

Phase 1 Preliminary Risk Assessment Report type

14 May 2021 Date

Client Site address

Muturi 15 Myrtle Close, Erith, Kent, DA8 3PT

Report prepared by Supervised by Mr Louis Turner BSc (Hons) Mr Joseph Turner



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1. Introduction

The following document is a Phase 1 Preliminary Risk Assessment carried out by Oakshire Environmental commissioned by Simon Muturi. It includes a description of the site location and site history as well as the ground composition and environmental setting of the site. This information has been used to develop an initial conceptual site model of potential sources, pathways and receptors of contamination. A brief overview of the proposed development is also included below.

1.1 Project Overview

The client's proposed project involves the construction of a residential dwelling at 15 Myrtle Close, Erith, Kent, DA8 3PT. A Phase 1 Preliminary Risk Assessment has been requested by the client to support a planning application for the proposed project. Oakshire Environmental have carried out a Phase 1 Preliminary Risk Assessment, as described below.

1.2 Purpose of Investigation

The objectives of the Phase 1 Preliminary Risk Assessment were:

- To develop a detailed assessment of the site.
- To assess the potential for contamination at the site.
- To assess the likelihood of unacceptable risks from contamination.
- To assess the need for further investigation or remediation.

1.3 Scope of Work

- To develop a detailed assessment of the site, desk studies have been carried out to collate information on the site's history, ground conditions and environmental setting.
- This information has been used to develop a Conceptual Site Model that identifies potential
 pollutant linkages at the site in order to determine the need for further investigation.
- Report appendix includes photographs and historical and geological maps of the site.
- Desk studies have been carried out by professional Environmental Consultants, with BSc (Hons) in Environmental Science or above, in accordance with the Environment Agency's Land Contamination: Risk Management (LCRM) guidelines as updated from Environment Agency's Model Procedures for the Management of Land Contamination (CLR11) framework.

1.4 Limitations

Quantum Intelligent Trading Ltd, previously and hereafter referred to as Oakshire Environmental. This report has been prepared with reasonable skill, care and diligence following the guidance contained within the Environment Agency's Land Contamination: Risk Management (LCRM) guidelines as updated from Environment Agency's Model Procedures for the Management of Land Contamination (CLR11) framework. This report is only valid when used in its entirety and any information or advice contained within the report should not be relied upon until considered in the context of the whole report. Oakshire Environmental disclaims any responsibility to the client and others in respect of any matters outside the scope of this work. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate. This report is confidential and has been prepared solely for the benefit of the client. Oakshire Environmental accepts no responsibility or liability for the contents of this report being used for any purpose or project for which it was not commissioned. Oakshire Environmental does not accept any liability whatsoever for the consequences of any legislative changes or the release of subsequent guidance documentation and following delivery of the report has no obligation to advise the client or any other party of such changes or their repercussions.

Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions.

2. Site

The following section describes the site using information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located on Myrtle Close to the south of the town of Erith and is approximately 130m². The site currently comprises the garden of the neighbouring property (15 Myrtle Close). There is a grass area at the north separated from the rest of the site by a wooden fence, a small wooden shed just south of the fence, a paved path along the east boundary. There is another area of grass at the west and south of the site with some gravel and soft landscaping separated from the path by a retaining wall. This grass area is ~1m higher than the path and slopes from west to east. There is soft landscaping curtailing the grass area of the site to the north, west and south.

The site is bordered by an area of soft landscaping to the north, the rear gardens of residential dwellings to the west, a pre-school to the south and a residential dwelling to the east. The surrounding area is predominantly residential and there are some commercial premises. There are no woodlands, ancient monuments or archaeological sites within 500m of the site.

National Grid Reference: 551380 176907

2.2 Relevant Planning History

A search of the Local Authority's planning website found the following applications at and near the site.

Table 1: Previous planning applications on and near the site

Application No.	Year	Address	Proposal	Decision	Details
79/02258/OUT	1979	Site Of Former 1 and 3 Myrtle Close And Land At Myrtle Close	Development of land for residential purposes.	Granted with Conditions	Documents unavailable
84/01311/FUL	1984	Junction Of Colyers Lane And Northend Road	erection of 6 three bedroom, 60 two bedroom 32 one bedroom houses with car parking and new access road	Approved	Documents unavailable
12/01379/OUTM	2013	Larner Road Estate, Larner Road	construction of between 550 and 622 residential units	Granted	Groundwater contamination monitoring and remediation strategy conditions applied and subsequent applications show this to have been carried out and validated, however, the reports are not available for review. Validation was carried out at the site, this suggests contamination was identified.
16/01231/FUL	2017	164 - 166 Hurstwood Avenue	Demolition of existing garages and replacement with residential development of 8 residential dwellings	Granted with Conditions	No contamination conditions applied

2.3 Site History

A detailed assessment of historical Ordnance Survey maps and associated data has highlighted the below on-site and off-site, current and historical land uses.

Table 2: Description of the site and surrounding area over time, according to historical maps

