of the risks to human health considering a 'public open space near residential housing' end-use scenario and the risks to the pond should be carried out.

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8 September 2017

APPENDIX A: REFERENCES

BSI. 2013. BS 10175:2011+A1:2013. Code of practice for investigation of potentially contaminated Sites. British Standards Institution. London.

BRE. 2015. BRE 211. Radon: Guidance on protective measures for new buildings. British Research Establishment. Bracknell.

DEFRA AND THE ENVIRONMENT AGENCY. 2004. Model Procedures for the Management of Land Contamination. Contaminated Land Report 11. Environment Agency, Bristol.

APPENDIX B: ENVIRONMENTAL DATABASE REPORT

Groundsure Enviro Insight Reference: GS-4190650

Enviro Insight

Address:	**MAGELLAN WAY, SPALDING, PE11 2FG**
Date:	**17 Aug 2017**
Reference:	**GS-4190650**
Client:	**A F Howland Associates**

NW N NE



W E

SW S SE

Aerial Photograph Capture date:	06-Apr-2015
Grid Reference:	524370,321690
Site Size:	0.30ha

Report Reference: GS-4190650
Client Reference: BJH_17_330

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Overview of Findings

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Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	2	6	12	54
1.2 Additional Information – Historical Tank Database	0	0	0	0
1.3 Additional Information – Historical Energy Features Database	6	0	0	33
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	6
1.6 Potentially Infilled Land	4	0	9	18

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	3
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	2	1
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	2
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	0	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	4

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	1	1	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	1
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	1	0	0	3
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	0	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site?	No	No	Yes	No	Yes	Yes
6.10 Detailed River Network entries within 500m of the site	0	0	3	0	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Are there any Enviroment Agency Zone 2 floodplains within 250m of the study site?	Yes
7.2 Are there any Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Yes
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Medium
7.4 Are there any Flood Defences within 250m of the study site?	Yes
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Not Prone
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Not Applicable

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	2	0	0	0	1	4
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Moderate
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Low
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Moderate
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Negligible
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Moderate
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

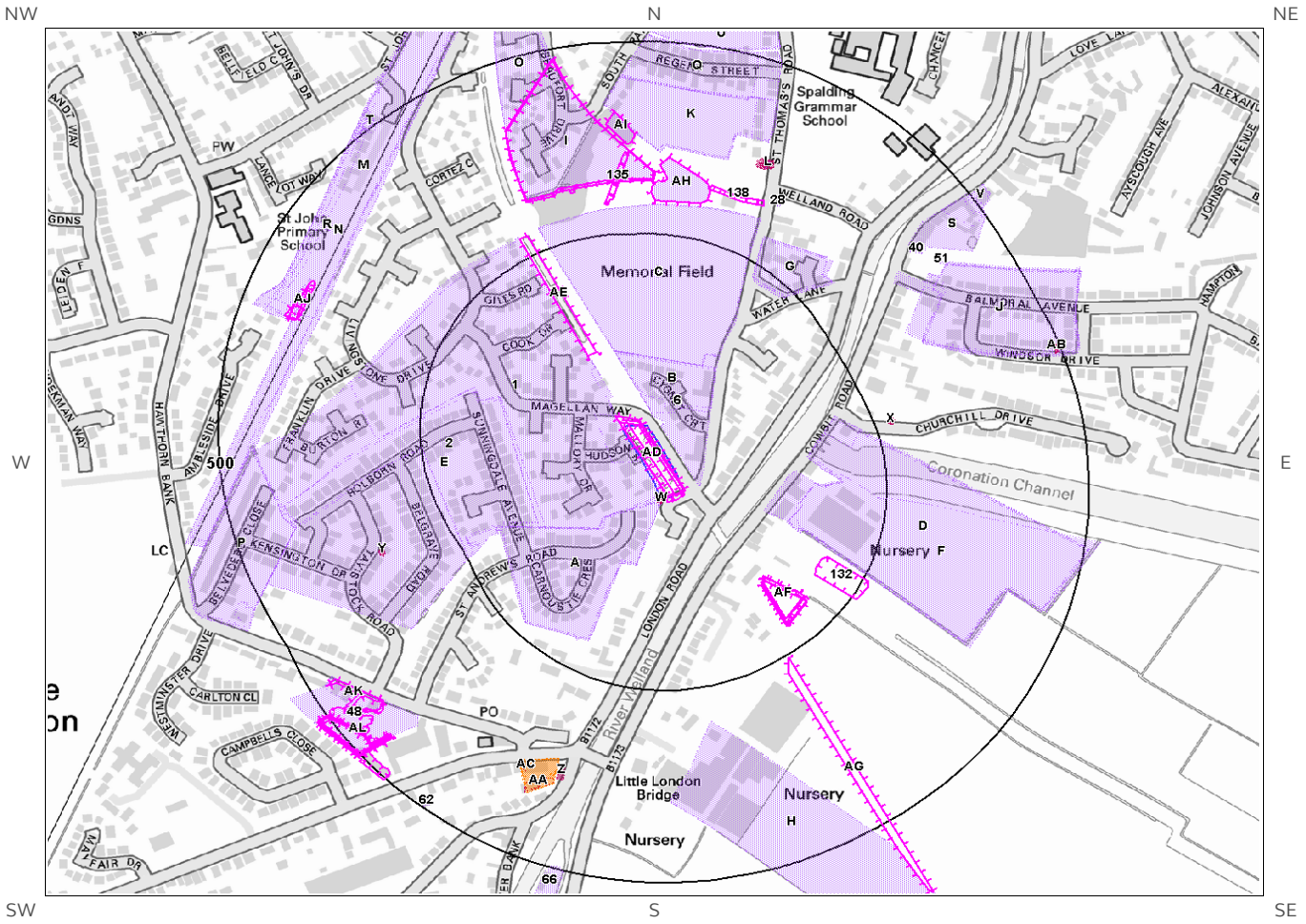
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 74

ID	Distance [m]	Direction	Use	Date
1	0	On Site	Nursery	1980
2	0	On Site	Nursery	1950
3A	2	SW	Nursery	1932
4A	3	SW	Nursery	1950
5A	4	SW	Nursery	1938
6	13	N	Nursery	1938
7B	18	N	Nursery	1950
8B	32	NE	Nursery	1932
9C	88	N	Nursery	1950
10C	89	N	Nursery	1932
11D	103	E	Nursery	1932
12D	134	E	Nursery	1938
13D	134	E	Nursery	1950
14E	135	W	Nursery	1932
15E	135	W	Nursery	1938
16F	140	E	Nursery	1980
17F	140	E	Nursery	1990
18G	230	NE	Nursery	1938
19G	233	NE	Nursery	1950
20G	233	NE	Nursery	1932
21AH	294	N	Unspecified Heap	1990
22H	296	S	Nursery	1980
23H	296	S	Nursery	1990
24I	311	N	Sewage Works	1938
25I	316	N	Sewage Works	1932
26I	316	N	Sewage Works	1932
27I	320	N	Unspecified Works	1950
28	327	NE	Railway Building	1938
29J	336	NE	Nursery	1950
30J	348	NE	Nursery	1903
31J	349	NE	Nursery	1938
32J	349	NE	Nursery	1903
33J	351	NE	Nursery	1932
34K	357	N	Nursery	1938

35K	359	N	Nursery	1932
36K	360	N	Nursery	1950
37L	366	NE	Electric Substation	1980
38L	366	NE	Electric Substation	1990
39AI	367	N	Unspecified Heap	1990
40	396	NE	Railway Building	1887
41S	398	NE	Unspecified Malthouses	1903
42N	401	NW	Railway Sidings	1887
43M	406	NW	Railway Sidings	1938
44M	406	NW	Railway Sidings	1903
45N	408	NW	Railway Sidings	1932
46N	408	NW	Railway Sidings	1950
47O	411	N	Nursery	1938
48	412	SW	Sewage Pumping Station	1932
49O	413	N	Nursery	1932
50O	414	N	Nursery	1950
51	417	NE	Railway Building	1887
52P	423	W	Nursery	1932
53P	423	W	Nursery	1938
54P	425	W	Nursery	1950
55AK	433	SW	Sewage Pumping Station	1938
56Q	439	N	Nursery	1903
57Q	442	N	Nursery	1903
58R	445	NW	Railway Building	1938
59R	447	NW	Railway Sidings	1903
60R	448	NW	Railway Building	1903
61S	459	NE	Malthouses	1903
62	488	SW	Smithy	1903
63T	493	NW	Railway Buildings	1887
64V	494	NE	Unspecified Malthouse	1887
65T	495	NW	Railway Building	1938
66	496	S	Corn Mill	1887
67U	497	N	Nursery	1903
68T	498	NW	Railway Buildings	1903
69T	498	NW	Railway Buildings	1950
70T	499	NW	Railway Building	1938
71T	499	NW	Railway Building	1903
72T	499	NW	Railway Buildings	1932
73U	499	N	Nursery	1903
74V	500	NE	Malthouses	1903

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 0

Database searched and no data found.

