

PHASE 1 ENVIRONMENTAL REPORT
of a site at
COBHAM LODGE, VALLEY DRIVE, GRAVESEND,
KENT, DA12 5UE
for
BRELEY DESIGN LIMITED



**Contaminated
Land
Solutions**

t 020 8291 1354 e ask@gosolve.co.uk
4 De Frene Road, London, SE26 4AB

Project No 1532
Report ref: 1532-P1E-1-C
Issued: 06 February 2019
Revision: C

CONTENTS

1 EXECUTIVE SUMMARY

2 BRIEF

3 SITE VISIT

4 SITE LOCATION

5 SITE DESCRIPTION

6 GROUND CONDITIONS

6.1 Geology

6.2 Hydrogeology

6.3 Hydrology

6.4 Ground Stability Hazards

6.5 Mining Activities

6.6 Radon Gas

6.7 Sensitive Land Use

7 SITE HISTORY

8 PROPOSED DEVELOPMENT

9 POTENTIAL CONTAMINATION

9.1 General

9.2 Off Site Contamination

9.3 On Site Contamination

9.4 Preliminary Conceptual Model

10 RISK ASSESSMENT

11 SITE WORK

11.1 Site Preparation

11.2 External Works

12 SITE DEVELOPMENT CONSIDERATIONS

13 CONCLUSIONS

14 REFERENCES

Appendix A – Site Location Plan

Appendix B – Proposed Site Plan

Appendix C – Photographs

Appendix D – Landmark Report Extracts

Appendix E – Historical Maps

Appendix F – Local Authority Information

Appendix G – Contacts

1 EXECUTIVE SUMMARY

Details	Summary	
Proposed Development	Residential with soft landscaping	
Current Site Use	Residential	
Site History	Historical mapping shows that the site has been residential	
Surrounding Area	The nearby surrounding area is residential with woodland to the east	
Environmental Setting	Geology	Superficial: Bedrock: Thanet Formation.
	Hydrogeology	Superficial: N/A
		Bedrock: Secondary A Aquifer Source Protection Zone: SPZ3
Potential Contamination Sources	The site walkover, historical mapping and environmental searches have identified the following potential sources of contamination. • Made Ground (On Site) naturally occurring contaminants • Made Ground electricity substation and engineering services (Off Site) • Imported hardcore & demolition debris (asbestos)	
Risk Assessment Findings	Risk ratings of moderate or greater indicate potentially complete source-pathway-receptor linkages that can require further investigation and remedial measures. The following moderate or greater risks have been identified at the site. • Workers inhaling fibres (asbestos) • Proposed building in direct contact with naturally occurring contaminants.	
Recommendations	Based upon the information currently available, there would in principle, appear to be no significant contamination issues associated with the site. Upgraded water supply pipe may be required by water supply company. It is recommended that this report is provided to the water supplier with a request for the testing, if any, that they require. It is considered that provided the recommendations of this report are implemented there is no increased risk to human health from redevelopment of the site for the proposed use.	

Risk Summary

Very Low	Low	Moderate / Low	Moderate	High
----------	-----	----------------	----------	------

		Receptors					
		Site Users	Ground Workers	Neighbours	Proposed Building	Aquifer	Watercourse
Sources	Made Ground (On-Site)						
	Made Ground (Off-Site)						
	Imported Hardcore & Demolition Debris (asbestos)						

2 BRIEF

Mr Dwight Breley of Breley Design Ltd requested a phase 1 environmental desk top study for a site at Cobham Lodge valley Drive Gravesend Kent DA152 5U on behalf of Ravi Shetra of Milestone Civil Engineering.

The purpose of this report is to assess the risks to sensitive receptors both on and off-site due to soil and groundwater contamination as a result of the proposed development. It is based upon information provided by the client, a site visit and walk over, and a Landmark Envirocheck, historical aerial photographs and maps.

A request for information was sent to the local authority and the response received that the Local Authority does not have any additional information to the information gathered from sources used in this report.

This report is based upon available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

3 SITE VISIT

The site was visited on 14th December. The weather was cold, overcast and dry. Access was available to all areas of the site and a visual inspection was undertaken. A photographic record was made during the visit and this is contained in appendix C.

The client's confidentiality was maintained at all times during discussion with third parties.

4 SITE LOCATION

The site is situated on the southern outskirts of Gravesend and lies north of the junction of the A2 roadway and Valley Drive. Refer to Figure 1.

The National Grid Reference for the approximate site centre is 566230 170520.



Figure 1: Site Location Plan

5 SITE DESCRIPTION

The site is an irregular shape in plan and occupies 0.48ha. The site is fairly flat, except for the central part where the northern side slopes down with an initial steep slope of approximately 1.0m and then a gentle slope to the north boundary of approximately 0.3m.

The site comprises a single residential property with the main two-storey dwelling, of traditional masonry construction, located towards the west end of the site and there is a secondary building, again two-storey, towards the east end of the site. The main dwelling has an integral garage, which at the time of the visit was being used for storage of domestic items. The secondary building is used for recreation.



Photograph 1: View of the site from Valley Drive

The perimeter of the garden is enclosed by brick walls and fences. The west boundary is defined by the back of footpath to Valley Drive, on the far side of which is a car park. The south boundary is with the gardens of the adjacent properties, as is the west end and middle of the north boundary. The northeast boundary is undefined and runs through the garden, beyond the garden fence lie woodlands.

To the front of the property, the west end, is a semi-circular drive up to the main property, the greater part of this frontage is paved with some raised beds and a strip of gravel against the north boundary. There were a number of vehicles parked on the frontage at the time of the visit. The area around the main property is paved and there is a wide paved walkway the full length of the south side of the site, with a narrow, raised bed between this and the boundary.

The central portion of the site, other than the walkway is laid to lawn. Towards the east end of the lawn, by the north boundary is a gravelled children's play area.

The area around the eastern building is paved, up to and beyond the northeast boundary. In the southeast corner is a pump and tank to raise groundwater for irrigation of the garden. Just beyond the northeast boundary are two shipping containers and two sheds, it is understood that these contain domestic household and garden items. There were two vans parked by the sheds at the time of the visit. Some builder's materials and equipment were stored on the rooves of and behind the containers.

The surrounding area appears to slope down to the north. The nearby surrounding area is residential with woodland to the east.

No visual or olfactory evidence of contamination was noted during the visit.

6 GROUND CONDITIONS

6.1 Geology

Reference to the geological survey of Great Britain indicates that beneath made ground, the area generally is underlain by bedrock comprising sand described as the Thanet Formation.

6.2 Hydrogeology

The Environment Agency maps show the site to be located over a Secondary A in the bedrock.

Secondary A Aquifers comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The soils overlying the aquifers are Soils of Intermediate Leaching Potential (I1) - Soils which can possibly transmit a wide range of pollutants.

The Environment Agency maps show the site to be located within a source protection zone, SPZ3 of a borehole abstraction point.

The Environment Agency define a zone according to how the groundwater behaves in that area. From this a model of the groundwater environment is developed on which to define the zones.

Groundwater source catchments are divided into three zones:

SPZ1 – Inner protection zone

Defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres.

SPZ2 – Outer protection zone

Defined by a 400 day travel time from a point below the water table. This zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction.

SPZ3 – Source catchment protection zone

Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Source Catchment Protection Zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75 .

6.3 Hydrology

The nearest unnamed surface water feature appears to be a pond approximately 164 metres to the west. This is considered to be too minor to be significantly impacted by the site.

The Environment Agency maps show the site is not located within a flood zone.

The British Geological Society data shows the site lies in an area with limited potential for groundwater flooding to occur.

Copy of extracts from the Landmark report are contained in appendix D.

6.4 Ground Stability Hazards

Some artificial ground, including made ground and worked ground has been identified south of the site by the A2 slip road.

According to data from the British Geological Survey, the ground beneath the site has been identified as having the following potential risks associated with ground stability:

Source	Hazard Potential
Collapsible Ground	Very low
Compressible Ground	Very low
Ground Dissolution	Moderate
Landslide Ground	Very low
Running Sand Ground	Moderate
Shrinking or Swelling Clay Ground	Very low

These risks would be expected to manifest themselves as excessive settlement in the buildings on the site. However, the risks identified are considered unlikely to be of concern to any new buildings, as the foundation design will be based upon geotechnical information obtained from a site-specific intrusive investigation.

6.5 Mining Activities

Reference to the Coal Authority data indicates that the site is not within an area of known coal mining. There is no other known mining in the area.

6.6 Radon Gas

The Landmark Envirocheck Data also advises that the site lies within an area where between 1 and 3% of properties are above the Action Level, however radon is not generally of concern and protective measures are unlikely to be required.

6.7 Sensitive Land Use

Environmentally Sensitive Areas include Nitrate Sensitive Areas, Sites of Special Scientific Interest (SSSI's), Areas of Outstanding Natural Beauty (AONB), National Parks, National Nature Reserves, Special Areas of Conservation, Special Protection Areas and RAMSAR sites.

According to the Landmark Envirocheck Data the site is located within an area of adopted green belt and next to ancient woodland. The site is also within a surface water Nitrate Vulnerable Zone of coastal streams to the River Thames and 47m to the east of a groundwater Nitrate Vulnerable Zone in North Kent.

7 SITE HISTORY

Copies of the Historical Ordnance Survey maps that have been obtained from The Landmark information group are contained in appendix E.

The maps have been reviewed and items of interest and potential sources of contamination, both on the site and within the surrounding area up to 250 metres from the site boundary are noted hereunder.

Site Usage

From	To	Description
1864	1932	The site appears part of a vacant field, with a few trees.
1936	1961	There is a structure on the west side (appears to be residential) and a large rectangular structure in the south central part of the site. The majority of the site to the east of the residential structure appears to be rear garden.
1962	2013	Large structure in the centre has been demolished, residential building in the west is labelled 'Cobham Lodge' and some minor structures are present in the rear garden.
2018	Present	'Cobham Lodge' on the west half remains unchanged. The smaller structures are no longer present. There is a large square structure in the east of the site which goes beyond the boundary.

Surrounding Area

From	To	Name	Direction	Distance (m)
1864	1896	Old Chalk Pit	N	142
1864	1869	Tank	SW	160
1968	Present	Electricity Transformer/Sub-Station	W	46

8 PROPOSED DEVELOPMENT

Plan details for the proposed redevelopment of the site are shown on the Breley Design ltd drawing contained in appendix B.

The drawing shows an apartment complex development comprising a four storey multi-building development with parking facilities, communal soft landscaping and a green roof. Access to the property is gained via a dedicated entrance from Valley Drive to the west.

9 POTENTIAL CONTAMINATION

9.1 General

From observations made during the site visit, initial discussion with the local authority and review of the historical maps and the Landmark information, potential sources of on-site contamination and off-site contamination have been identified.

No significant potential sources of contamination have been identified beyond a 250 metre boundary which are considered likely to have any impact on the site. Where there are similar industries and activities in the same direction, only the nearest has been listed.

Copies of the relevant extracts are contained in appendix D.

The local Environmental Health Officer (EHO) advised that there are some soil sample results from an adjacent site which suggest some made ground may be present on the site. Any further the information held by the local authority would be included in the Landmark information.