Year	Site Description	Surrounding Area				
		Buildings 10m and 50m east (most likely agricultural)				
	No development on the cite	Additional agricultural buildings 90m south west and 80m south east				
1865	No development on the site	Wooded area 20m north				
	Site forms part of the curtilage of an adjacent building	Nursery 260m north east				
		Small collection of buildings 260m south east including a public house and some residential dwellings				
		Large clay pit on-site and to the north east with associated engine house 200m north east				
1909		Orchards bordering the site to the west and 50m south				
		Farms 40m east and 90m south west				
		Another smaller clay pit 90m south east with an engine house 130m south east				
		Collection of buildings to the south east appear to be predominantly residential dwellings				
		Residential development 200m north east bordering the clay pit to the north				
	Site is at the edge of a large clay pit	Two buildings within clay pit 180m east and the engine house in the clay pit to the north is no longer shown				
		School 200m east				
		Further residential development to the north east				
1933		More buildings within clay pit 170m east and the engine house in the clay pit to the south is also no longer shown				
1020		Additional buildings/extensions constructed in clay pit 100m east				
1939		Allotment gardens 190m north east				
		Residential dwellings to the west and east and a clinic to the south				
1958		Row of small attached buildings to the north (most likely storage garages)				
1958 - 1961	Site forms part of the gardens of two residential dwellings and cuttings for clay pit no longer shown	Depot 120m east and a garage 190m north east				
		Large residential development to the west and south replacing old orchards				
		Additional garage to the north				
1969		Depot to the east now labelled as a trading estate				
1972		Long row of storage garages 100m south				
1981		Row of terraced houses adjacent to the site to the east				
1985		Residential development including storage garages to the north on old clay pit (the site itself				
. 300	Site forms part of the garden of a bordering end	forms part of this development)				
1990 -	-terrace residential dwelling	Residential development including storage garages to the south on old clay pit				
1992						
2003		No change				

3. Environmental Setting

The following section provides information on the environmental setting of the site based on data from the British Geological Survey (BGS), the Department for Environment, Food and Rural Affairs (DEFRA), the Coal Authority and Public Health England (PHE).

Table 3: Summary of the site's environmental setting

Environmental Facto	or		Details					
			No superficial aquifer underlying the site					
	Aquifer Designation	Superficial	Unproductive 4m east					
		Bedrock	Secondary A					
	Groundwater	Superficial	N/A					
Hydrogeology	Vulnerability	Bedrock	High					
	Course Destrotion 7		Groundwater abstractions 1.45m north west for 'Drinking, Cooking, Sanitary, Washing, (Small Garden)'					
Hydrology	Source Protection Z Abstractions	cones and	No surface water abstractions within 2km of the site					
			Site is not within a Source Protection Zone					
Hydrology	Water Network		No surface water features within 500m of the site					
			Infilled ground (undivided) - Artificial deposits on-site and extending north and east, 88m south, 311m east, 350m south, 393m east and 492m south east					
	Artificial Ground		Made ground (undivided) - Artificial deposit 463m west					
			Worked ground (undivided) - Void 479m north east					
	Superficial Deposits	•	No superficial deposits on-site					
	Oupermoid Deposite	,	Crayford Silt Member - Silty Clay 3m south					
Geology	Bedrock Geology		Thanet Sand Formation - Sand					
5,7	Artificial Ground per	rmeability	Low to Very High (through mixed flow types)					
	Superficial Permeal	oility	Very Low to Low (through mixed flow types) 3m south					
	Bedrock Permeabili	ty	High (through intergranular flow)					
	Borehole Records		Boreholes completed for the residential development to the south in 1974 identified made ground including brick and concrete rubble, glass, slag, ash and organic material to depths of >10m in some areas					
			Groundwater encountered around 5m					
			'Normandy Farm Clay Pit' and 'Normandy Farm Clay Pit (south)' surface mineral workings 124m and 238m south (ceased)					
			'Larner Road Chalk Mine' underground working 259m north (ceased)					
Workings	Mining and Ground	Workings	'Thanet Road Clay Pit' surface mineral working 265m north (ceased) - the site appears to form part of this clay pit					
Workings			'Erith Clay Pit' surface mineral working 293m north (ceased)					
			Additional underground chalk mines, surface clay pits and a brick works >300m					
Radon	PHE UKradon		1-3% probability of being above action level - no protection measures required					
	Historical Landfill		Myrtle Close landfill (Inert, Industrial, Special) bordering the site to the north - completed in 1957					
Waste and Landfill			Colyers Lane landfill (Inert, Industrial, Special) 79m south east - completed in 1967					
	Historical Waste Sit	es	None within 500m of the site					

4. Initial Conceptual Site Model

The following section outlines potential contamination sources, pathways and receptors based on the information gathered in the previous sections to develop an initial conceptual site model.

4.1 Potential Contamination Sources

Historical map data and information obtained from a review of current and historical land uses on and near the site identified the following potential sources of contamination.

Infilled Ground

The site is situated at the edge of an old clay pit that was subsequently filled in between 1933 and 1957. A large residential development was then built on this landfill just after 1979, the site forms part of this development. Prior to this development the site formed part of the rear gardens of two previous dwellings that were demolished. It should be noted that the site was situated on the edge of this old clay pit and appears to be just south of the landfill boundary. BGS maps of artificial ground do, however, show infilled ground on the site. It is assumed that the residential development would have been subject to some ground investigation work and possibly some remediation, although there is no evidence of this in planning records. Given the age of the development, it is not likely that any potential contamination would have been identified or dealt with to existing standards, however, the time elapsed since this development occurred will also mean that it is unlikely that any volatile contaminants or ground gases will still be present. There has also been a newer residential development further north on the same landfill site that identified some contamination and carried out remediation and validation. This suggests that there is likely to have also been contamination present at the south of the landfill where the site is situated.

There was also another clay pit to the south of the site that was also filled in and built on. This landfill was carried out between 1961 and 1967 and the subsequent residential development was carried out around 1984. Multiple borehole logs completed in 1974 in the area identified made ground to ~15m in some areas that included brick and concrete rubble, glass, slag, ash and organic material. It is, therefore, likely that soil contamination would have been present, however, considering the residential development has since been constructed, this is likely to have been remediated to some degree. The time elapsed since the completion of this landfill suggests that it is unlikely that volatile contaminants or ground gases will be present.

Historical and Existing Industrial Estate

There is an industrial estate to the east of the site that was previously a depot and garage. Some mild contamination of underlying soils is possible from this source from spillages of oils and chemicals or discarded waste but this is likely to be largely mitigated by the presence of hardstanding.