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 39

ID	Distance (m)	Direction	Use	Date
75W	0	On Site	Electricity Substation	1972
76W	0	On Site	Electricity Substation	1995
77W	0	SW	Electricity Substation	1986
78W	0	SW	Electricity Substation	1965
79W	0	SW	Electricity Substation	1965
80W	0	SW	Electricity Substation	1988
81X	265	E	Electricity Substation	1988
82X	265	E	Electricity Substation	1965
83X	265	E	Electricity Substation	1986
84X	265	E	Electricity Substation	1965
85X	266	E	Electricity Substation	1995
86X	267	E	Electricity Substation	1972
87Y	333	SW	Electricity Substation	1995
88Y	334	SW	Electricity Substation	1972
89Y	335	SW	Electricity Substation	1986
90Y	335	SW	Electricity Substation	1965
91Y	335	SW	Electricity Substation	1965
92Y	335	SW	Electricity Substation	1988
93L	363	N	Electricity Substation	1992
94L	363	N	Electricity Substation	1986
95L	366	N	Electricity Substation	1998
96L	366	N	Electricity Substation	1996
97L	366	N	Electricity Substation	1996
98L	366	N	Electricity Substation	1967
99L	366	N	Electricity Substation	1973
100L	368	NE	Electricity Substation	1982
101Z	370	S	Electricity Substation	1967

102AC	384	SW	Electricity Substation	1995
103Z	388	S	Electricity Substation	1986
104AA	388	S	Electricity Substation	1965
105AA	388	S	Electricity Substation	1988
106AA	398	SW	Electricity Substation	1972
107AA	398	SW	Electricity Substation	1965
108AB	491	E	Electricity Substation	1972
109AB	491	E	Electricity Substation	1967
110AB	493	E	Electricity Substation	1995
111AB	493	E	Electricity Substation	1986
112AB	493	E	Electricity Substation	1965
113AB	493	E	Electricity Substation	1988

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 6

ID	Distance (m)	Direction	Use	Date
114AC	362	S	Garage	1967
115AC	362	S	Garage	1965
116AC	362	S	Garage	1988
117AC	362	S	Garage	1965
118AC	362	S	Garage	1986
119AA	362	S	Garage	1972

1.6 Potentially Infilled Land

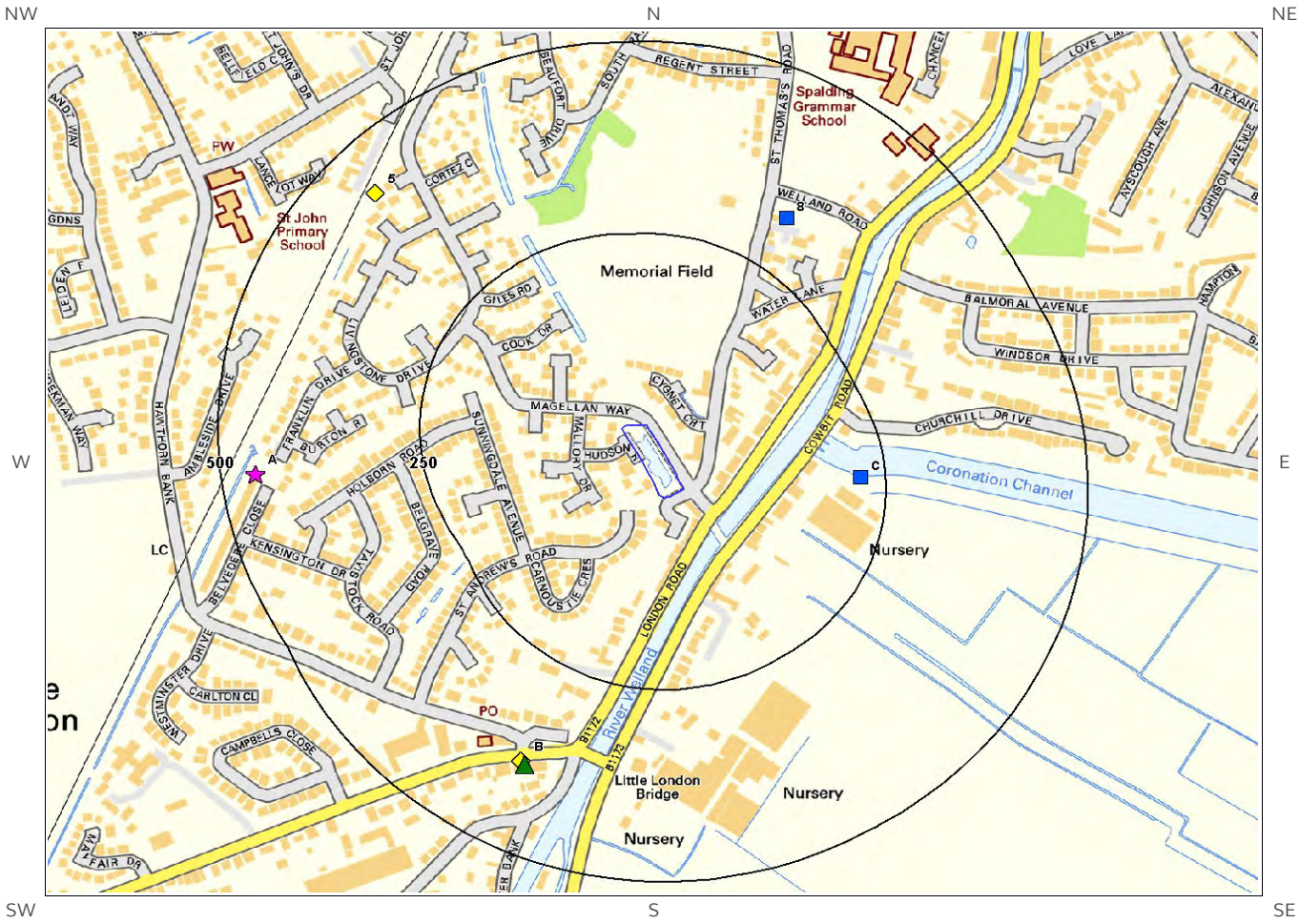
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 31

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date

120AD	0	On Site	Pond	1950
121AD	0	On Site	Pond	1990
122AD	0	On Site	Pond	1980
123AD	0	On Site	Pond	1887
124AE	103	NW	Ponds	1990
125AE	103	NW	Ponds	1980
126AF	149	SE	Pond	1932
127AF	151	SE	Pond	1950
128AF	151	SE	Pond	1980
129AF	151	SE	Pond	1990
130AF	153	SE	Pond	1903
131AF	155	SE	Pond	1887
132	192	SE	Ponds	1990
133AG	254	SE	Ponds	1990
134AG	254	SE	Ponds	1980
135	289	N	Pond	1887
136AH	294	N	Unspecified Heap	1990
137I	311	N	Sewage Works	1938
138	315	N	Pond	1887
139I	316	N	Sewage Works	1932
140I	316	N	Sewage Works	1932
141AI	367	N	Unspecified Heap	1990
142AJ	422	NW	Pond	1887
143AJ	428	W	Pond	1980
144AK	432	SW	Pond	1903
145AL	434	SW	Ponds	1887
146AL	455	SW	Pond	1932
147AL	456	SW	Pond	1903
148AL	456	SW	Pond	1938
149AL	456	SW	Pond	1903
150AL	457	SW	Pond	1950

2. Environmental Permits, Incidents and Registers Map



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- Site Outline
- Search Buffers (m) — 250 / 500
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

3

The following List 2 Dangerous Substance Inventory Site records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
3B	386	SW	524200 321300	Name: Little London Service Station Status: Not Active Receiving Water: Na	Authorised Substances: pH
4B	386	SW	524200 321300	Name: Acco Uk Ltd Status: Not Active Receiving Water: Na	Authorised Substances: pH
5	432	NW	524020 322040	Name: Emg Ford Status: Not Active Receiving Water: Na	Authorised Substances: pH

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

1

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
9B	390	SW	524205 321293	Address: Little London Service Station (Malthurst Petroleum Ltd), London Road, Little London, Spalding, Lincolnshire, PE11 2TW Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