Full correspondence is contained in appendix F

The legislative framework for the regulation of contaminated land is embodied in Part IIA of the Environmental Protection Act 1990, implemented in the Contaminated Land (England) Regulations 2000. This legislation allows for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment. The approach adopted by UK contaminated land policy is that of “suitability for use” which implies that the land should be suitable for its current use and made suitable for any proposed future use.

In this preliminary contamination assessment, the site has been modelled using the Source-Pathway-Receptor approach to produce a site specific conceptual model.

- **Source** - substances or potential contaminants which may cause harm
- **Pathway** - a linkage or route between a source and receptor
- **Receptor** - humans, plant life, groundwater etc., which could be harmed by a contaminant

Geological records indicate that the site is underlain by an aquifer in the bedrock and therefore there is a potential for contaminants to be transported both to and from site in the groundwater.

9.2 Off Site Contamination

Description	Direction	Distance (m)
Discharge Consents:		
None identified.	-	-
Local Authority Pollution Prevention & Controls:		
None identified.		
Category 1 and 2 Pollution Incidents to Controlled Waters:		
None identified.		
Prosecutions Relating to Authorised Processes:		
None identified.		
Substantiated Category 1 and 2 Pollution Incidents:		
None identified.		
Control of Major Accident Hazards Sites (COMAH) & Planning Hazardous Substance Consents		
None identified.		
Landfill and Other Waste Sites:		
None identified.		
Historical and Current Land Uses:		
M K S Scaffolding Ltd Alva House, Gravesend, Kent, DA12 5UE Scaffolding & Work Platforms Active	NW	10
Premier Engineering Uk Llp Alva, Valley Drive, Gravesend, Kent, DA12 5UE Engineers - General Inactive	NW	11
Orange Scrap Vehicle Removals 126, Mackenzie Way, Gravesend, Kent, DA12 5TZ Salvage Dealers Inactive	NW	228
Sonic Rail Services 2, Longview, Henhurst Road, Cobham, Gravesend, Kent, DA12 3AN Engineering Services Inactive	NW	230
Artificial Ground and Made Ground:		

Description	Direction	Distance (m)
None identified.	-	-



Figure 2: Potential sources of contamination within 250m of the site

Potentially contaminating commercial activities have been identified in the vicinity. The general topography falls to the north. This is assumed to be the general direction of the hydraulic gradient, therefore sources to the south and within the near vicinity are considered to have the most potential to impact the site. These include an electricity substation and engineering services.

No credible pathways for ground gas have been identified.

Historical maps suggest that the old chalk pit has been infilled since 1869. As such any potentially significant ground gas source on the site would have degraded to a negligible level. Therefore, the risk is from ground gas considered to be low.

Historical maps also suggest that the tank was removed in 1869 and, therefore, is not considered significant.

9.3 On Site Contamination

Description	Direction	Distance (m)
Discharge Consents:		
None identified.	-	-
Local Authority Pollution Prevention & Controls:		
None identified.		
Category 1 and 2 Pollution Incidents to Controlled Waters:		
None identified.		
Prosecutions Relating to Authorised Processes:		
None identified.		
Substantiated Category 1 and 2 Pollution Incidents:		
None identified.		
Control of Major Accident Hazards Sites (COMAH) & Planning Hazardous Substance Consents		
None identified.		
Landfill and Other Waste Sites:		
None identified.		
Historical and Current Land Uses:		
None identified.		
Artificial Ground and Made Ground:		
None identified.	-	-

No olfactory or visual evidence of contamination was noted on site.

Due to the lack of any major development historically it is considered unlikely that there is a significant depth of fill material beneath the site, and therefore there is not considered to be an on-site source of ground gas.

The EHO advised that there was potential for contamination within the made ground. Samples from the adjacent site were compared to the Atkins 2017 ATRISKsoil SSVs for residential without plant uptake where available. These guideline values have been derived using the updated CLEA v1.071 model, previously published Category 4 Screening Levels (C4SLs) by DEFRA and information in the Environment Agency guidance SR2. Where ATRISKsoil SSVs have not been derived, the Category 4 Screening Levels have been used, and for determinands which do not have either of the above, the LQM/CIEH Sutable 4 Use Levels (S4ULs) assessment criteria have been used.

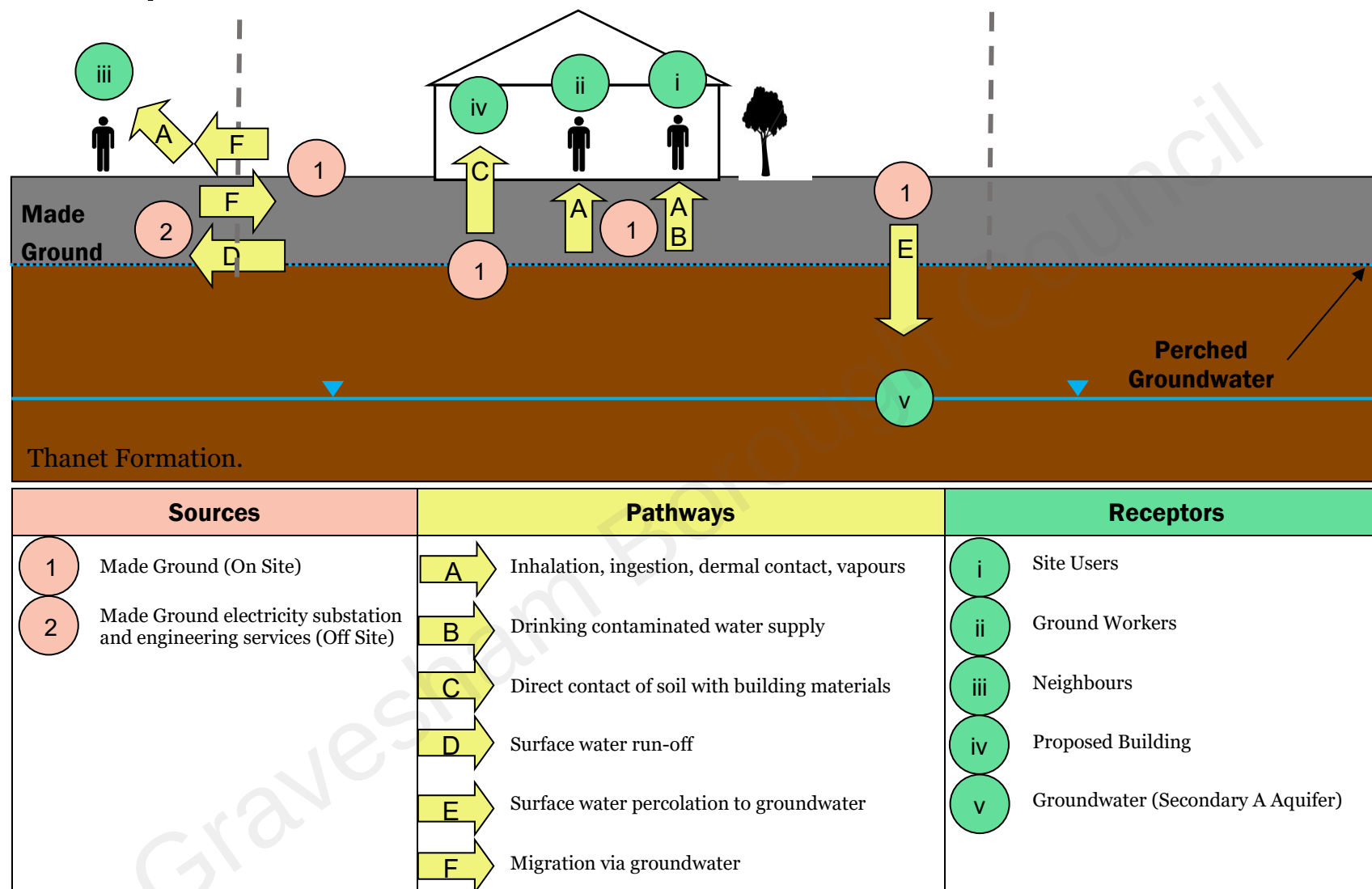
It was determined that there were no exceedances within the samples taken as shown in the table below.

RESIDENTIAL WITHOUT HOMEGROWN PRODUCE (R _{wo} HP) - SOM 1%							
Determinand	Unit	GAC	Source	Concentration		Number of Tests	Number of Exceedences
				Min	Max		
Metals							
Arsenic	mg/kg	39.9	DEFRA C4SL	7.7	8.6	3	0
Cadmium	mg/kg	149.0	DEFRA C4SL	<0.5	<0.5	3	0
Chromium (III)	mg/kg	16700.0	ATRISK SSV	22.0	25	3	0
Copper	mg/kg	9060.0	ATRISK SSV	13.0	24.0	3	0
Lead	mg/kg	313.0	DEFRA C4SL	65.0	220.0	3	0
Mercury (Inorganic)	mg/kg	244.0	ATRISK SSV	<0.25	<0.25	3	0
Nickel	mg/kg	188.0	ATRISK SSV	10	11.0	3	0
Selenium	mg/kg	595.0	ATRISK SSV	<0.3	0.3	3	0
Zinc	mg/kg	47000.0	ATRISK SSV	50.0	160.0	3	0

9.4 Preliminary Conceptual Model

		Potential pathways												
		Inhalation of contaminated vapour	Inhalation of contaminated dust	Direct Soil Ingestion	Direct dermal contact	Inhalation of asbestos	Drinking contaminated water supply	Direct contact of soil with building materials	Surface water run-off	Surface water percolation to groundwater	Migration via groundwater	Build-up of ground gas	Comments on discounted pathways	
Receptors	Site Users	Y	Y	Y	Y	Y	Y					N	No potentially significant sources of land gas identified. This is to be reviewed if significant organic containing material is identified on site.	
	Ground Workers	Y	Y	Y	Y	Y						N		
	Neighbours	Y	Y			Y			Y		Y	N		
	Proposed Building							Y				N		
	Watercourse								N		N		No major watercourse identified nearby.	
	Aquifer									Y				

Schematic Conceptual Model



10 RISK ASSESSMENT

The level of information provided by the Landmark report and historic Ordnance Survey maps, together with the other information within the report is considered suitable to provide the data for a satisfactory risk assessment for the site. While there will always be uncertainties due to known or unknown gaps in information it is considered that sufficient information is available to reduce those uncertainties to within acceptable limits for the nature of the site under review.

An asbestos survey of existing structures and infrastructure (as defined under Section 5(a) of the Control of Asbestos Regulations 2012) was beyond the brief of this report. The risk assessment has been undertaken on the basis that should asbestos be identified within buildings or infrastructure, these materials will be removed appropriately by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition or other works in order to avoid contaminating soils at the site.

Sources	Potential pollutant	Receptor	Pathway	Hazard severity	Likelihood of occurrence	Risk / Significance	Comment & control measures
Made Ground (on site)	Metals Hydrocarbons PAHs	Site Users	Dermal contact	Mild	Low likelihood	Low risk	Any visual or olfactory evidence of contamination noted during the works should be investigated by a suitably qualified person and their recommendations implemented
			Inhalation of vapours, indoors and outdoors	Mild	Low likelihood	Low risk	
			Soil Ingestion and Home Produce Consumption	Mild	Low likelihood	Low risk	
			Inhalation of contaminated dust	Mild	Low likelihood	Low risk	
			Drinking of water from supply impacted by contaminated soil	Mild	Low likelihood	Low risk	Upgraded water supply pipe may be required by water supply company. It is recommended that this report is provided to the water supplier with a request for the testing, if any, that they require.