4.2 Potential Contamination Receptors

Given the proposed residential use of the site, the following receptors are considered:

- Residential end users
- Groundwater

4.3 Potential Contamination Pathways

Based on the expected on-site receptors, relevant pathways for the above receptors include:

- Ingestion/inhalation of contaminated soil dust
- Dermal contact with contaminated soil
- Inhalation of soil vapours
- Ingestion of homegrown produce
- Permeation into drinking water pipes
- Ground gas permeation into buildings
- Leaching through soil

Pathways between off-site sources and off-site receptors is beyond the scope of this assessment.

4.4 Risk Assessment Methodology

The potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on the receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

Severities are categorised from Minor to Severe and probabilities are categorised from Unlikely to High Likelihood to give a potential level of risk output.

Table 4: Risk Matrix

Probability		Severity of Consequence						
	Severe	Severe Medium		Minor				
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk				
Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk				
Low Likelihood	ikelihood Moderate Risk		Low Risk	Very Low Risk				
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk				

Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk

Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk

It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild.

Low Risk

It is possible that harm could arise to a designated receptor from an identified source, however, it is likely that this harm, if realised, would normally be mild.

Very Low Risk

There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

4.5 Conceptual Site Model

The information in this section has been compiled to produce an initial conceptual site model outlining the potential sources, pathways and receptors to consider at the site. The level of risk was categorised by considering the severity and probability, as outlined in the previous section.

Table 5: Conceptual site model

Sources	Pathways	Receptors	Severity	Probability	Potential Lev	el of Risk
Infilled Ground	Ingestion/inhalation of contaminated soil dust Dermal contact with contaminated soil Inhalation of soil vapours Ingestion of homegrown produce Permeation into drinking water pipes Ground gas permeation into buildings	Residential end users	Medium	Low Likelihood	Low / Moderate	Potential soil contamination from the bordering landfill site are likely to be mitigated by the development of the site into a part of the gardens of two residential dwellings and its subsequent redevelopment into part of the existing residential development. Volatile contaminants and ground gases are also not likely to be an issue, however, there is still considered to be a residual risk of contamination of underlying soils. The risk to future residents is, therefore, considered to be low to moderate.
	Leaching through soil	Groundwater	Mild	Low Likelihood	Low	Given the time elapsed since the landfill was completed, the presence of mobile contaminants that can leach through soil is unlikely. Any potential groundwater contamination is, therefore, likely to be historical. The risk to groundwater is, therefore, considered to be low.
Historical and Existing Industrial Estate	Ingestion/inhalation of contaminated soil dust Dermal contact with contaminated soil Inhalation of soil vapours Ingestion of homegrown produce Permeation into drinking water pipes	Residential end users	Mild	Low Likelihood	Low	The likelihood of contamination from the nearby industrial estate is low due to the presence of hardstanding and this contamination, if present, would likely be mild. The risk to future residents is, therefore, considered to be low.

5. Conclusions

5.1 Risk Evaluation

The initial conceptual site model identified the following potential pollutant linkages present at the site and the following conclusions have been drawn:

- There is a **low to moderate risk** to residential end users from the ingestion/inhalation of contaminated soil dust, dermal contact with contaminated soil, inhalation of soil vapours, ingestion of homegrown produce, permeation into drinking water pipes and ground gas permeation into buildings from the infilled ground to the north and south of the site.
- There is a **low risk** to groundwater from the leaching of contaminants from the infilled ground to the north and south of the site.
- There is a low risk to residential end users from the ingestion/inhalation of contaminated soil dust, dermal contact with contaminated soil, inhalation of soil vapours in indoor airspace, ingestion of homegrown produce and permeation into drinking water pipes from the industrial estate to the east of the site.

Based on the findings of this Phase 1 Preliminary Risk Assessment, the risk to residential end users is considered to be low to moderate and the risk to groundwater is considered to be low. It can be assumed that the risk to surface water, crops, woodland, archaeological sites and ancient monuments is negligible.

5.2 Further Investigation

Based on the above conclusions, further investigation is recommended in the form of a Phase 2 Intrusive Site Investigation. This should include sampling of shallow soil at the site to be tested for a suite of contaminants including heavy metals and hydrocarbons. This sampling should be targeted towards the proposed garden areas.