3

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
6C	219	E	524620 321670	Address: BULB STERILISATION PLNT, 45 COWBIT RD, SPALDING, LINCS., PE11 2RH Effluent Type: TRADE DISCHARGES - PROCESS EFFLUENT - NOT WATER COMPANY Permit Number: PR5NF412 Permit Version: 2	Receiving Water: Trib Exeter Drain Status: CONSENT REVOKED - DISCHARGE CEASED (WRA 91, SCHED 10 & 6) Issue date: 31/01/1996 Effective Date: 31-Jan-1996 Revocation Date: 11/06/2003
7C	219	E	524620 321670	Address: BULB STERILISATION PLNT, 45 COWBIT RD, SPALDING, LINCS., PE11 2RH Effluent Type: TRADE DISCHARGES - PROCESS EFFLUENT - NOT WATER COMPANY Permit Number: PR5NF412 Permit Version: 1	Receiving Water: Trib Exeter Drain Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 25/10/1967 Effective Date: 25-Oct-1967 Revocation Date: 30/01/1996
8	320	NE	524528 322008	Address: WELLAND ROAD SPS, WELLAND ROAD, SPALDING, LINCS, PE11 2XZ Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: AW5NF666 Permit Version: 1	Receiving Water: River Welland Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 09/06/1977 Effective Date: 09-Jun-1977 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

2

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1A	459	W	523871 321674	Incident Date: 23-Apr-2002 Incident Identification: 74127 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2A	459	W	523871 321674	Incident Date: 23-Apr-2002 Incident Identification: 74127 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

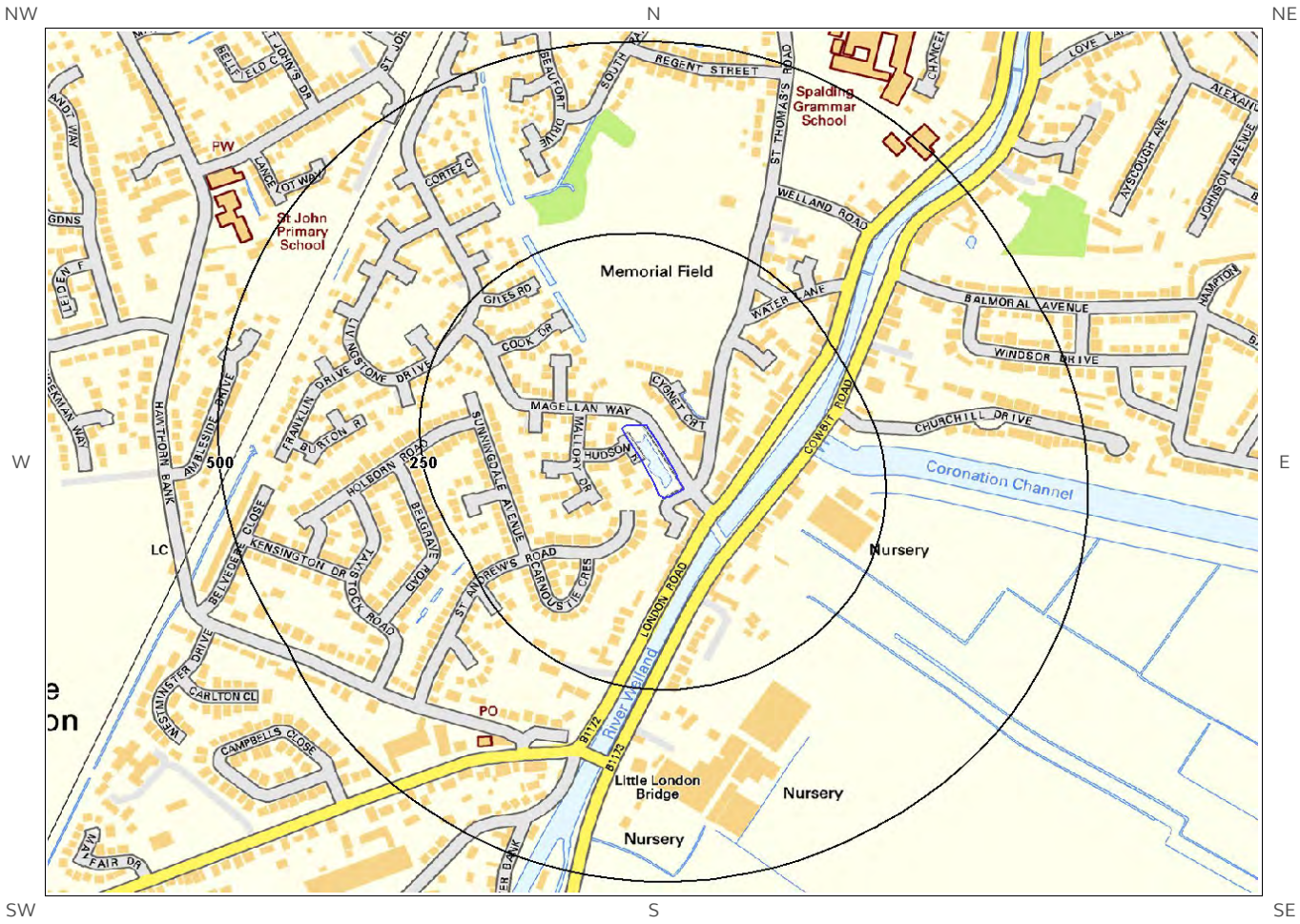
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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Site Outline

250
500
Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

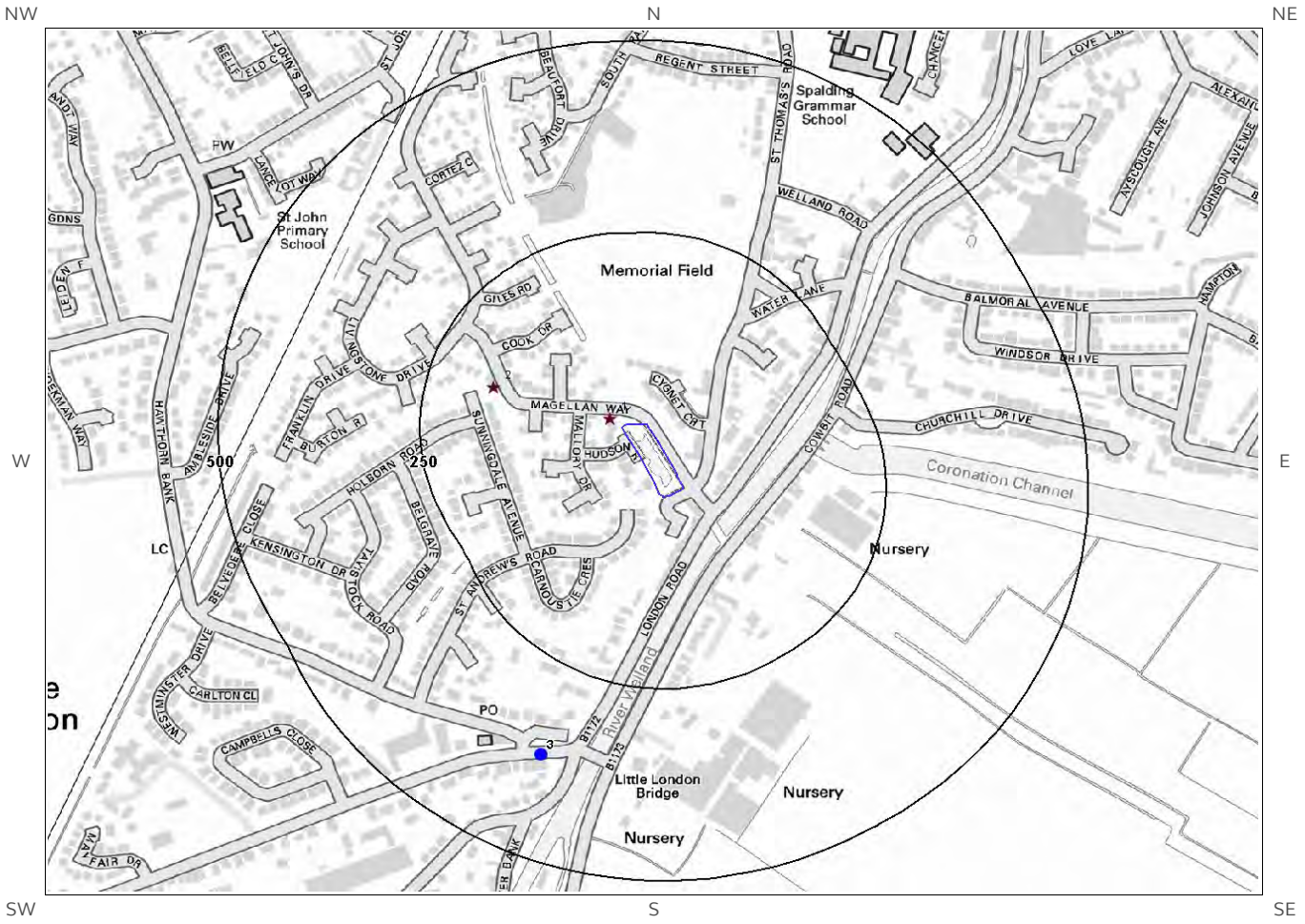
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