Sources	Potential pollutant	Receptor	Pathway	Hazard severity	Likelihood of occurrence	Risk / Significance	Comment & control measures
Made Ground (on site)	Metals Hydrocarbons PAHs	Ground Workers	Dermal contact	Mild	Likely	Moderate/Low risk	Information to be contained in site Health & Safety Plan and File. Use of appropriate PPE and normal good hygiene measures. Appropriate dust control measures during construction.
			Inhalation of vapours, indoors and outdoors	Mild	Likely	Moderate/Low risk	
			Soil Ingestion	Mild	Likely	Moderate/Low risk	
			Inhalation of contaminated dust	Mild	Likely	Moderate/Low risk	
Made Ground (on site)	Metals Hydrocarbons PAHs	Neighbours	Inhalation of vapours, indoors and outdoors	Mild	Low likelihood	Low risk	No further action required.
			Inhalation of contaminated dust (during construction)	Mild	Likely	Moderate/Low risk	Appropriate dust control measures during construction.
			Inhalation of contaminated dust (after construction)	Mild	Low likelihood	Low risk	No further action required.

Sources	Potential pollutant	Receptor	Pathway	Hazard severity	Likelihood of occurrence	Risk / Significance	Comment & control measures
Made Ground (on site)	Metals Hydrocarbons PAHs	Aquifer	Vertical percolation to groundwater via Foundations & Drainage	Mild	Low likelihood	Low risk	Foundations and drainage should be designed in such a way that they do not create a pathway for surface water percolation.
			Vertical percolation to groundwater via soft landscaped and permeable areas	Mild	Low likelihood	Low risk	
Demolition debris within the made ground	Asbestos	Site Users	Inhalation	Severe	Unlikely	Moderate/Low risk	No further action required
		Ground Workers		Severe	Low likelihood	Moderate risk	Any debris from earlier demolition found during site strip is to be inspected for asbestos by a suitably experienced contractor. Information to be contained in site Health & Safety Plan and File.
		Neighbours		Severe	Unlikely	Moderate/Low risk	No further action required

Sources	Potential pollutant	Receptor	Pathway	Hazard severity	Likelihood of occurrence	Risk / Significance	Comment & control measures
Electricity sub-station and Engineering Services (off-site)	Metals Hydrocarbons PAHs PCB's	Site Users	Lateral migration of groundwater transporting	Mild	Unlikely	Very low risk	Considered to be too distant and small to constitute a significant risk, no action required
		Ground Workers	contaminants to soil/made ground on site	Mild	Likely	Moderate/Low risk	Information to be contained in site Health & Safety Plan and File. Use of appropriate PPE and normal good hygiene measures.
Naturally occurring contaminants (on-site)	Sulphates pH	Proposed Building	Direct contact of soil with building materials	Medium	Likely	Moderate Risk	As the protection of concrete is normally resolved in the building design process, the designer of the foundations should determine the requirement to undertake any investigation.

Any visual or olfactory evidence of contamination noted during works should be investigated by a suitably qualified person and their recommendations implemented.

11 SITE WORK

11.1 Site Preparation

During the works a watching brief should be maintained by an experienced person. Should any visual or olfactory evidence of contamination be noted during the works GO Contaminated Solution Ltd and the local authority Environmental Health Officer (EHO) should be contacted. GO Contaminated Solution Ltd shall assess if further intrusive investigation and remediation is required. Proposals will be issued to the EHO for comment prior to undertaking the additional investigation or implementing the remediation strategy.

If any potentially contaminated spoil is to be removed from site, the Waste Acceptance Criteria (WAC) testing should be agreed with the facility to which the spoil is being transported. It is recommended that consideration is given to this testing as part of the phase 2 investigation. Guidance can be obtained from Environment Agency document *Waste Sampling and Testing for Disposal to Landfill*.

11.2 External Works

In regard to water supply reference should be made to the UK Water Industry Research (UKWIR) publication *"Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites"* (Ref 10/WM/03/21; the '*UKWIR Guidance*'). This document provides guidance to ensure that water quality is safeguarded by identifying suitable pipe materials and components to be used below ground in potentially contaminated sites. An upgraded water supply pipe may be required by the water supply company. It is recommended that this report is provided to the water supplier with a request for the testing, if any, that they require.

12 SITE DEVELOPMENT CONSIDERATIONS

During the course of the site visit and preparation of this report the following items, whilst not within the scope of this report, have come to our attention and should be considered. This is not necessarily an exhaustive list.

12.1 An intrusive geotechnical investigation may be required to provide detailed information about the engineering nature of the ground, in order to allow the most suitable foundations in terms of economy and performance to be designed. This should follow the recommendations of BS 5930, the Code of Practice for site investigations with tests carried out to satisfy the requirements of BS 1377, the Code of Practice for methods of tests for soils for civil engineering purposes. It is recommended that this includes testing for sulphates.

12.2 As development of the property is proposed it is recommended that a full topographical survey is undertaken, if one is not available. This should identify all relevant features, boundaries and levels relating to the site and should also include ground levels on the adjacent properties and roads.

12.3 If it is proposed to make use of the existing drainage system, or any existing connections to the mains sewers. A CCTV survey should be considered in order to determine both the general condition and suitability for the proposed use.

12.4 If any excavation works are proposed, it is recommended that all the relevant utility companies are contacted to ascertain what pipes, cables, wires, lines and other apparatus exist close to where the work is to take place.

12.5 An asbestos survey of existing structures and infrastructure (as defined under Section 5(a) of the Control of Asbestos Regulations 2012) was beyond the brief of this report. Advice should be sought regarding the potential presence and management of asbestos within existing structures and infrastructure.

13 CONCLUSIONS

Based upon the information currently available, there would in principle, appear to be no significant contamination issues associated with the site. It is considered that provided the recommendations of this report are implemented there is no increased risk to human health from redevelopment of the site for the proposed residential use.

13.1 No source-pathway-receptor linkages have been identified requiring further investigation.

13.2 Should any visual or olfactory evidence of contamination be noted during the works this should be investigated by a suitably qualified person and their recommendations implemented.

13.3 The designer should undertake appropriate geotechnical investigation and take into account the existing ground conditions to ensure foundations are suitably protected.

13.4 Information to be contained in site Health & Safety Plan requiring use of appropriate ppe and normal good hygiene measures, also appropriate dust control measures during construction.

13.5 If any potentially contaminated spoil is to be removed from site, the Waste Acceptance Criteria (WAC) testing should be agreed with the facility to which the spoil is being transported.

13.6 Upgraded water supply pipe may be required by water supply company. It is recommended that this report is provided to the water supplier with a request for the testing, if any, that they require.

14 REFERENCES

- Card, G. B., Wilson, S., & Mortimer, S. (2012). *A Pragmatic Approach to Ground Gas Risk Assessment*. London, UK: Contaminated Land: Applications in Real Environments.
- Department of the Environment, Food and Rural Affairs and Environment Agency. (2004). *CLR 11: Model procedures for the management of land contamination*. Environment Agency. (2013). *Groundwater protection: principles and practice (GP3)*. Bristol: Environment Agency.
- Environment Agency. (2013). *Waste Sampling and Testing for Disposal to Landfill*. Bristol, UK: EA.
- Health and Safety Executive in the United Kingdom. (2012). *The Control of Asbestos Regulations 2012*.
- NHBC and Environment Agency. (2008). *Guidance for the Safe Development of Housing on Land Affected by Contamination*. NHBC and Environment Agency.
- UK Water Industry Research Ltd. (2010). *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites*. UKWIR.
- Wilson, S., Oliver, S., Mallet, H., Hutchings, H., & Card, G. (2007). *CIRIA Report C665. Assessing risks posed by hazardous gases to buildings*. London, UK: Construction Industry Research and Information Association.

*This document has been prepared for the titled project and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and the prior written authority of GO Contaminated Land Solutions Ltd being obtained. No responsibility or liability is accepted for the consequences of this document being used for a purpose other than that for which it was commissioned. Any person using or relying on this document for such other purpose will by such use or reliance be taken to confirm his agreement to indemnify GO Contaminated Land Solutions Ltd for all loss or damage resulting therefrom. GO Contaminated Land Solutions Ltd accepts no responsibility or liability for this document to any party other than **Breley Design ltd** by whom it was commissioned.*



**Contaminated
Land
Solutions**

Appendix A – Site Location Plan

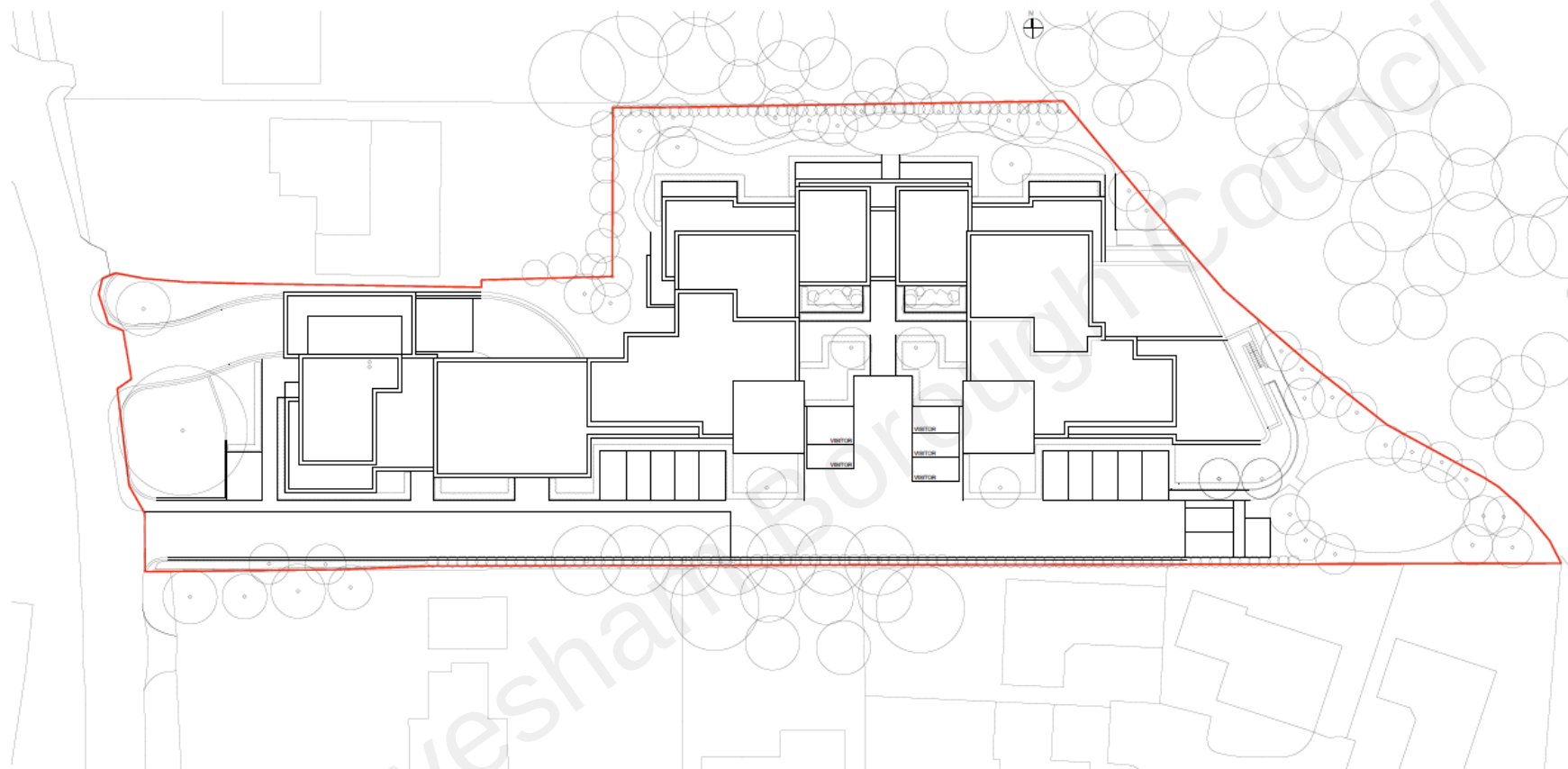




**Contaminated
Land
Solutions**

Appendix B – Proposed Site Plan

Note:
All dimensions to be checked on site before the commencement
of the work.
If this drawing exceeds the quantities in any way the architect
are to be informed before work is commenced.
Do not scale this drawing.
This drawing is copyright.