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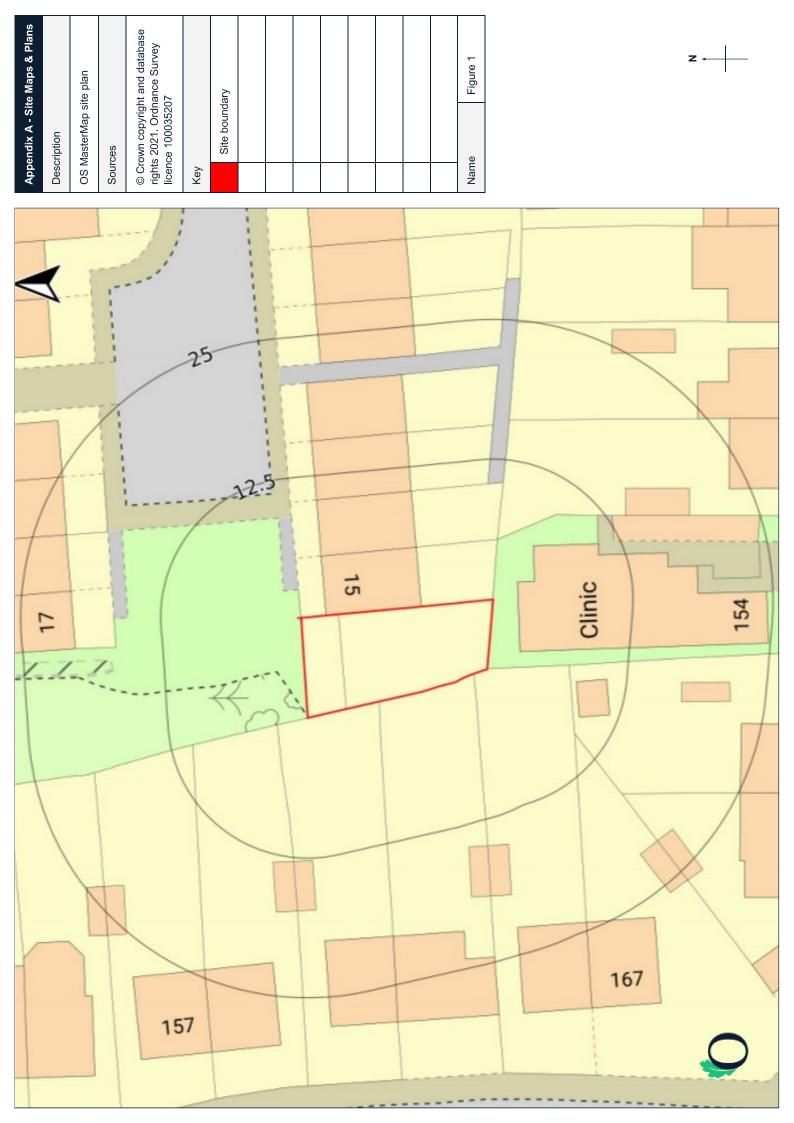
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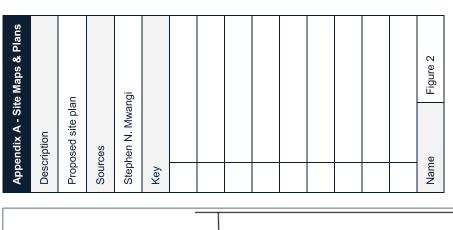
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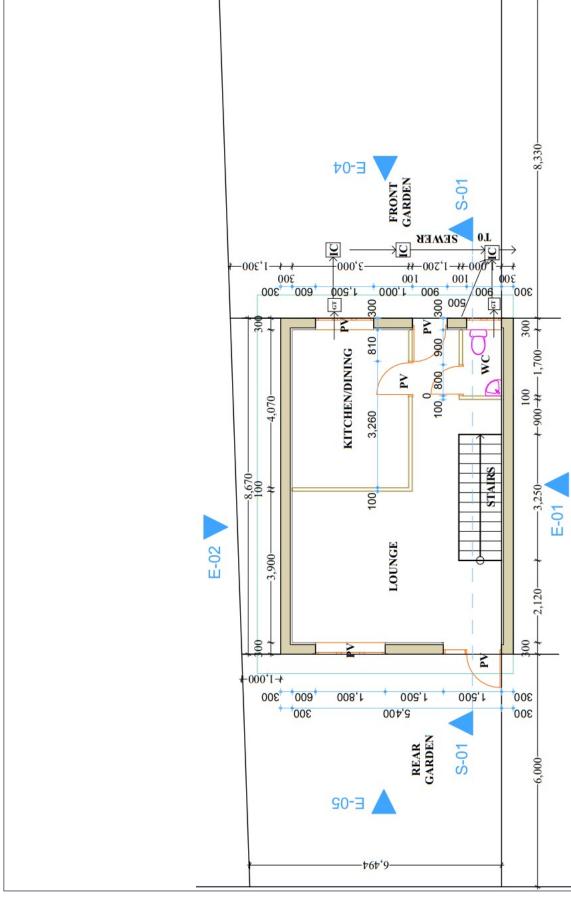
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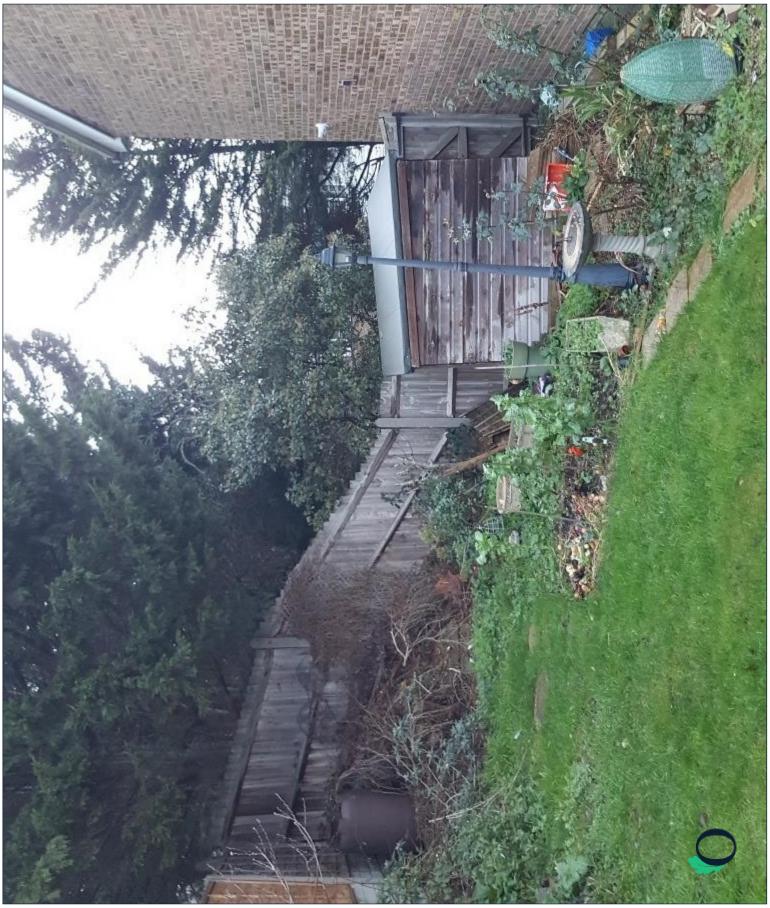




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<u> </u>	Key		
	Name	<u> </u>	Figure 3



Appendix B - Site Photos Description Photo of the grass and soft landscaping with retaining wall facing north Key Key Name Figure 4