4

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1011	E	525400 321500	Site Address: Street Mr T J, Elvander, Clay Lake, Spalding, Lincolnshire, PE12 6BL Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: STR002 EPR reference: EA/EPR/TP3198NV/A001 Operator: Street Mr T J Waste Management licence No: 71027 Annual Tonnage: 5000.0	Issue Date: 09/09/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Bridge Cottage, Clay Lake Correspondence Address: -
Not shown	1170	SE	525200 320800	Site Address: The Ranch Scrapyard, Clay Lake, Spalding, Lincolnshire, PE12 6BL Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RAN002 EPR reference: EA/EPR/PP3892NN/A001 Operator: Mr D A Boswell Waste Management licence No: 73063 Annual Tonnage: 25000.0	Issue Date: 27/03/1997 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: The Ranch Scrapyard Correspondence Address: -
Not shown	1170	SE	525200 320800	Site Address: Boswell Mr D.A., Clay Lake, Spalding, Lincolnshire, PE12 6BL Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BOS001 EPR reference: - Operator: Mr D A Boswell Waste Management licence No: 70918 Annual Tonnage: 5000.0	Issue Date: 19/05/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: The Ranch Scrapyard (transfer) Correspondence Address: Boswell Mr D.A., Clay Lake, Spalding, Lincolnshire, PE12 6BL
Not shown	1170	SE	525200 320800	Site Address: Boswell Mr D.A., Land/ Premises At, Clay Lake, Spalding, Lincolnshire, PE12 6BL Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BOS001 EPR reference: EA/EPR/SP3598NQ/A001 Operator: Mr D A Boswell - T/a: S.g.boswell & Sons. Waste Management licence No: 70918 Annual Tonnage: 5000.0	Issue Date: 19/05/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: The Ranch Scrapyard (transfer) Correspondence Address: -

4. Current Land Use Map



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Site Outline

Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 2

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	19	NW	Electricity Sub Station	524310 321746	PE11	Electrical Features	Infrastructure and Facilities
2	168	W	Electricity Sub Station	524166 321787	PE11	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 1

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
3	368	SW	524225 321308	BP	Mrh Spalding, London Road, London Road, Cradge Bank Road, Little London, Spalding, Lincolnshire, PE11 2TP	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TFD-XCZ	TIDAL FLAT DEPOSITS	CLAY AND SILT

5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
OXC-MDST	OXFORD CLAY FORMATION	MUDSTONE

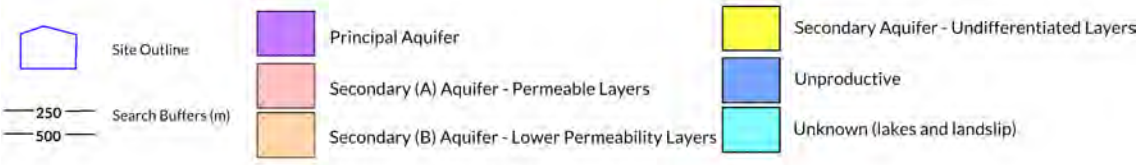
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

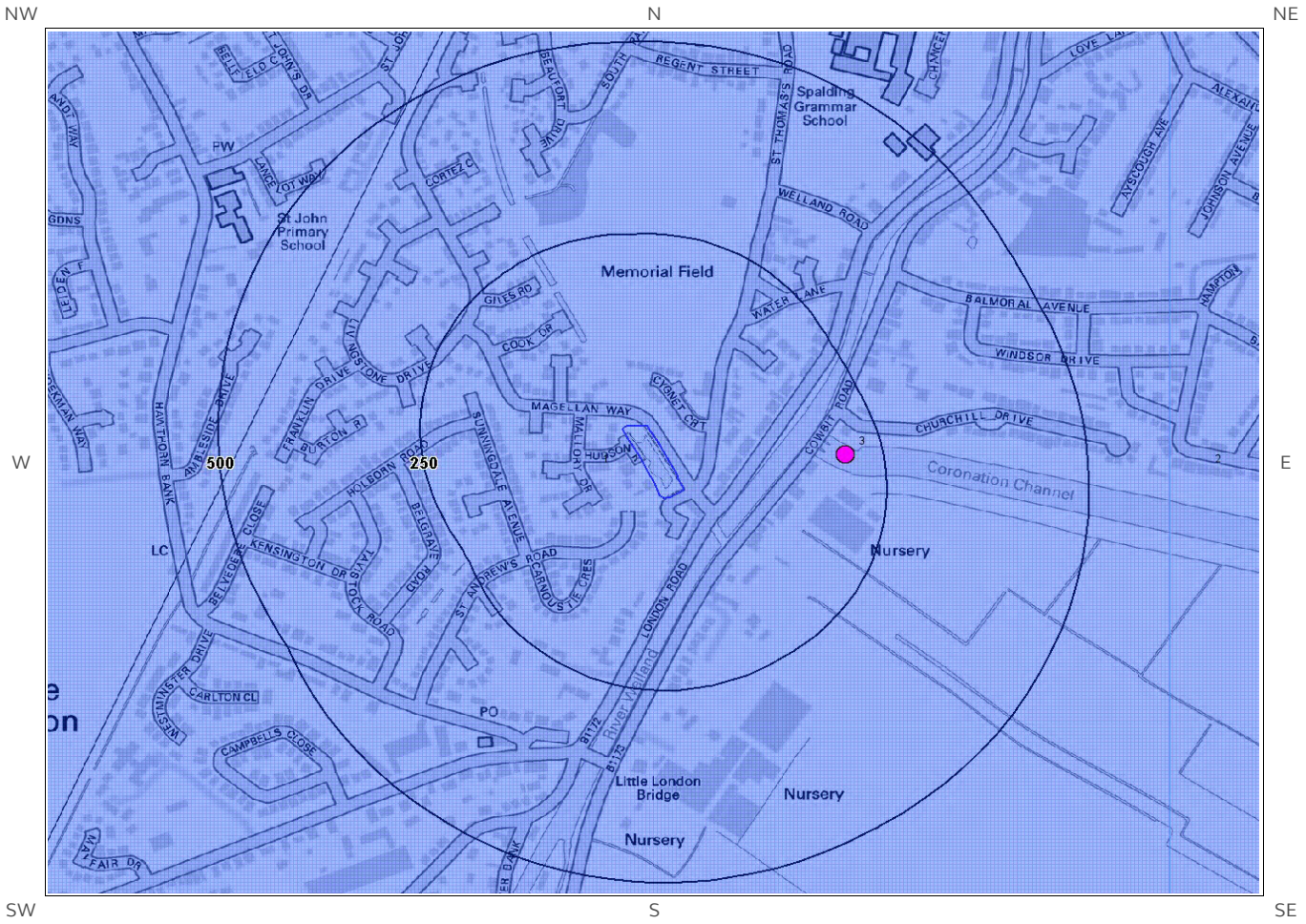
6a. Aquifer Within Superficial Geology



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6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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Site Outline