SITE PLAN 1:200



Valley Drive

SITE PLAN

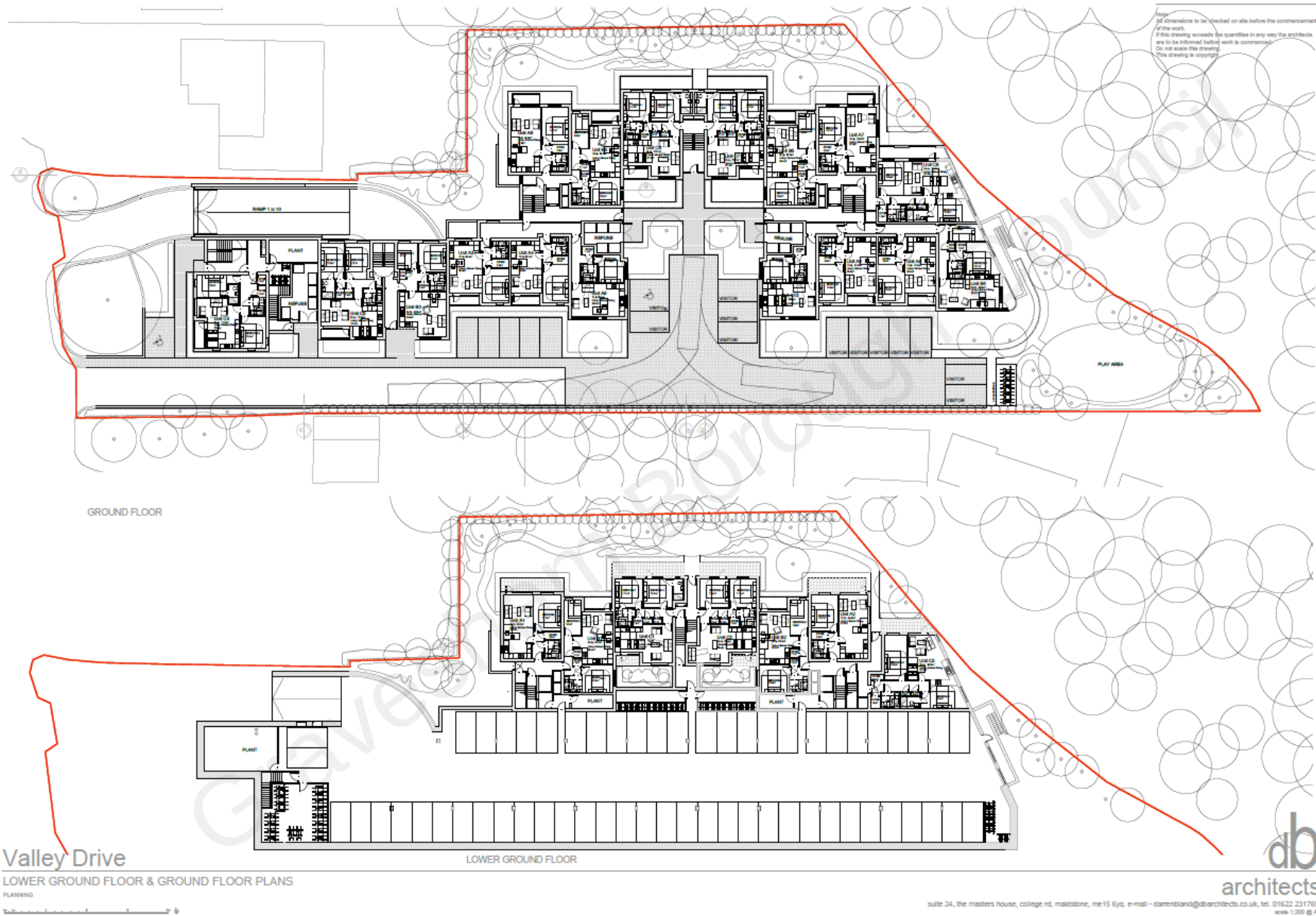
PLANNING



architects

suite 24, the masters house, college road, maidstone, kent, me15 6yq. e-mail - darrenbland@dbarchitects.co.uk, tel. 01622 231 789
scale 1:200@ A1
SHE-0376, drawing 013 REV 1, November 2018

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



**Contaminated
Land
Solutions**

Appendix C – Photographs



View from Valley Drive



View across Site from Southwest Corner



View North and East from Northeast Corner of the Main Dwelling



180° View from South border at east end of lawn



(Cont.) 180° View from South border at east end of lawn



Groundwater Pump in Southeast Corner of Site



**Contaminated
Land
Solutions**

Appendix D – Landmark Report Extracts

Where the overview indicates that no data has been found the relevant detail report sections may have been omitted.

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (N)	0	1	566229 170517
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NW (S)	482	1	566229 170000
1	Discharge Consents Operator: Gravesham Borough Council Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: 3 & 4 Henhurst Hill, Cobham 3 & 4 Henhurst Hill, Henhurst Hill, Cobham, Gravesend, Kent, DA12 3aw Authority: Environment Agency, Southern Region Catchment Area: Darent (NIRS) Reference: P11384 Permit Version: 2 Effective Date: 21st December 2012 Issued Date: 21st December 2012 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Underground Strata Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A8SW (S)	887	2	565980 169650
1	Discharge Consents Operator: Gravesham Borough Council Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: 3 & 4 Henhurst Hill, Cobham 3 & 4 Henhurst Hill, Henhurst Hill, Cobham, Gravesend, Kent, DA12 3aw Authority: Environment Agency, Southern Region Catchment Area: Darent (NIRS) Reference: P11384 Permit Version: 1 Effective Date: 13th March 2003 Issued Date: 13th March 2003 Revocation Date: 20th December 2012 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Underground Strata Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A8SW (S)	887	2	565980 169650
2	Local Authority Pollution Prevention and Controls Name: Cobham Service Station Location: Dover Road (A2), Cobham, GRAVESEND, Kent, DA12 3BH Authority: Gravesham Borough Council, Environmental Health Department Permit Reference: PP1/98/038 Dated: 30th December 1998 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Permitted Positional Accuracy: Manually positioned to the address or location	A9NW (SE)	610	3	566721 170041
2	Local Authority Pollution Prevention and Controls Name: Cobham Service Station Location: A2 Motorway, GRAVESEND, Kent, DA12 3BH Authority: Gravesham Borough Council, Environmental Health Department Permit Reference: PP1/98/041 Dated: 30th December 1998 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Authorised Positional Accuracy: Automatically positioned to the address	A9NW (SE)	625	3	566715 170015
3	Local Authority Pollution Prevention and Controls Name: Singlewell Service Centre Location: Havercourt Road, Singlewell, DA12 5uq Authority: Gravesham Borough Council, Environmental Health Department Permit Reference: PP1/10/066 Dated: 25th March 2010 Process Type: Local Authority Pollution Prevention and Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input Status: Permitted Positional Accuracy: Manually positioned to the address or location	A12NW (W)	825	3	565365 170714
	Nearest Surface Water Feature	A13NW (W)	164	-	565996 170525

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	Pollution Incidents to Controlled Waters Property Type: Industrial: Other Location: Cobham (Koc Own Land) Authority: Environment Agency, Southern Region Pollutant: Rubble/Litter Or Solids Note: Flytipping At Car Park; Nells Cafe Incident Date: 27th April 1998 Incident Reference: 197171W Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Miscellaneous/Other Pollution Type Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NW (W)	665	2	565500 170600
5	Water Abstractions Operator: Amec Plc Licence Number: 01/143 Permit Version: 1 Location: Borehole At Point A At Scalers Hill Cobham Near Gravesend Authority: Environment Agency, Southern Region Abstraction: Construction: Dust Suppression Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On The Map Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 7th September 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	795	2	566740 169820
	Groundwater Vulnerability Soil Classification: Soils of Intermediate Leaching Potential (I1) - Soils which can possibly transmit a wide range of pollutants Map Sheet: Sheet 40 Thames Estuary Scale: 1:100,000	A13SE (S)	0	2	566239 170479
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 40 Thames Estuary Scale: 1:100,000	A13SW (N)	0	2	566229 170517
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SW (N)	0	4	566229 170517
	Superficial Aquifer Designations No Data Available				
6	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A13SW (N)	0	2	566229 170517
7	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A17NE (NW)	909	2	565660 171306
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefitting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Gravesham Borough Council - Has no landfill data to supply		0	6	566229 170517
	Local Authority Landfill Coverage Name: Kent County Council - Had landfill data but passed it to the relevant environment agency		0	7	566229 170517
15	Potentially Infilled Land (Non-Water) Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1962	A17SE (NW)	524	10	565752 170672
16	Potentially Infilled Land (Non-Water) Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1962	A9NW (SE)	551	10	566644 170039

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thanet Sand Formation	A13SW (N)	0	1	566229 170517
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	0	1	566229 170500
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (N)	0	1	566229 170517
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil and Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (W)	227	1	565936 170551
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil and Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (SW)	227	1	566000 170355
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (W)	248	1	565942 170400
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (W)	264	1	565897 170500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Natural Cavities Easting: 566000 Northing: 170600 Distance: 171 Quadrant Reference: A13 Quadrant Reference: NW Bearing Ref: W Cavity Type: Solution Pipe Solid Geology Detail: Chalk Group, Thanet Sand Formation Superficial Geology: No Details Detail:	A13NW (W)	171	8	566000 170600
	Natural Cavities Easting: 565300 Northing: 170100 Distance: 957 Quadrant Reference: A7 Quadrant Reference: NW Bearing Ref: SW Cavity Type: Solution Pipe Solid Geology Detail: Chalk Group, Thanet Sand Formation Superficial Geology: Clay with flints Detail:	A7NW (SW)	957	8	565300 170100
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	35	1	566134 170568
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	160	1	566002 170548
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	126	1	566295 170664
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	211	1	566336 170739
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	217	1	566348 170740
	Potential for Ground Dissolution Stability Hazards Hazard Potential: High Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	217	1	566369 170729
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	231	1	565965 170396
	Potential for Ground Dissolution Stability Hazards Hazard Potential: High Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	248	1	565942 170400
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	250	1	566375 170764
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	126	1	566295 170664