Appendix B - Site Photos

Description

Photo of the grass area at the west and south of the site facing west

Sources

Key

Figure 5

Name

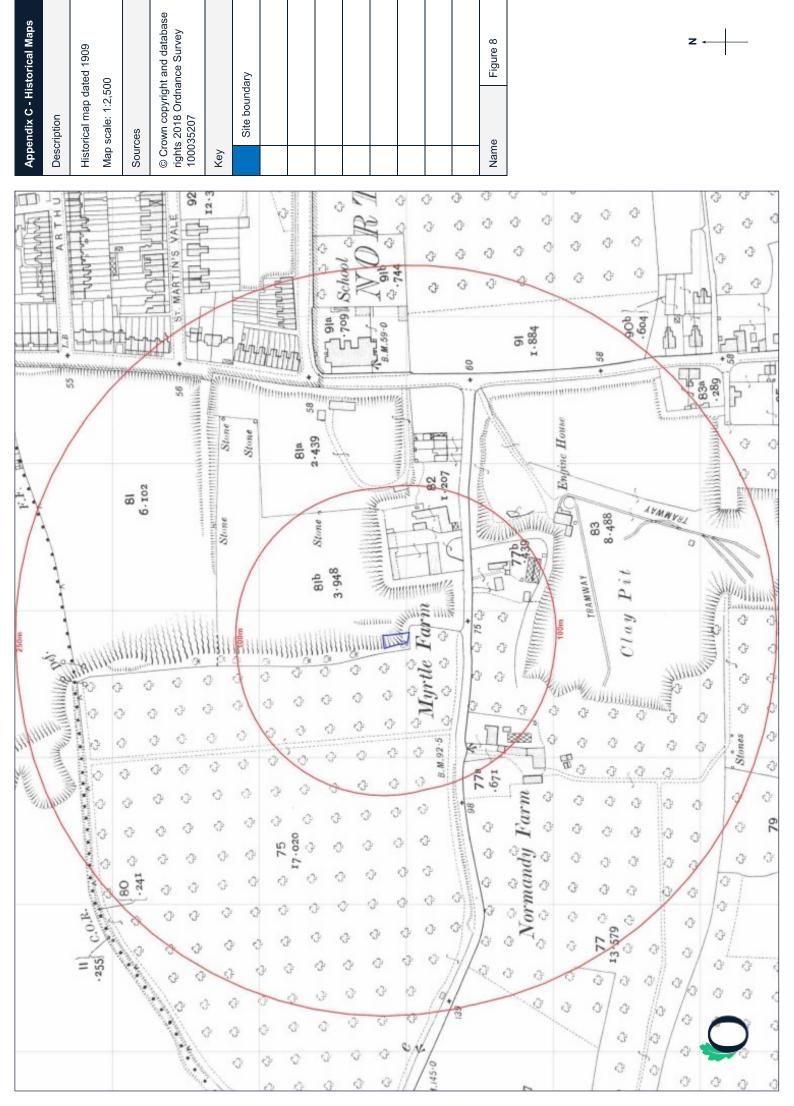
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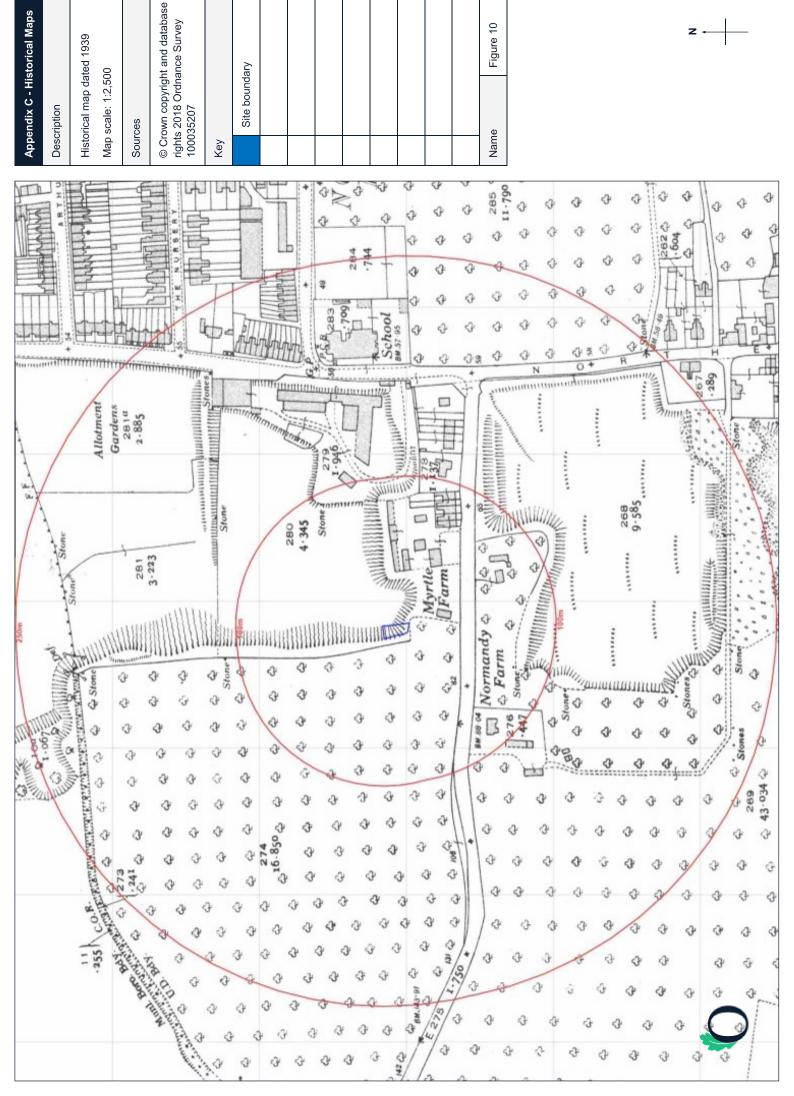