250 — 500 — Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

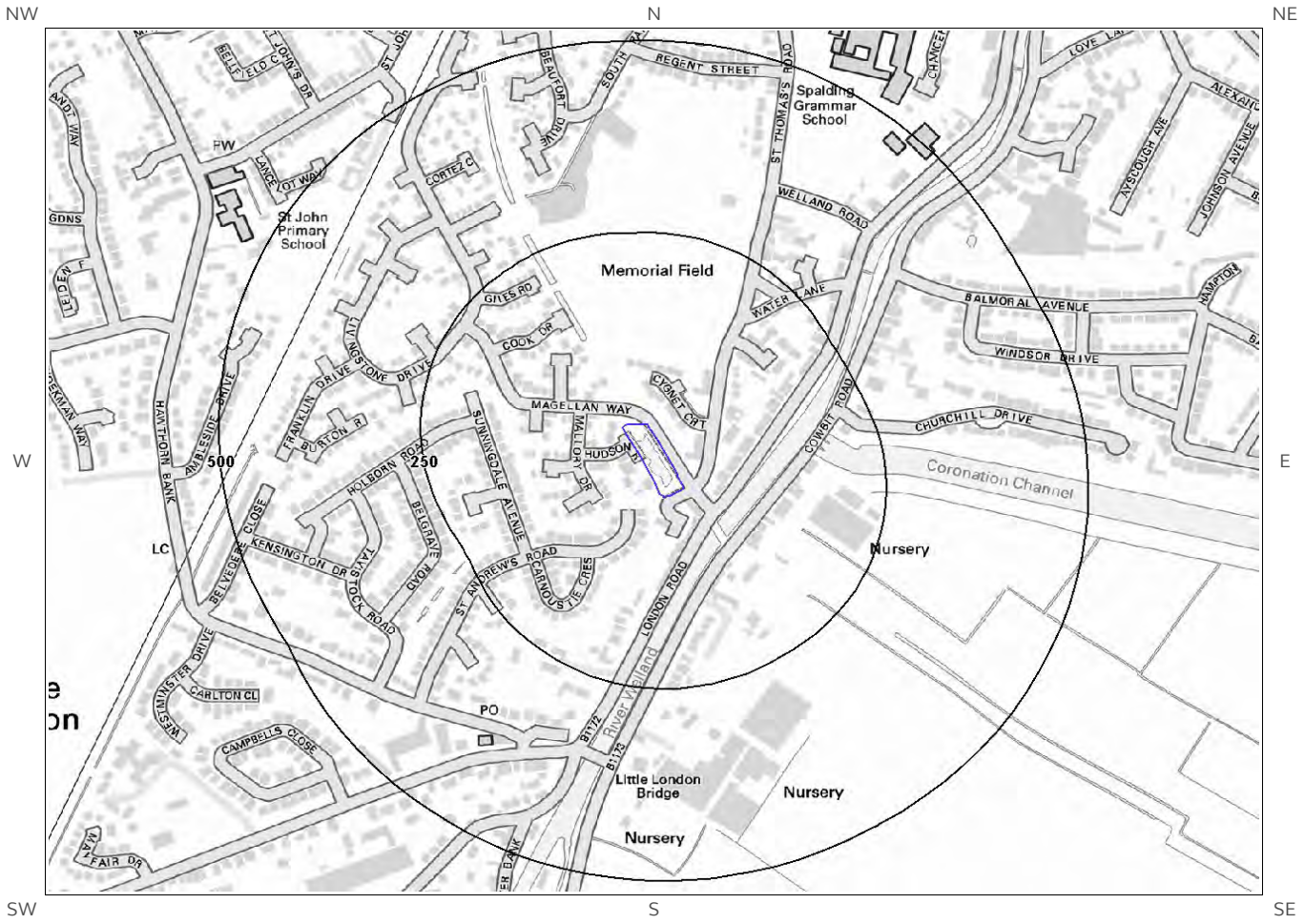
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



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Site Outline

250 Search Buffers (m)
500

Source Protection Zone 1 - Inner Catchment

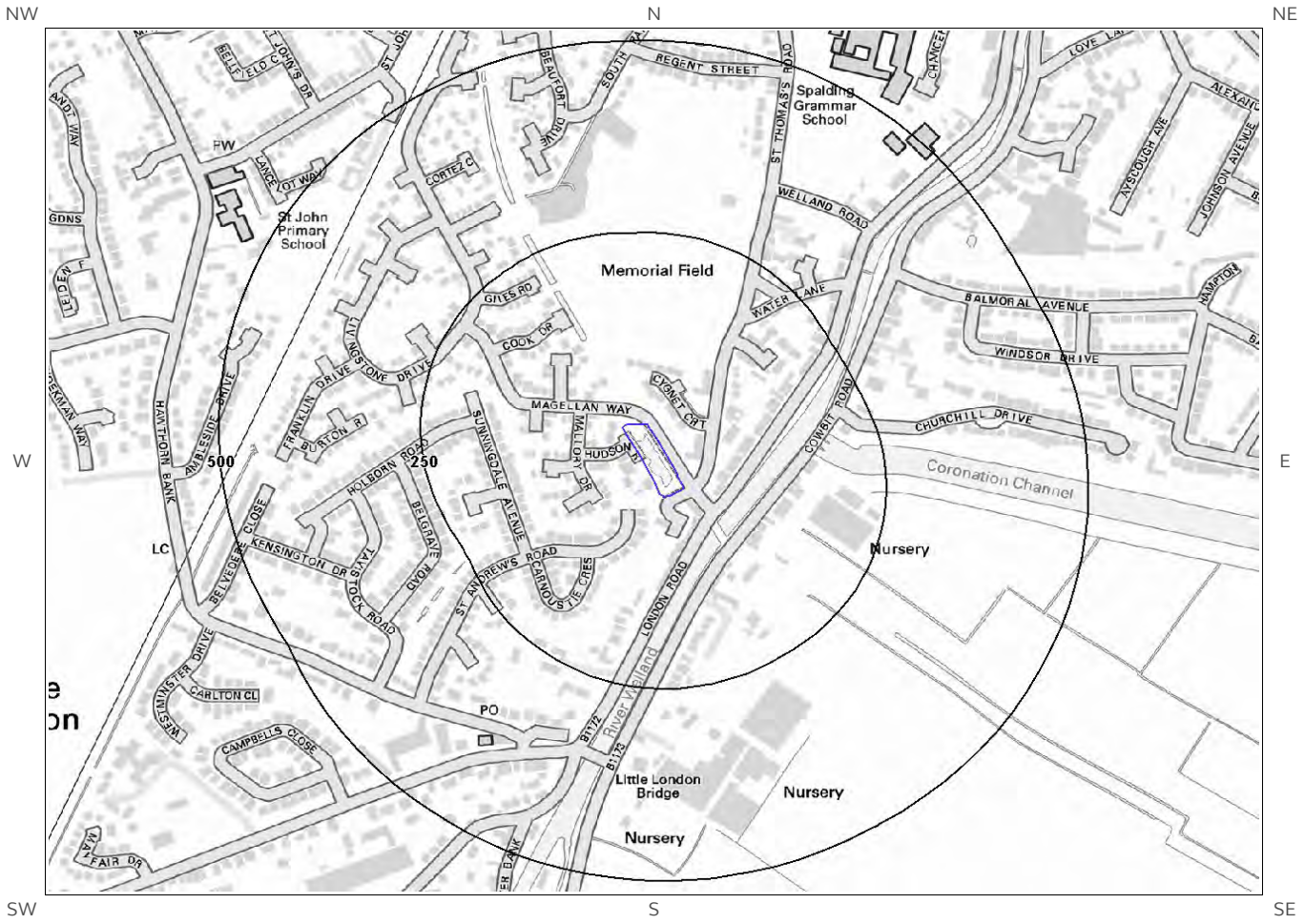
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



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Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