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	222	1	566097 170303
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	250	1	566375 170764
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	35	1	566134 170568
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	126	1	566295 170664
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	160	1	566002 170548
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	195	1	565973 170465
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	222	1	566097 170303
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	250	1	566375 170764
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	217	1	566348 170740
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	250	1	566375 170764
	Radon Potential - Radon Affected Areas Affected Area: The property is in an intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	566229 170517

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	Contemporary Trade Directory Entries Name: M K S Scaffolding Ltd Location: Alva House, Gravesend, Kent, DA12 5UE Classification: Scaffolding & Work Platforms Status: Active Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	10	-	566189 170552
20	Contemporary Trade Directory Entries Name: Premier Engineering Uk Llp Location: Alva, Valley Drive, Gravesend, Kent, DA12 5UE Classification: Engineers - General Status: Inactive Positional Accuracy: Automatically positioned to the address	A13NW (NW)	11	-	566190 170552
21	Contemporary Trade Directory Entries Name: Orange Scrap Vehicle Removals Location: 126, Mackenzie Way, Gravesend, Kent, DA12 5TZ Classification: Salvage Dealers Status: Inactive Positional Accuracy: Automatically positioned to the address	A13NW (NW)	228	-	565976 170678
22	Contemporary Trade Directory Entries Name: Sonic Rail Services Location: 2, Longview, Henhurst Road, Cobham, Gravesend, Kent, DA12 3AN Classification: Engineering Services Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (S)	229	-	566158 170283
23	Contemporary Trade Directory Entries Name: L O C Printing Solutions Location: 8, Virginia Walk, Gravesend, DA12 5UL Classification: Printers Status: Active Positional Accuracy: Automatically positioned to the address	A13NW (NW)	306	-	565991 170802
24	Contemporary Trade Directory Entries Name: On Top Pest Control Location: 69, Mackenzie Way, Gravesend, Kent, DA12 5UH Classification: Pest & Vermin Control Status: Active Positional Accuracy: Automatically positioned to the address	A13NW (NW)	307	-	565939 170759
25	Contemporary Trade Directory Entries Name: Pressing Problems Location: 59, Ifield Way, GRAVESEND, Kent, DA12 5UA Classification: Cleaning Services - Domestic Status: Inactive Positional Accuracy: Automatically positioned to the address	A18SW (NW)	427	-	565983 170936
26	Contemporary Trade Directory Entries Name: Chips Away Location: 32, Calderwood, Gravesend, Kent, DA12 4QH Classification: Car Breakdown & Recovery Services Status: Inactive Positional Accuracy: Automatically positioned to the address	A18SE (N)	508	-	566322 171050
27	Contemporary Trade Directory Entries Name: Fast Press Location: 5, The Hollies, Gravesend, DA12 5EP Classification: Ironing & Home Laundry Services Status: Active Positional Accuracy: Automatically positioned to the address	A12NE (W)	548	-	565646 170729
28	Contemporary Trade Directory Entries Name: Esso Location: A2 Trunk Road, Cobham, Gravesend, Kent, DA12 3BH Classification: Petrol Filling Stations Status: Active Positional Accuracy: Manually positioned to the address or location	A9NW (SE)	599	-	566693 170031
28	Contemporary Trade Directory Entries Name: M R H Service Station Location: Cobham Service Station South, Watling Street, Gravesend, DA12 3BH Classification: Petrol Filling Stations Status: Active Positional Accuracy: Automatically positioned to the address	A9NW (SE)	599	-	566693 170031
28	Contemporary Trade Directory Entries Name: Cobham Service Station Location: Cobham Service Station South, Watling Street, Gravesend, DA12 3BH Classification: Petrol Filling Stations - 24 Hour Status: Inactive Positional Accuracy: Automatically positioned to the address	A9NW (SE)	599	-	566693 170031

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
47	Points of Interest - Commercial Services Name: Orange Scrap Vehicle Removals Location: 126 Mackenzie Way, Gravesend, DA12 5TZ Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A13NW (NW)	228	9	565976 170678
48	Points of Interest - Commercial Services Name: On Top Pest Control Location: 69 Mackenzie Way, Gravesend, DA12 5UH Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A13NW (NW)	307	9	565939 170758
49	Points of Interest - Commercial Services Name: All Cars Wanted Location: 39 Livingstone Road, Gravesend, DA12 5DW Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A17NE (NW)	781	9	565782 171230
49	Points of Interest - Commercial Services Name: M25 Car Breakers Location: 39 Livingstone Road, Gravesend, DA12 5DW Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A17NE (NW)	781	9	565782 171230
50	Points of Interest - Commercial Services Name: Singiewell Service Centre Location: Hever Court Road, Gravesend, DA12 5UQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NW (W)	826	9	565354 170715
51	Points of Interest - Commercial Services Name: G & S Location: 11 Sirdar Strand, Gravesend, DA12 4LP Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A19NW (NE)	974	9	566858 171311
51	Points of Interest - Commercial Services Name: G & S Location: 11 Sirdar Strand, Gravesend, DA12 4LP Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A19NW (NE)	974	9	566858 171311
52	Points of Interest - Manufacturing and Production Name: Tank Location: DA12 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (NW)	464	9	565782 170812
53	Points of Interest - Manufacturing and Production Name: Ideal Poultry Farm Location: DA12 Category: Farming Class Code: Poultry Farming, Equipment and Supplies Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	928	9	567161 170828
54	Points of Interest - Public Infrastructure Name: Cobham London Rd Location: Cobham Service Station South, Watling Street, Cobham, Gravesend, Kent, DA12 3BH Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A9NW (SE)	507	9	566698 170169
55	Points of Interest - Public Infrastructure Name: Cobham A2 London Road Location: Watling Street, Cobham, Gravesend, DA12 3BH Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A9NW (SE)	593	9	566704 170048
55	Points of Interest - Public Infrastructure Name: Esso Location: A2 Motorway, Cobham, Gravesend, DA12 3BH Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A9NW (SE)	599	9	566693 170031

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
55	Points of Interest - Public Infrastructure Name: M R H Service Station Location: Watling Street, Cobham, Gravesend, DA12 3BH Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A9NW (SE)	599	9	566693 170031
55	Points of Interest - Public Infrastructure Name: Cobham Service Station (Esso) Location: Watling Street, Cobham, Gravesend, Kent, DA12 3BH Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A9NW (SE)	621	9	566714 170020
56	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13NW (NW)	377	9	565908 170826
56	Points of Interest - Recreational and Environmental Name: Playground Location: Mackenzie Way, DA12 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13NW (NW)	377	9	565908 170826
57	Points of Interest - Recreational and Environmental Name: Playground Location: Wilberforce Way, DA12 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	872	9	565430 171021
58	Gas Pipelines Name: FM05 - Shorne to Farningham (A2 Diversion) Nat Grid: Owned By National Grid Diameter (mm): 750 Building Proximity: 62 Distance (m): Status: Active Pipe Length (m): 1881.7 Pipe Number: Feeder 5	A13SE (SE)	170	10	566367 170327
59	Gas Pipelines Name: FM05 - Shorne to Farningham Nat Grid: Owned By National Grid Diameter (mm): 750 Building Proximity: 62 Distance (m): Status: Active Pipe Length (m): 3683.5 Pipe Number: Feeder 5	A13SE (SE)	211	10	566492 170397
60	Gas Pipelines Name: FM05 - Shorne to Farningham (Abandoned) Nat Grid: Owned By National Grid Diameter (mm): Not Supplied Building Proximity: Not Supplied Distance (m): Status: Abandoned Pipe Length (m): 1658.8 Pipe Number: Feeder 5	A13SW (SW)	245	10	566101 170250
61	Gas Pipelines Name: FM18 - Shorne to Farningham Nat Grid: Owned By National Grid Diameter (mm): 750 Building Proximity: 62 Distance (m): Status: Active Pipe Length (m): 15494.3 Pipe Number: Feeder 18	A13SE (SE)	267	10	566496 170301

Sensitive Land Use

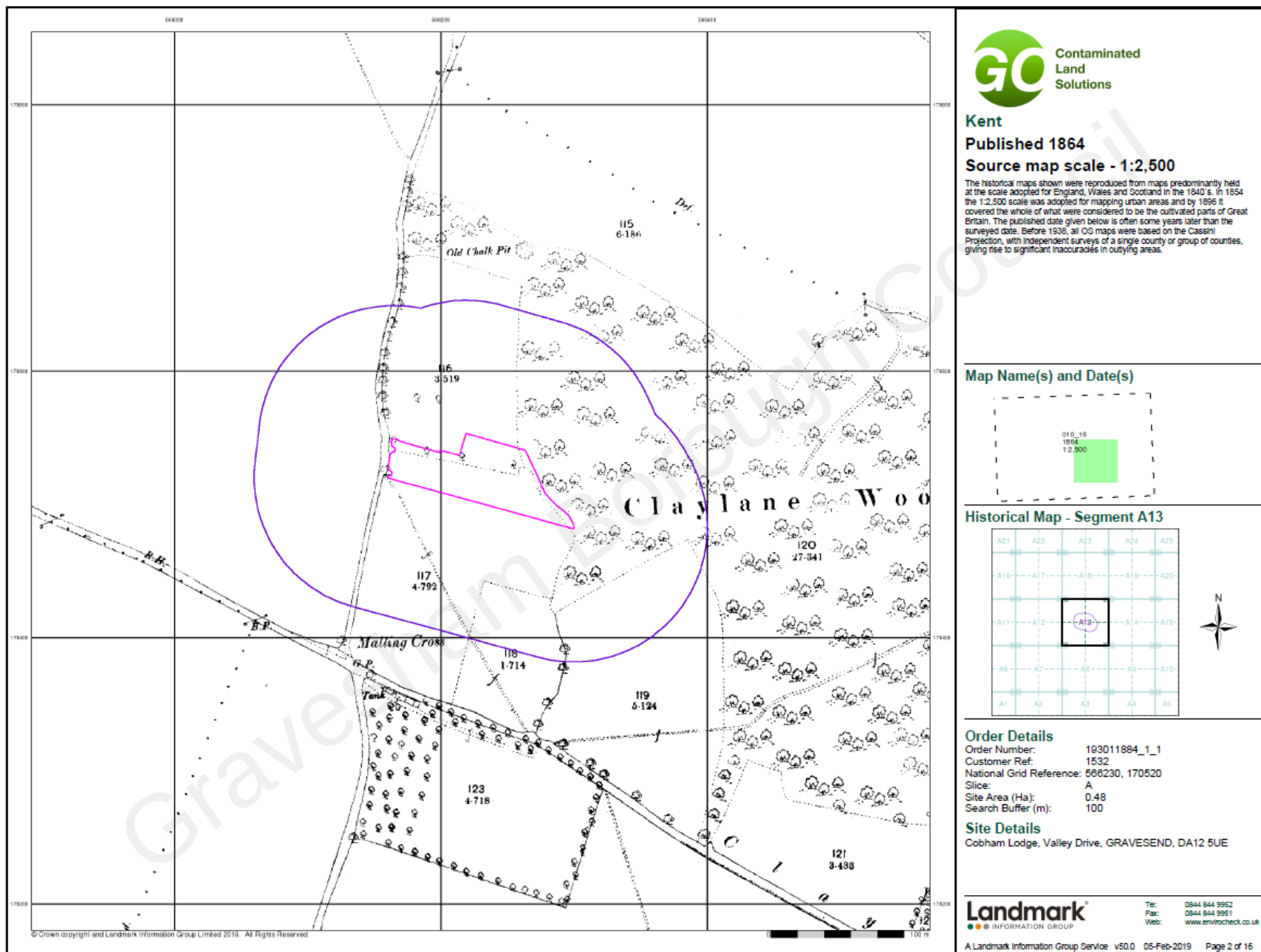
Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
62	Ancient Woodland Name: Claylane Wood Reference: 1486684 Area(m²): 102067.7 Type: Ancient and Semi-Natural Woodland	A13NE (NE)	0	11	566267 170533
63	Areas of Adopted Green Belt Authority: Gravesham Borough Council Plan Name: Gravesham Local Plan - Core Strategy Status: Adopted Plan Date: 30th September 2014	A13NE (NE)	0	12	566266 170534
64	Nitrate Vulnerable Zones Name: Coastal Streams To Lower Thames Nvz Description: Surface Water Source: Environment Agency, Head Office	A13NE (NE)	0	4	566267 170533
65	Nitrate Vulnerable Zones Name: North Kent Description: Groundwater Source: Environment Agency, Head Office	A13SE (SE)	50	4	566301 170414