Appendix C - Historical Maps	Description	Historical map dated 1866	Map scale: 1:2,500	Sources	© Crown copyright and database rights 2018 Ordnance Survey 100035207	Key	Site boundary						Name Figure 6
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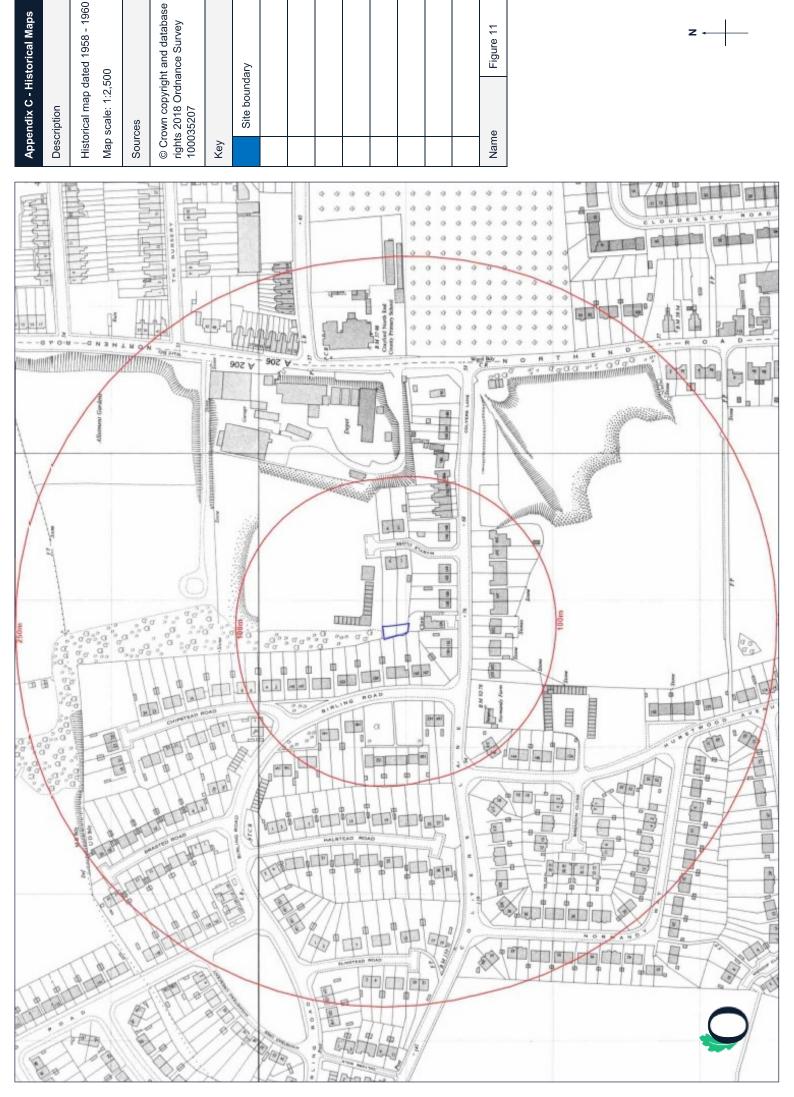
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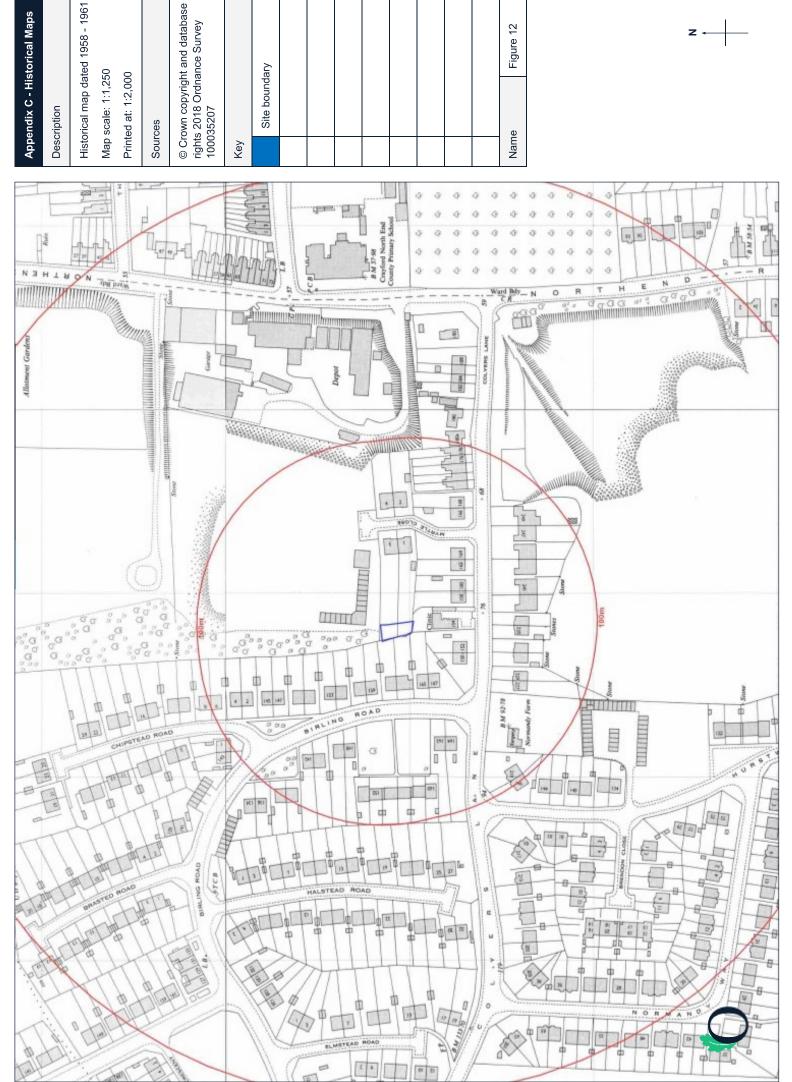
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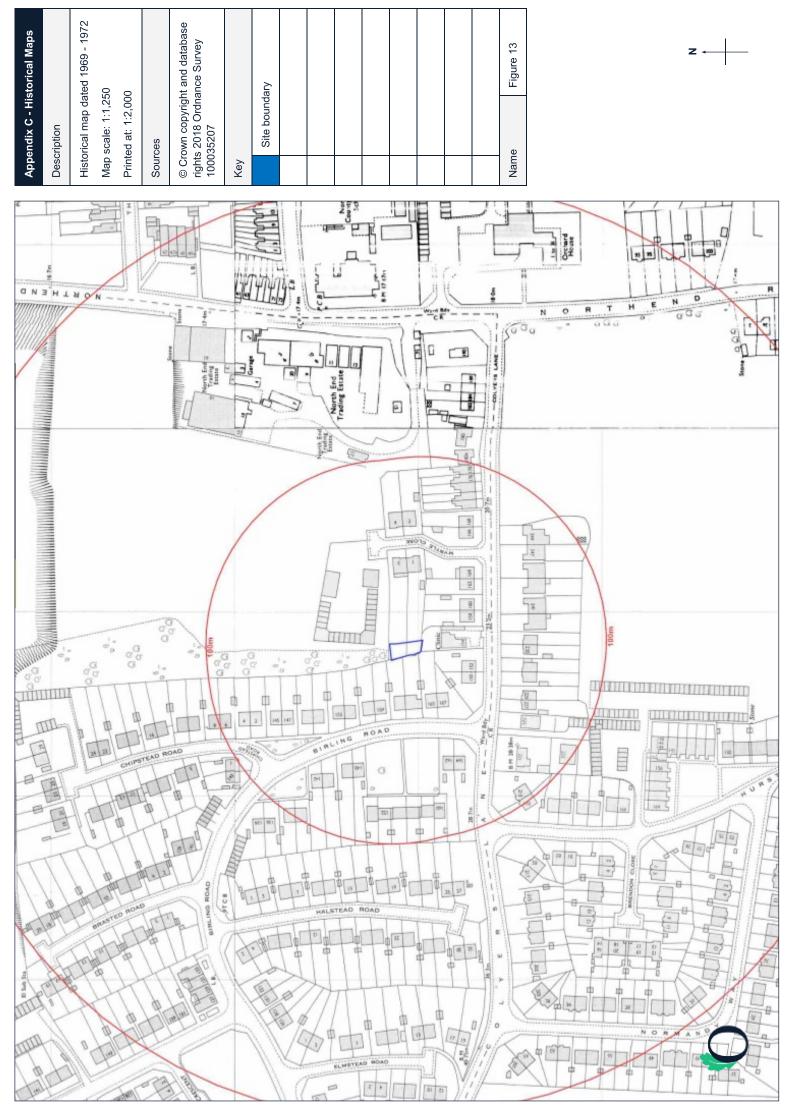