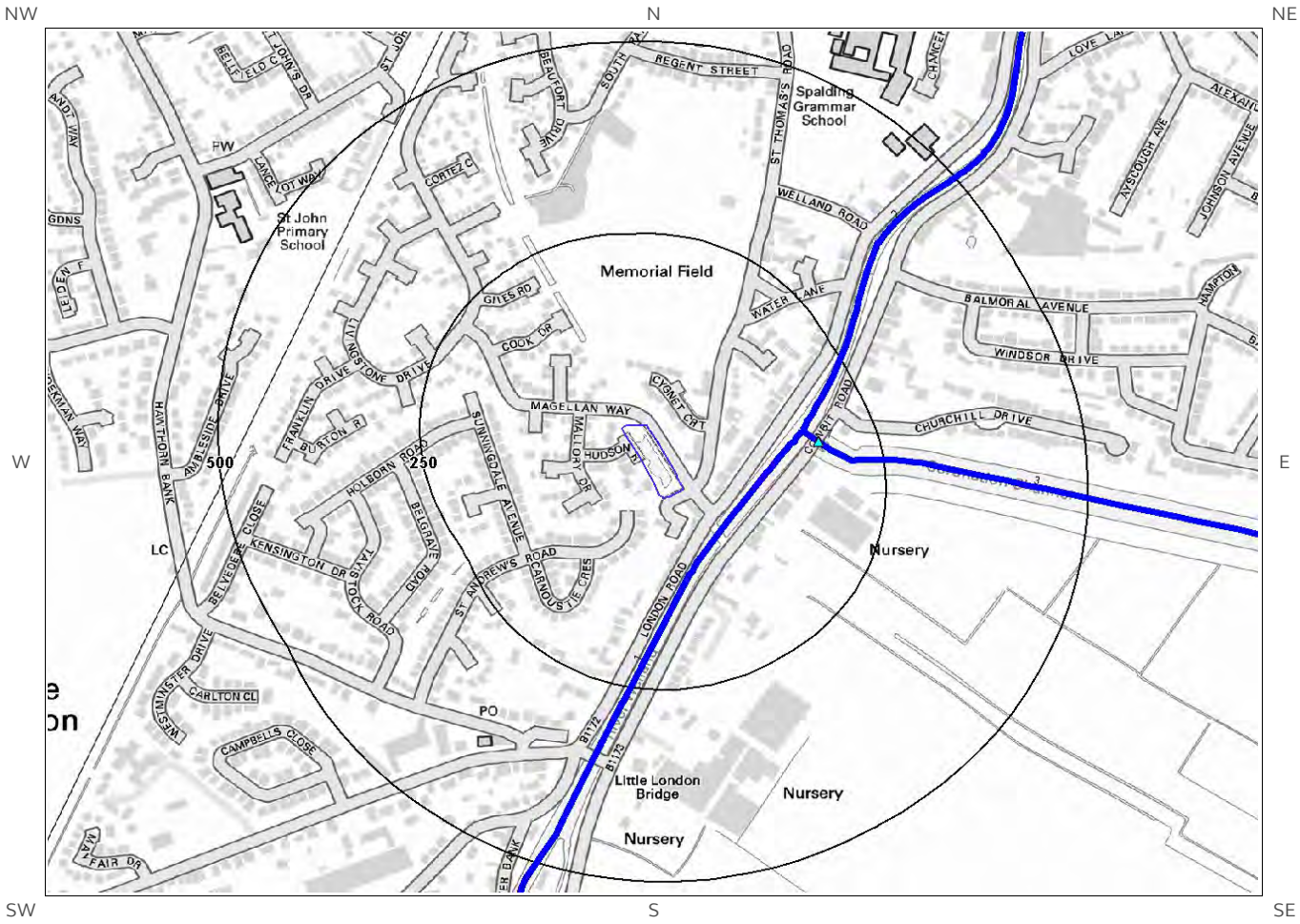
Source Protection Zone 3C - Total Catchment within Confined Aquifer

Potable Water Abstraction Licence

Site Outline

250 500 Search Buffers (m)

6e. Hydrology – Detailed River Network and River Quality



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Site Outline

250 Search Buffers (m)
500

Primary River
Secondary River
Tertiary River
Lake/Reservoir
Underground River (inferred)
General Quality Assessment: Biology
General Quality Assessment: Chemistry

Canal
Canal Tunnel
Culvert
Multiple Channel Culvert
Underground River (Potential Sewer)
Underground River (local knowledge)

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
3	204	E	524600 321700	Status: Historical Licence No: 5/31/14/*S/0113 Details: Spray Irrigation - Direct Direct Source: Surface Water Source Of Supply Point: R Welland (coronation Channel) Data Type: Point Name: C SLOOTEN LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: - Original Start Date: 1/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/2/1966 Version End Date:
Not shown	1406	E	525800 321800	Status: Historical Licence No: 5/31/14/*S/0157 Details: Make-Up or Top Up Water Direct Source: Surface Water Source Of Supply Point: Coronation Channel Data Type: Point Name: LINCOLNSHIRE TRUST FOR NATURE CONSERVATION	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: - Original Start Date: 1/1/1982 Expiry Date: - Issue No: 100 Version Start Date: 1/12/1992 Version End Date:
Not shown	1474	E	525850 321930	Status: Active Licence No: 5/31/14/*S/0157 Details: Make-Up Or Top Up Water Direct Source: Surface Water Source Of Supply Point: Coronation Channel - Spalding Data Type: Point Name: LINCOLNSHIRE WILDLIFE TRUST	Annual Volume (m^3): 2500 Max Daily Volume (m^3): 224 Application No: NS968 Original Start Date: 1/1/1982 Expiry Date: - Issue No: 101 Version Start Date: 8/5/2007 Version End Date:
Not shown	1775	SW	523500 320100	Status: Active Licence No: 5/31/14/*S/0020 Details: Spray Irrigation - Direct Direct Source: Surface Water Source Of Supply Point: R Welland & Drains,cowbit Wash Data Type: Point Name: R CHAPPELL & SONS	Annual Volume (m^3): 1364 Max Daily Volume (m^3): 545.53 Application No: - Original Start Date: 1/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/4/2004 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site? No

Database searched and no data found.

6.9 River Quality

Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site? Yes

6.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	571	S	524200 321100	River Name: Welland (coronation Cut) Reach: New River Spalding...tidal Limit (1) End/Start of Stretch: Start of Stretch NGR	B	B	B	B	B
Not shown	1242	NE	525000 322800	River Name: Welland (coronation Cut) Reach: New River Spalding...tidal Limit (2) End/Start of Stretch: Start of Stretch NGR	B	B	B	B	B
Not shown	1242	NE	525000 322800	River Name: Welland (coronation Cut) Reach: New River Spalding...tidal Limit (1) End/Start of Stretch: End of Stretch NGR	B	B	B	B	B

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

					Chemical Quality Grade				
ID	Distance (m)	Direction	NGR	River Quality Grade	2005	2006	2007	2008	2009
7	177	E	524568 321715	River Name: Welland Reach: New River Spalding Tidal Limit (1) End/Start of Stretch: Sample Point NGR	C	C	B	B	B
Not shown	571	S	524200 321100	River Name: Welland Reach: New River Spalding Tidal Limit (1) End/Start of Stretch: Start of Stretch NGR	C	C	B	B	B
Not shown	571	S	524200 321100	River Name: Welland Reach: Folly River New River Spalding End/Start of Stretch: End of Stretch NGR	B	C	B	B	B
Not shown	942	NE	524864 322531	River Name: Welland Reach: New River Spalding Tidal Limit (2) End/Start of Stretch: Sample Point NGR	C	C	B	B	B
Not shown	1242	NE	525000 322800	River Name: Welland Reach: New River Spalding Tidal Limit (2) End/Start of Stretch: Start of Stretch NGR	C	C	B	B	B
Not shown	1242	NE	525000 322800	River Name: Welland Reach: New River Spalding Tidal Limit (1) End/Start of Stretch: End of Stretch NGR	C	C	B	B	B

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	69	SE	River Name: River Welland Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
2	165	NE	River Name: River Welland Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
3	165	NE	River Name: Coronation Channel Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined