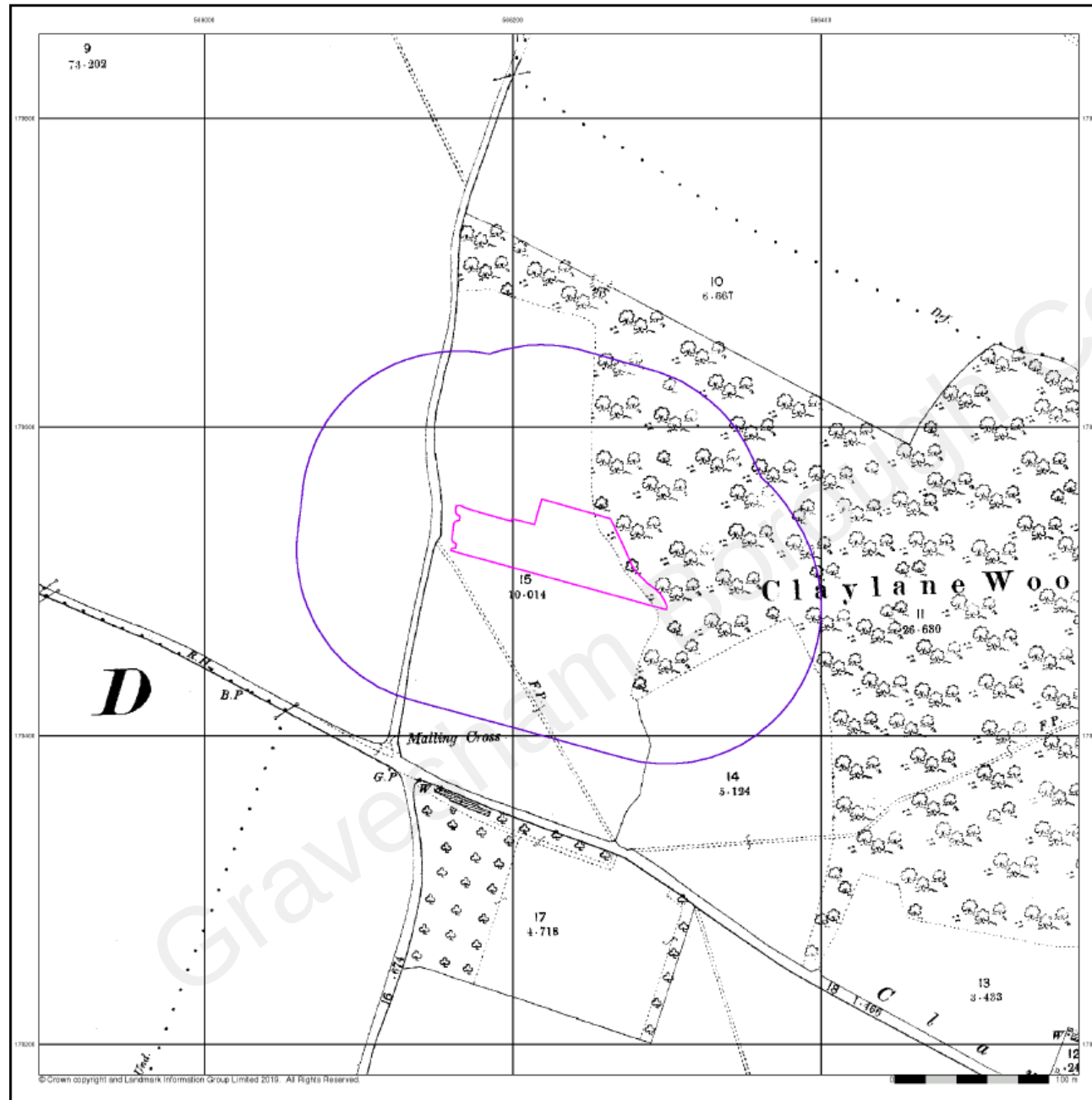
**Contaminated
Land
Solutions**

Appendix E – Historical Maps

© Crown copyright. All rights reserved. Licence number LAN1001467.



1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



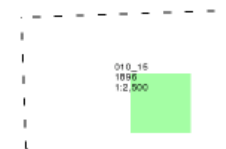
Kent

Published 1896

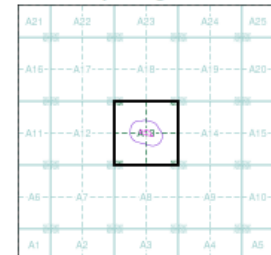
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 193011884_1_1
Customer Ref: 1532
National Grid Reference: 556230, 170520
Slice: A
Site Area (Ha): 0.48
Search Buffer (m): 100

Site Details

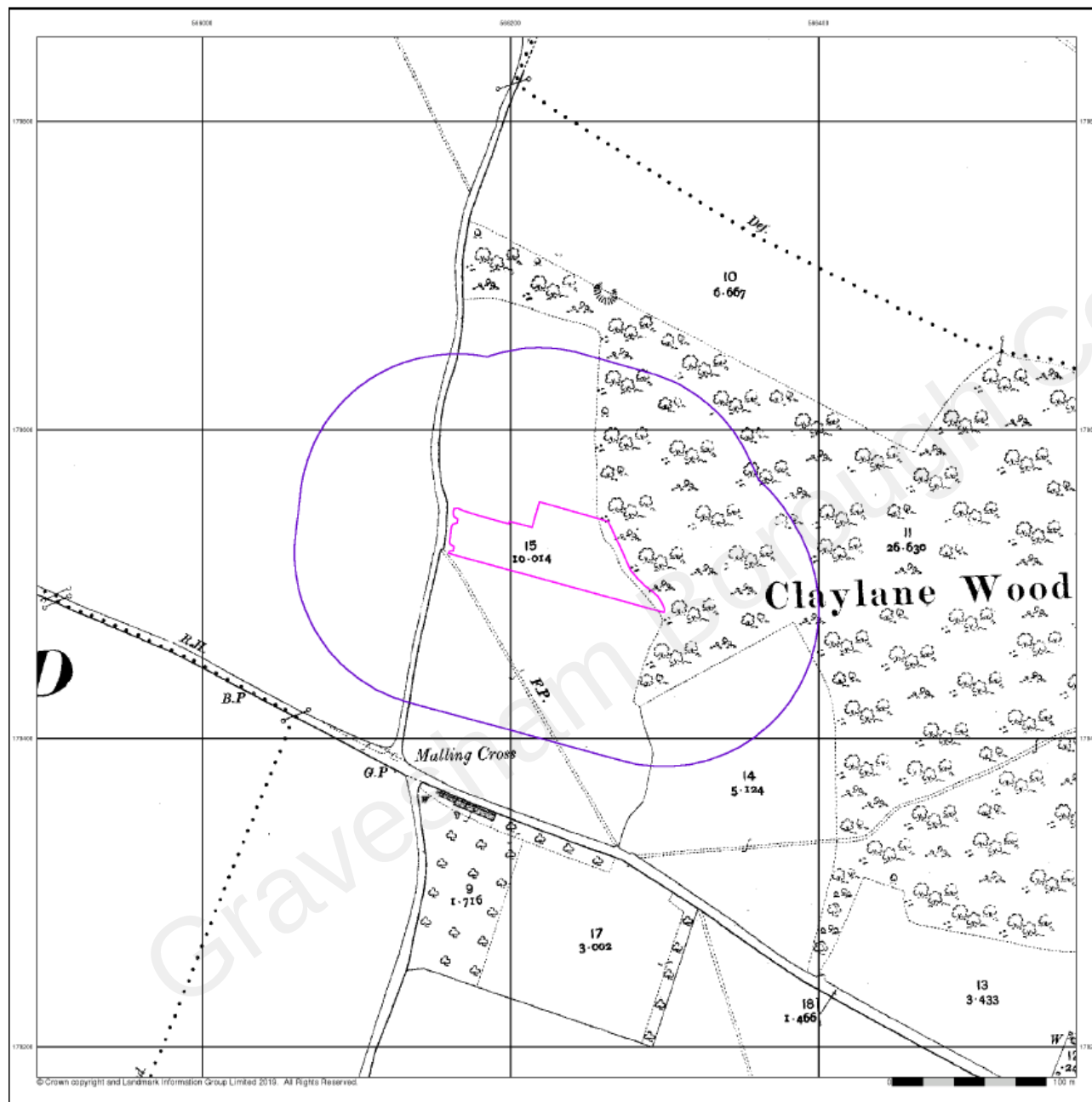
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v50.0 05-Feb-2019 Page 3 of 16

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



Contaminated
Land
Solutions

Kent

Published 1908

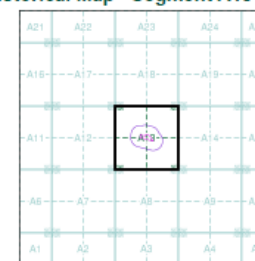
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1935, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 193011884_1_1
Customer Ref: 1532
National Grid Reference: 566230, 170520
Slice: A
Site Area (Ha): 0.48
Search Buffer (m): 100