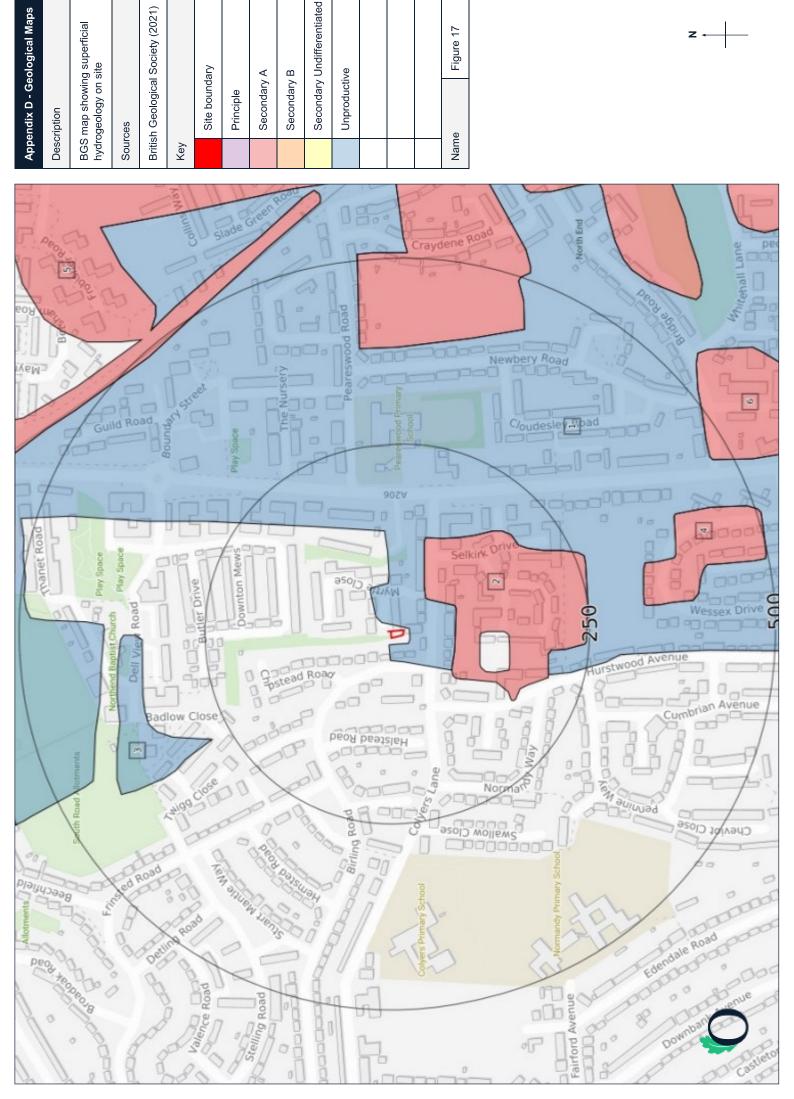


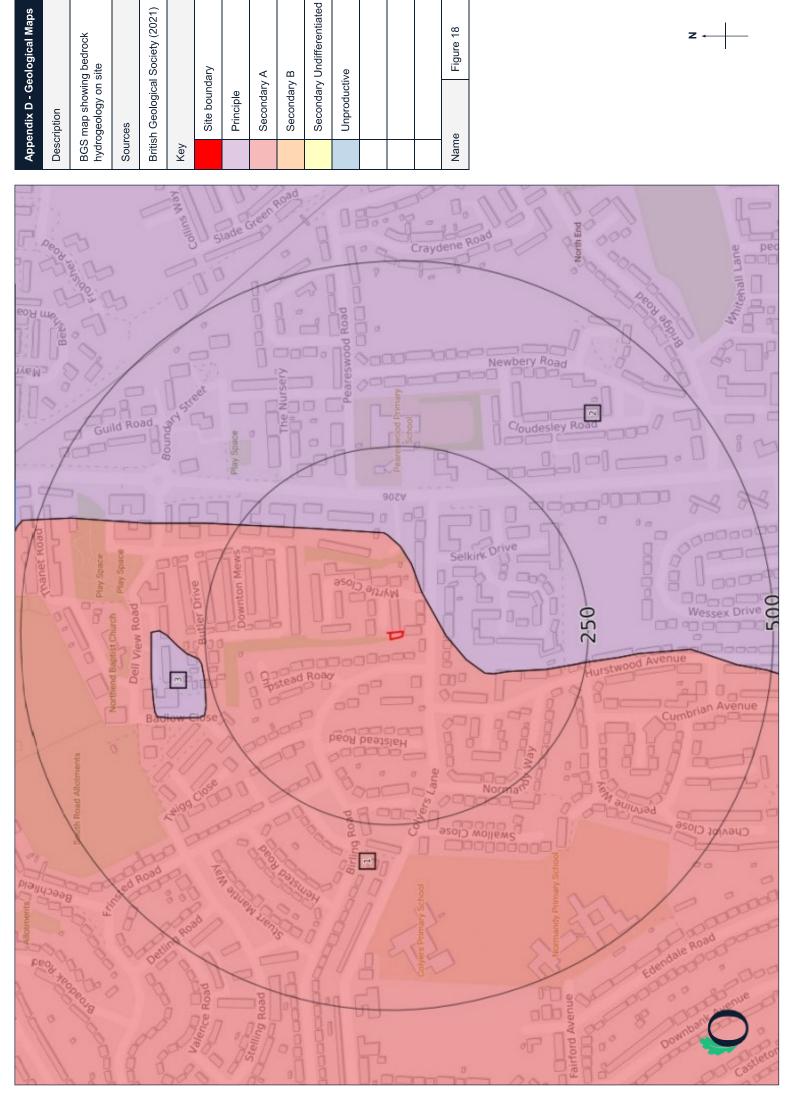


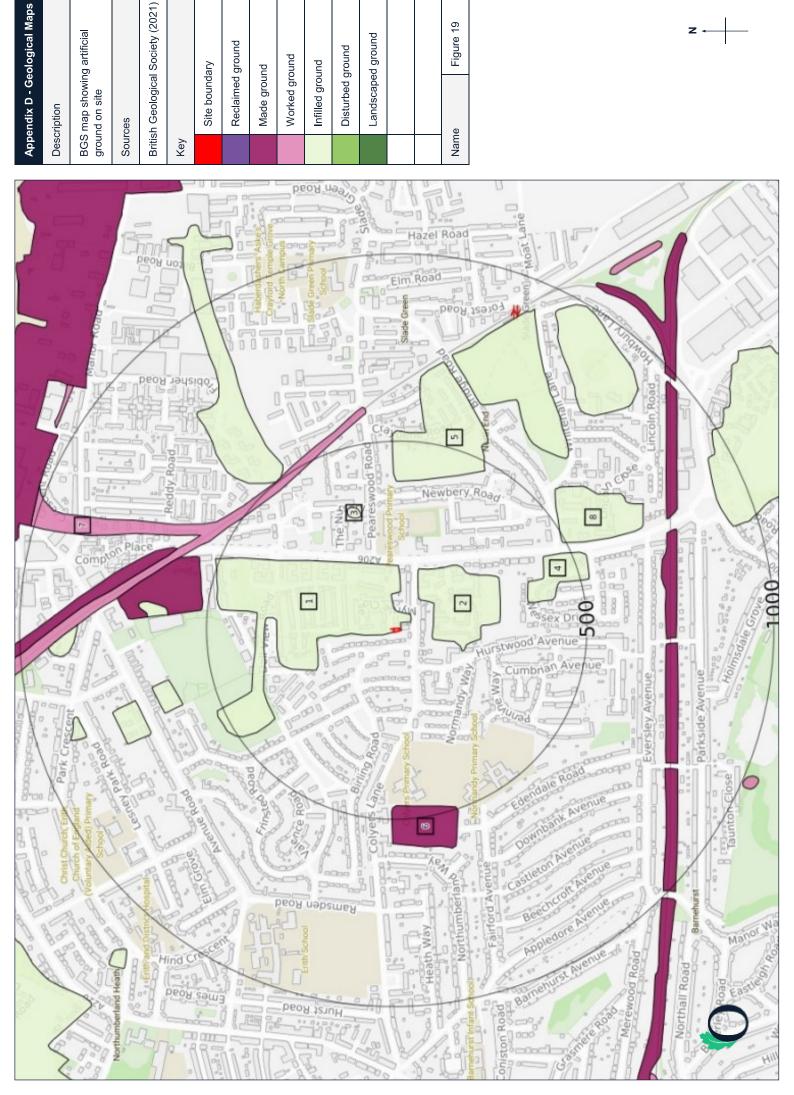














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