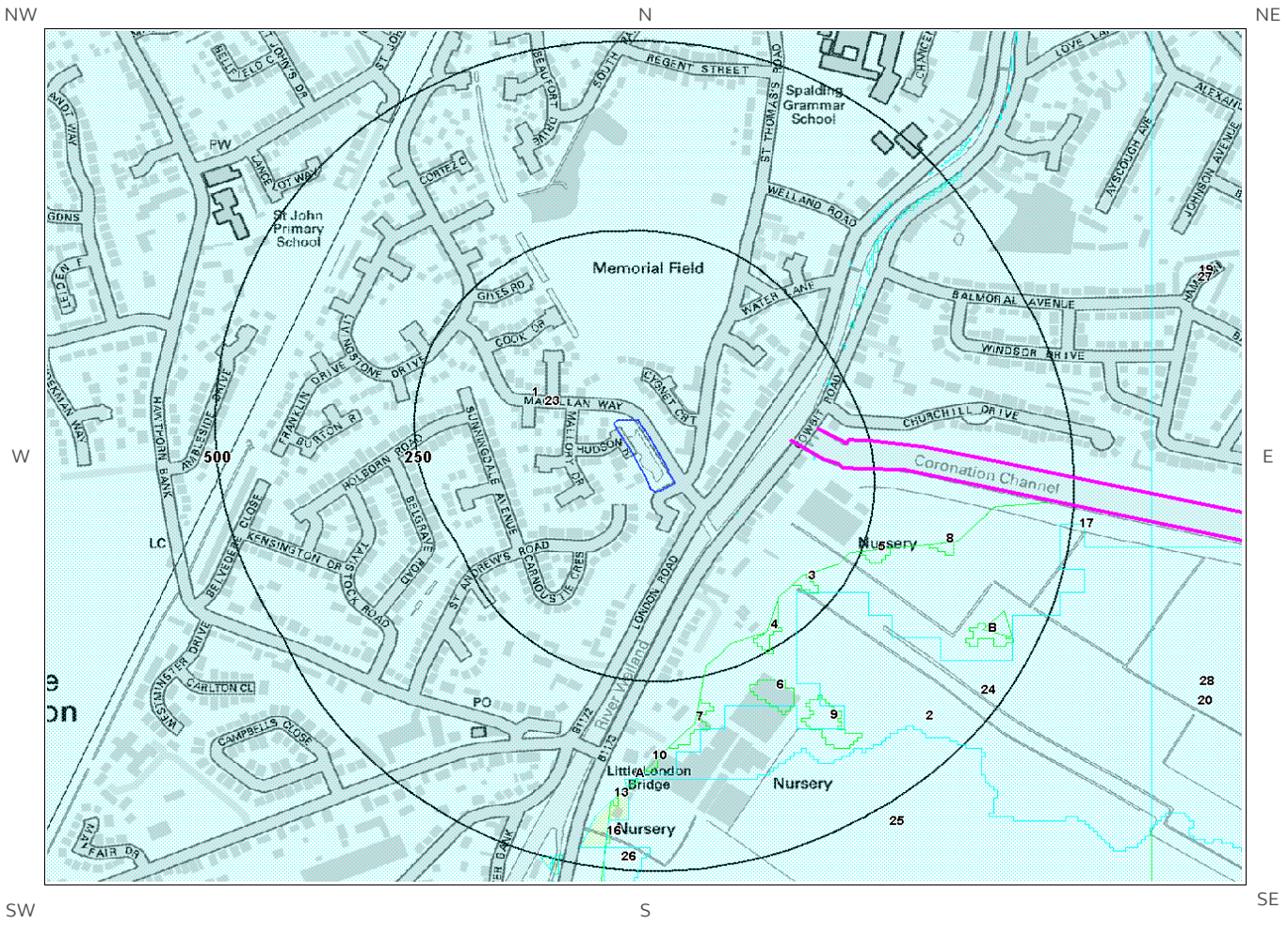
6.11 Surface Water Features

Are there any surface water features within 250m of the study site? Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
0	On Site
58	SE
62	SE
122	NW
154	E
164	E
205	SE
206	NW
230	E

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



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Site Outline

100
250
Search Buffers (m)

Zone 2 Floodplain

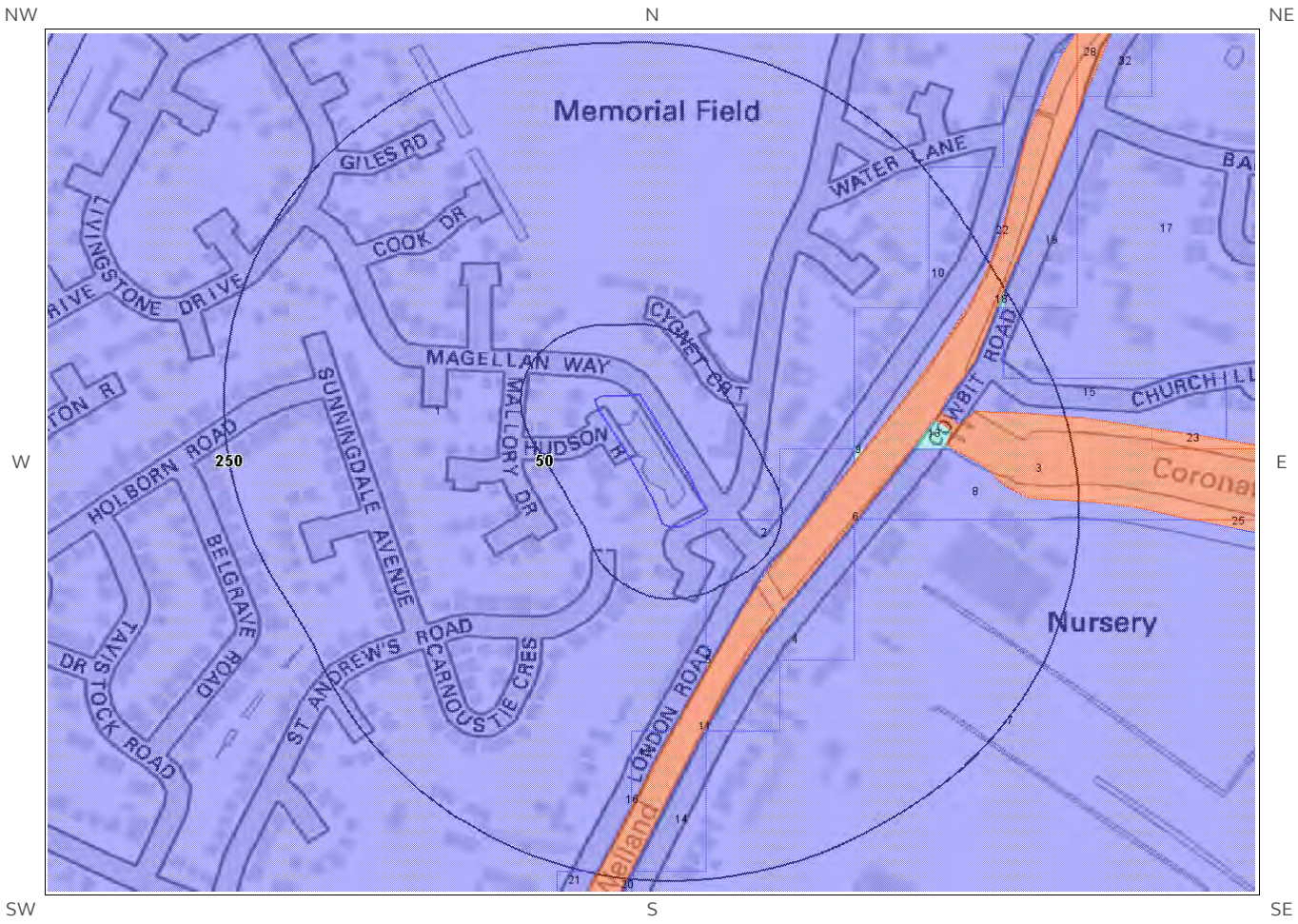
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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Site Outline

100
250
Search Buffers (m)

RoFRaS Rating
Very Low
Low
Medium
High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 2 floodplain? Yes

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	0	On Site	19-Jun-2017	Zone 2 - (Fluvial /Tidal Models)
2	199	SE	19-Jun-2017	Zone 2 - (Fluvial /Tidal Models)
3	199	SE	19-Jun-2017	Zone 2 - (Fluvial /Tidal Models)
4	201	SE	19-Jun-2017	Zone 2 - (Fluvial /Tidal Models)
5	250	E	19-Jun-2017	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 3 floodplain? Yes

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1	0	On Site	19-Jun-2017	Zone 3 - (Fluvial Models)
2	210	SE	19-Jun-2017	Zone 3 - (Fluvial Models)

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Medium

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Medium (greater than 1 in 100 but less than 1 in 30) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance (m)	Direction	RoFRas flood Risk
1	0.0	On Site	Medium
2	4.0	SE	Medium

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? Yes

The following flood defence records are represented as lines on the Flood Map:

ID	Distance (m)	Direction	Update
30	156	E	16-Jun-2017
31	192	E	16-Jun-2017

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? No

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Not Prone

The area is not considered to be prone to groundwater flooding based on rock type.