Site Details

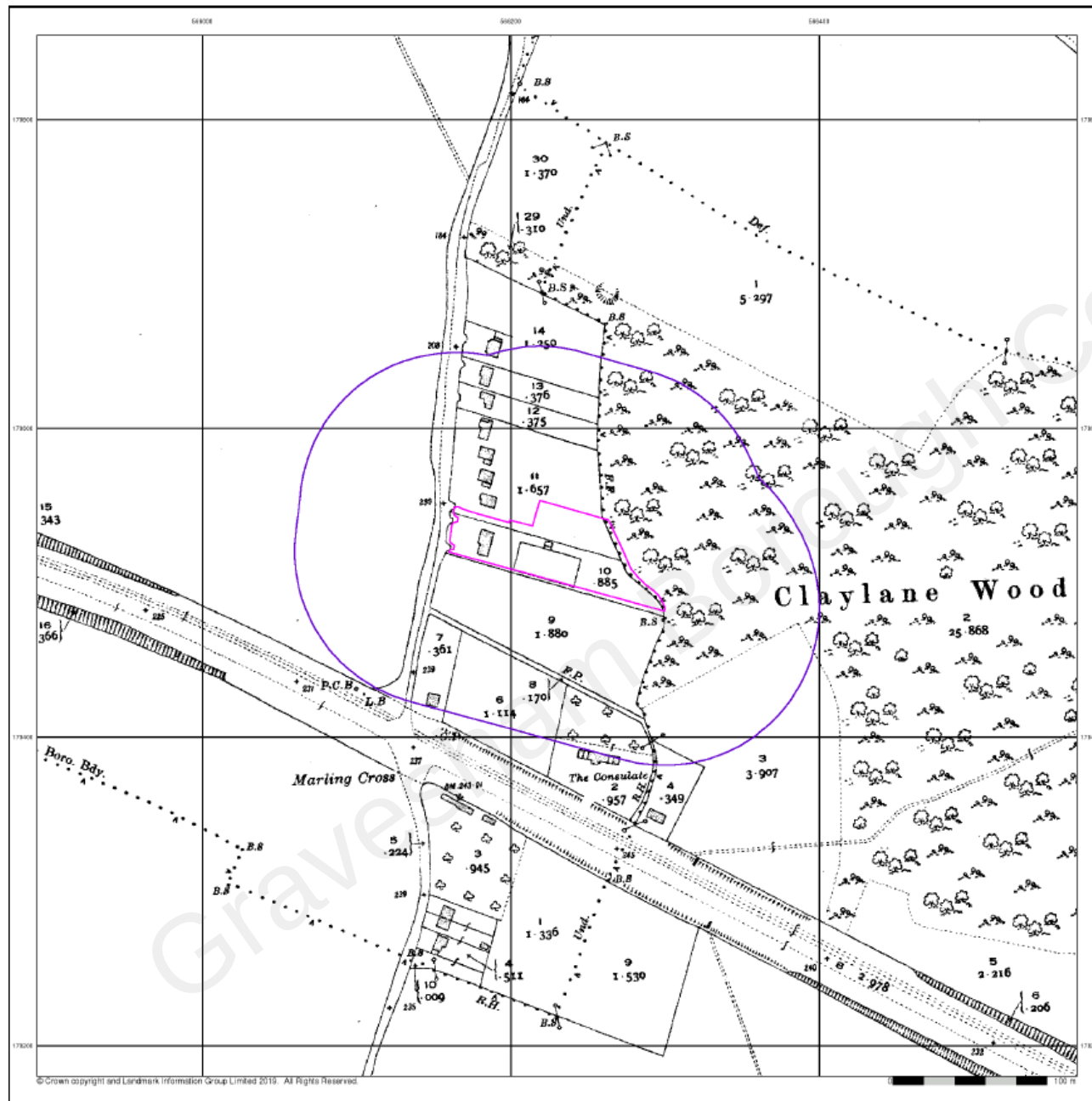
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service V50.0 05-Feb-2019 Page 4 of 16

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



Contaminated
Land
Solutions

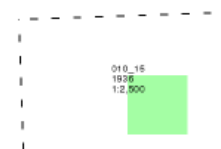
Kent

Published 1936

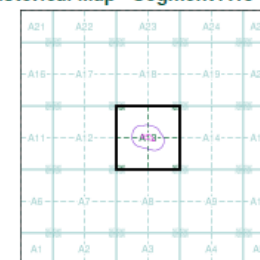
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840 s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 193011884_1_1
Customer Ref: 1532
National Grid Reference: 586230, 170520
Slice: A
Site Area (Ha): 0.48
Search Buffer (m): 100

Site Details

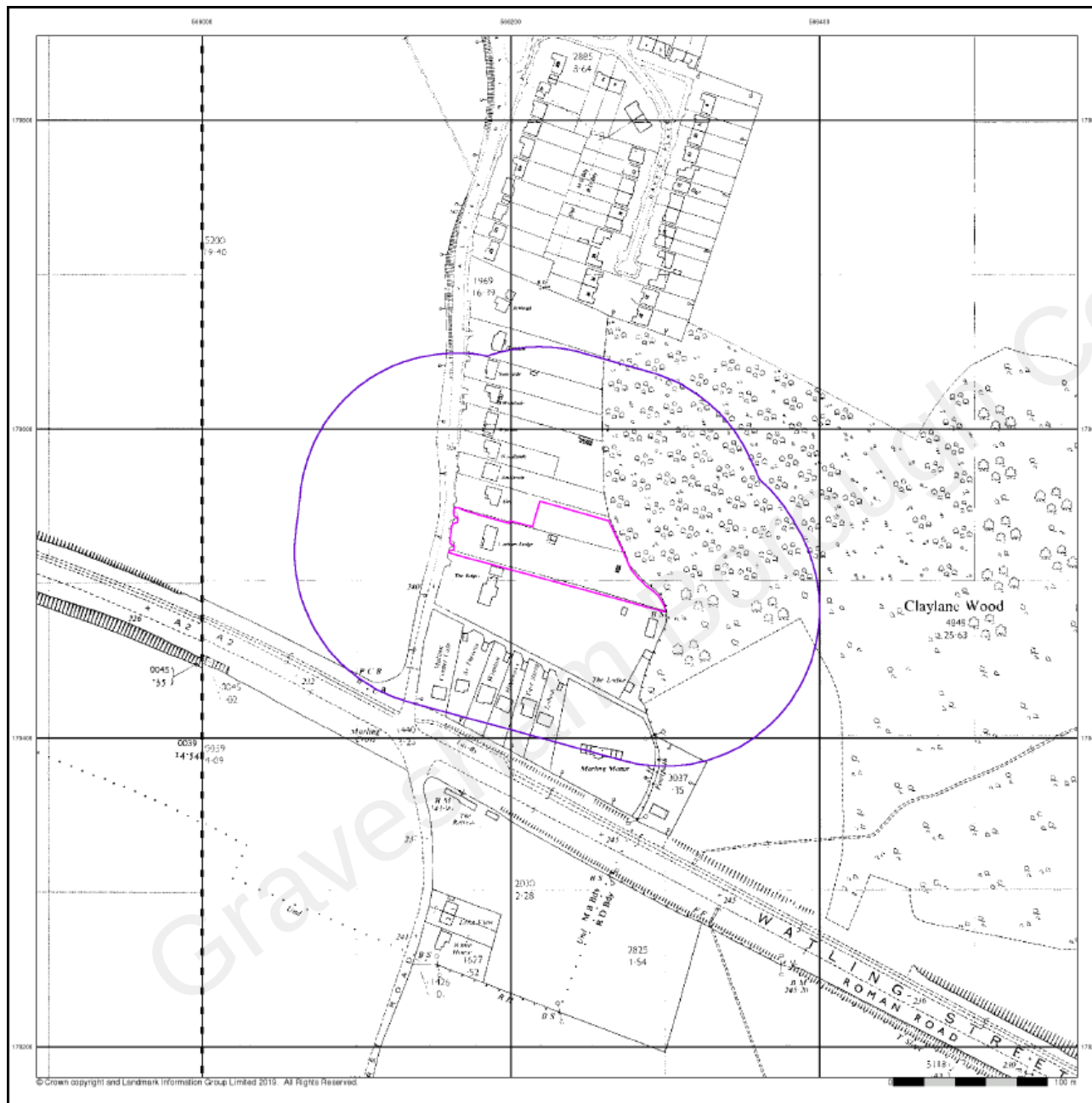
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v5.0.0 05-Feb-2019 Page 5 of 16

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



**Contaminated
Land
Solutions**

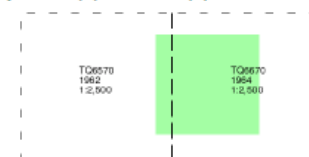
Ordnance Survey Plan

Published 1962 - 1964

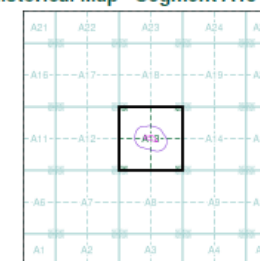
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840 s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1838, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 193011884_1_1
Customer Ref: 1532
National Grid Reference: 566230, 170520
Slice: A
Site Area (Ha): 0.48
Search Buffer (m): 100

Site Details

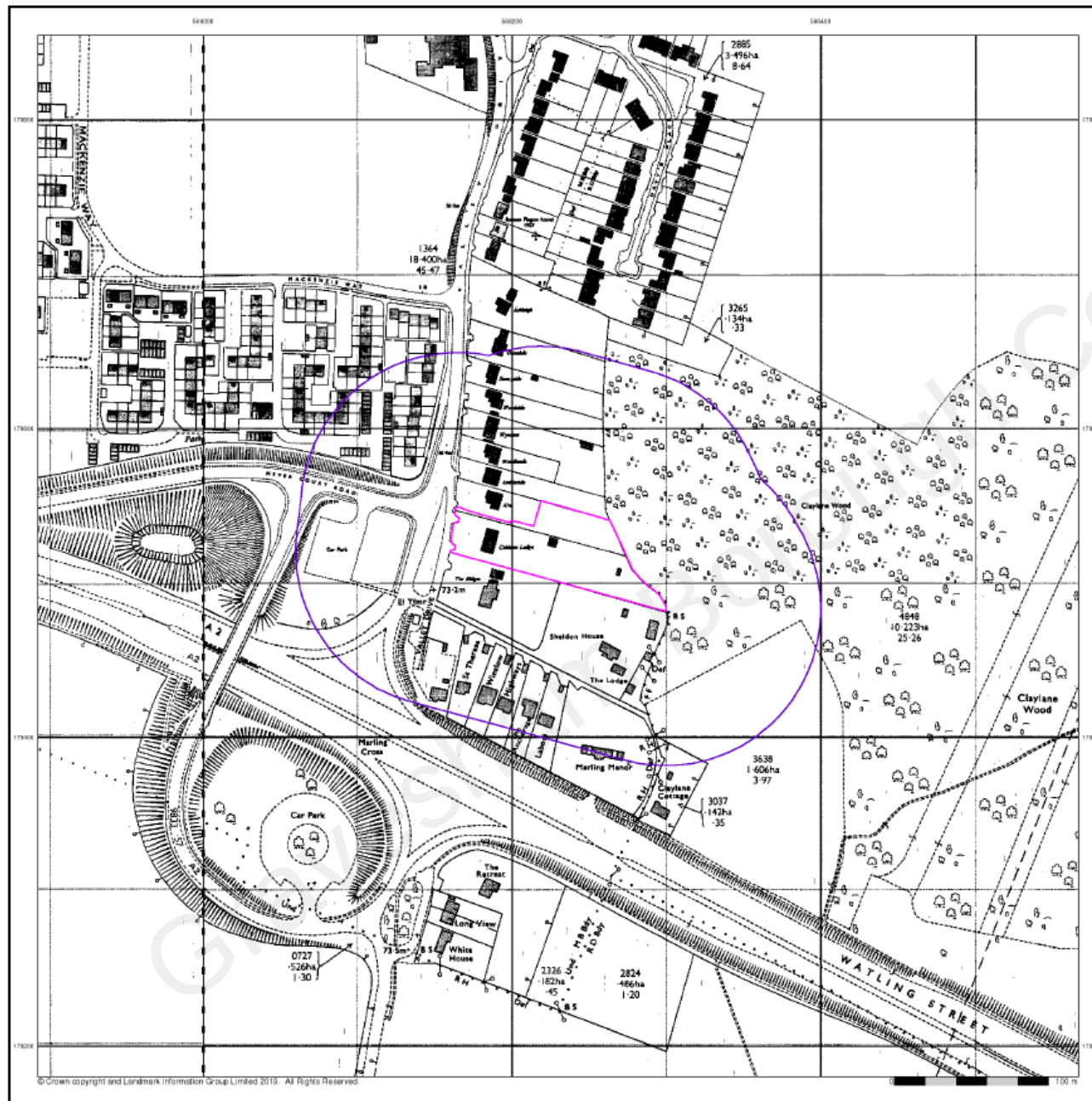
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v50.0 05-Feb-2019 Page 6 of 16