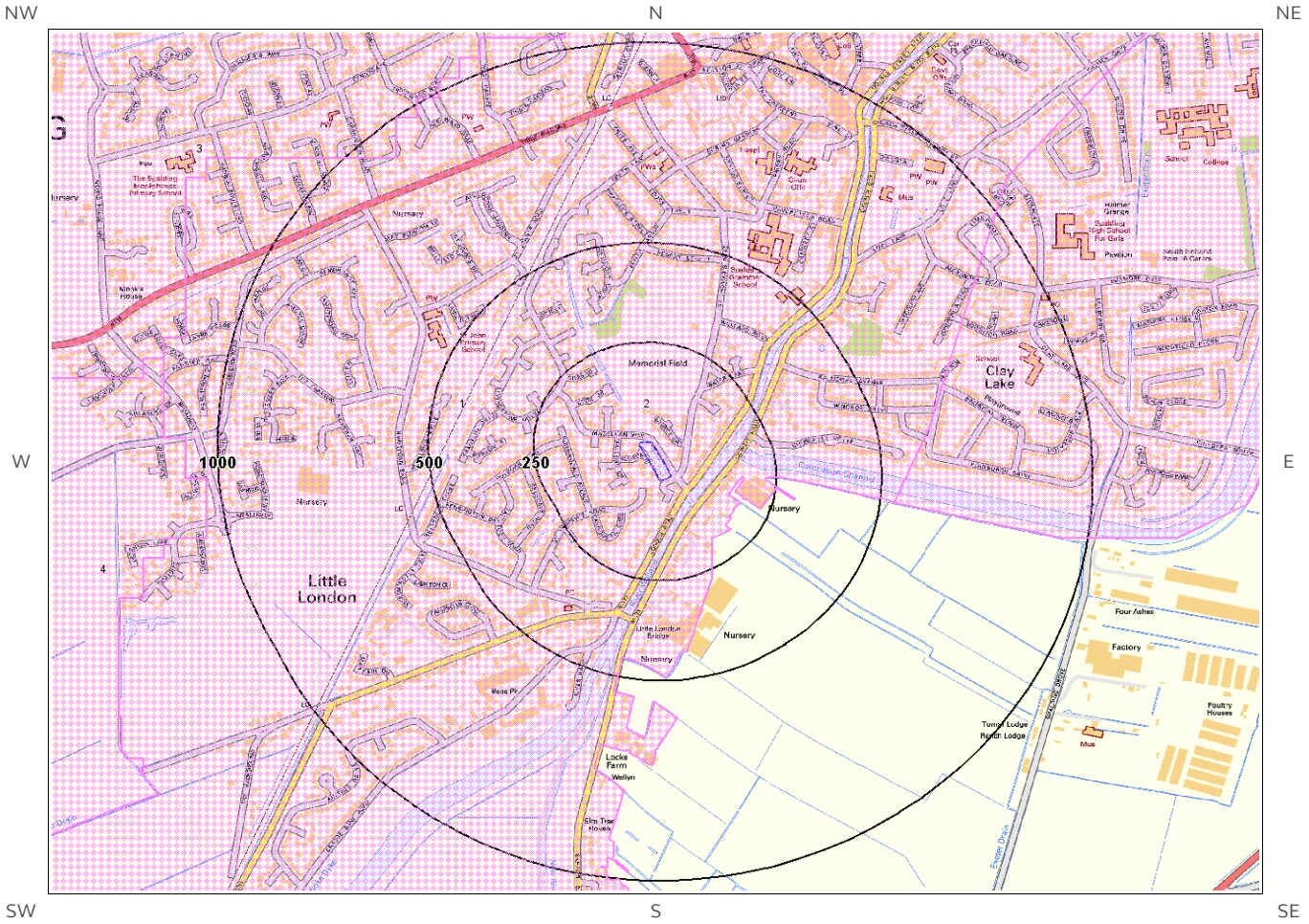
7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Not Applicable

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?	Yes

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

7

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	New	DEFRA
2	0	On Site	Existing	DEFRA
3	918	NW	Existing	DEFRA
4	1029	W	Existing	DEFRA
Not shown	1645	S	New	DEFRA
Not shown	1645	S	Existing	DEFRA
Not shown	1973	SW	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

What is the maximum Shrink-Swell*[*] hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

What is the maximum Running Sand*[*] hazard rating identified on the study site? Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build consider the consequences of soil and groundwater conditions during and after construction. For existing property possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

* This indicates an automatically generated 50m buffer and site.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? No

Database searched and no data found.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No
Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

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Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
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BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

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Tel: 03708 506 506
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Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.
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This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

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https://www.groundsure.com/terms-and-conditions-sept-2016

APPENDIX C: DRAWINGS

Drawing 17.330/PhaseI/1	Site Location Plan
Drawing 17.330/PhaseI/2	Relevant Feature Plan



Scale 1: 50,000 @ A4

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A F Howland Associates
Geotechnical Engineers

Site: Magellan Way, Spalding

SITE LOCATION PLAN

Client : John Retchless

Date : September 2017 **Dwg :** 17.330/Phasel/1

Drawing 17.330/PhaseI/2
Relevant Feature Plan

Photo 1 – Access to the site from Hudson Road via a timber gate



Photo 2 – Recently cut vegetation in the north of the site



Photo 3 – Looking along the western boundary



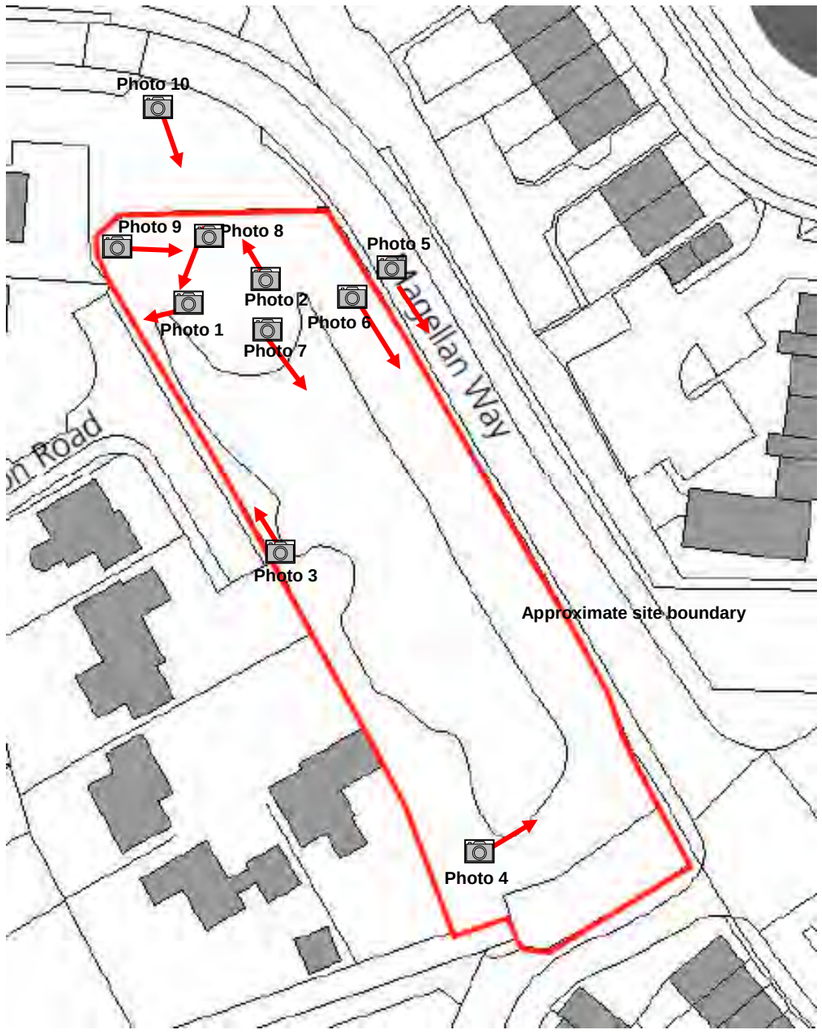


Photo 8 – Pond dominated by reeds and covered in duckweed



Photo 9 – Looking at gently sloping northern area



Photo 10 – Looking south towards the north boundary



Photo 4 – Southern portion of site



Photo 5 – Looking along eastern boundary



Photo 6 – Looking along eastern boundary at steep embankments



Photo 7 – Looking south over pond



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Client:	John Retchless
Site:	Magellan Way, Spalding
Job No.:	17.330
Drawing title:	Relevant Feature Plan
Drawing No.:	17.330/PhaseI/2
Date:	September 2017

APPENDIX D: RISK ASSESSMENT CLASSIFICATION

Classification	Definition	Examples
Severe	Short term (acute) risk to human health. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem, or organism forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from Site into controlled water.
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from Site exceeds the generic, or Site specific assessment criteria. Leaching of contaminants from a Site to an aquifer.
Mild	Pollution of non-sensitive water resources. Significant damage to buildings/structures and crops ("significant harm" as defined in the Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as Personal Protective Clothing, etc). Easily repairable effects of damage to buildings/structures.	The presence of contaminants at such concentrations that protective equipment is required during Site works. The loss of plants in a landscaping scheme.

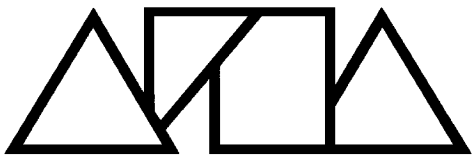
Classification of consequence

Classification	Definition
High Likelihood	There is a pollution linkage and an event which would either appear 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 event 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 event could occur. However, it is by no means certain that even over a longer period such 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

Classification of probability

		CONSEQUENCE			
		Severe	Medium	Mild	Minor
PROBABILITY	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
	Likely	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

Comparison of consequence against probability



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