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



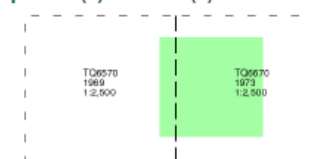
Ordnance Survey Plan

Published 1969 - 1973

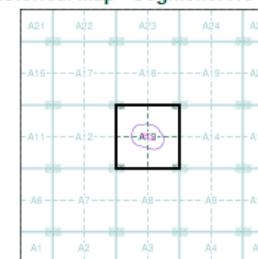
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 193011884_1_1
 Customer Ref: 1532
 National Grid Reference: 566230, 170520
 Slice: A
 Site Area (Ha): 0.48
 Search Buffer (m): 100

Site Details

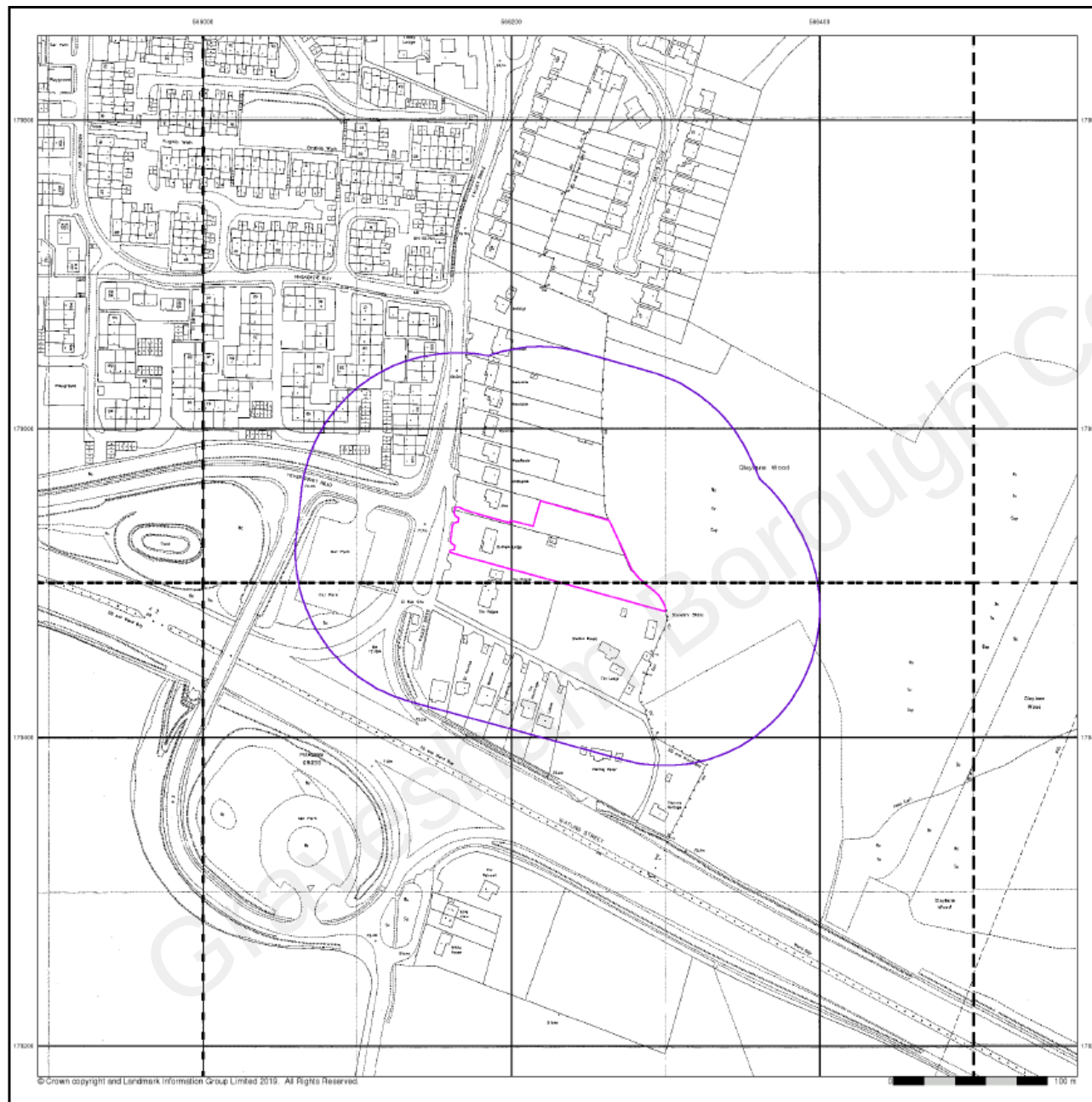
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE



Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

A Landmark Information Group Service v50.0 05-Feb-2019 Page 8 of 16

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



**Contaminated
Land
Solutions**

Large-Scale National Grid Data

Published 1993

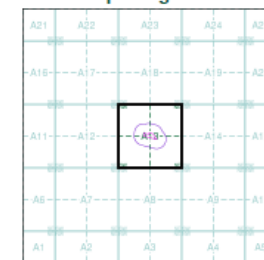
Source map scale - 1:1,250

Large Scale National Grid Data superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TQ6570NE 1993 1:1,250	TQ6670NW 1993 1:1,250	TQ6670NE 1993 1:1,250
TQ6570SE 1993 1:1,250	TQ6670SW 1993 1:1,250	TQ6670SE 1993 1:1,250

Historical Map - Segment A13



Order Details

Order Number:	193011884_1_1
Customer Ref:	1532
National Grid Reference:	586230, 170520
Slice:	A
Site Area (Ha):	0.48
Search Buffer (m):	100

Site Details

Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v50.0 05-Feb-2019 Page 14 of 16



10k Raster Mapping

Published 1999

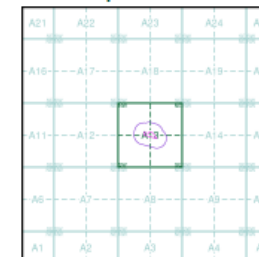
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TQ67SW 1999 1:10,000	TQ67SE 1999 1:10,000
TQ66NW 1999 1:10,000	TQ66NE 1999 1:10,000

Historical Map - Slice A



Order Details

Order Number: 193011884_1_1
Customer Ref: 1532
National Grid Reference: 566230, 170520
Slice: A
Site Area (Ha): 0.48
Search Buffer (m): 1000

Site Details

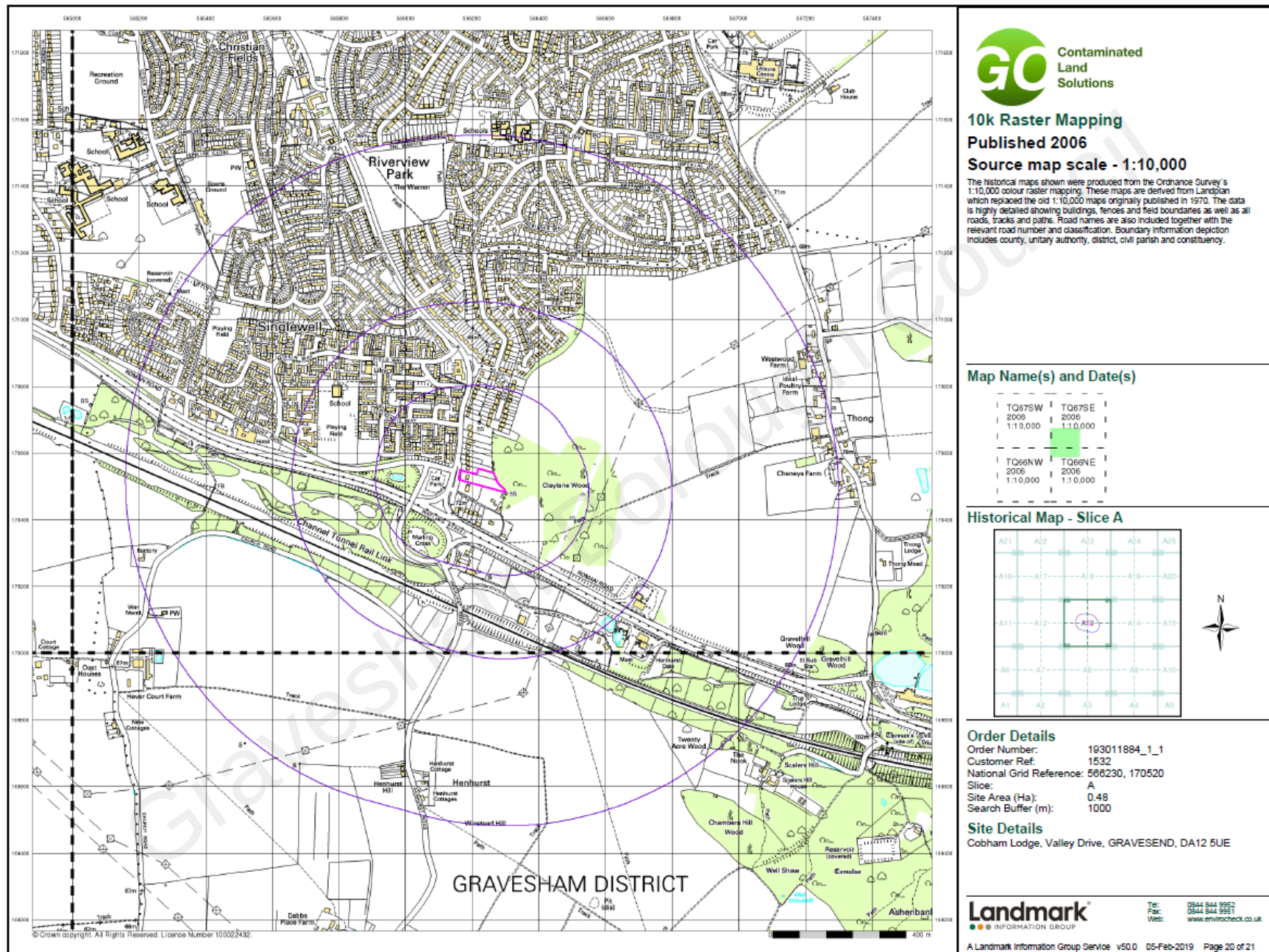
Cobham Lodge, Valley Drive, GRAVESEND, DA12 5UE



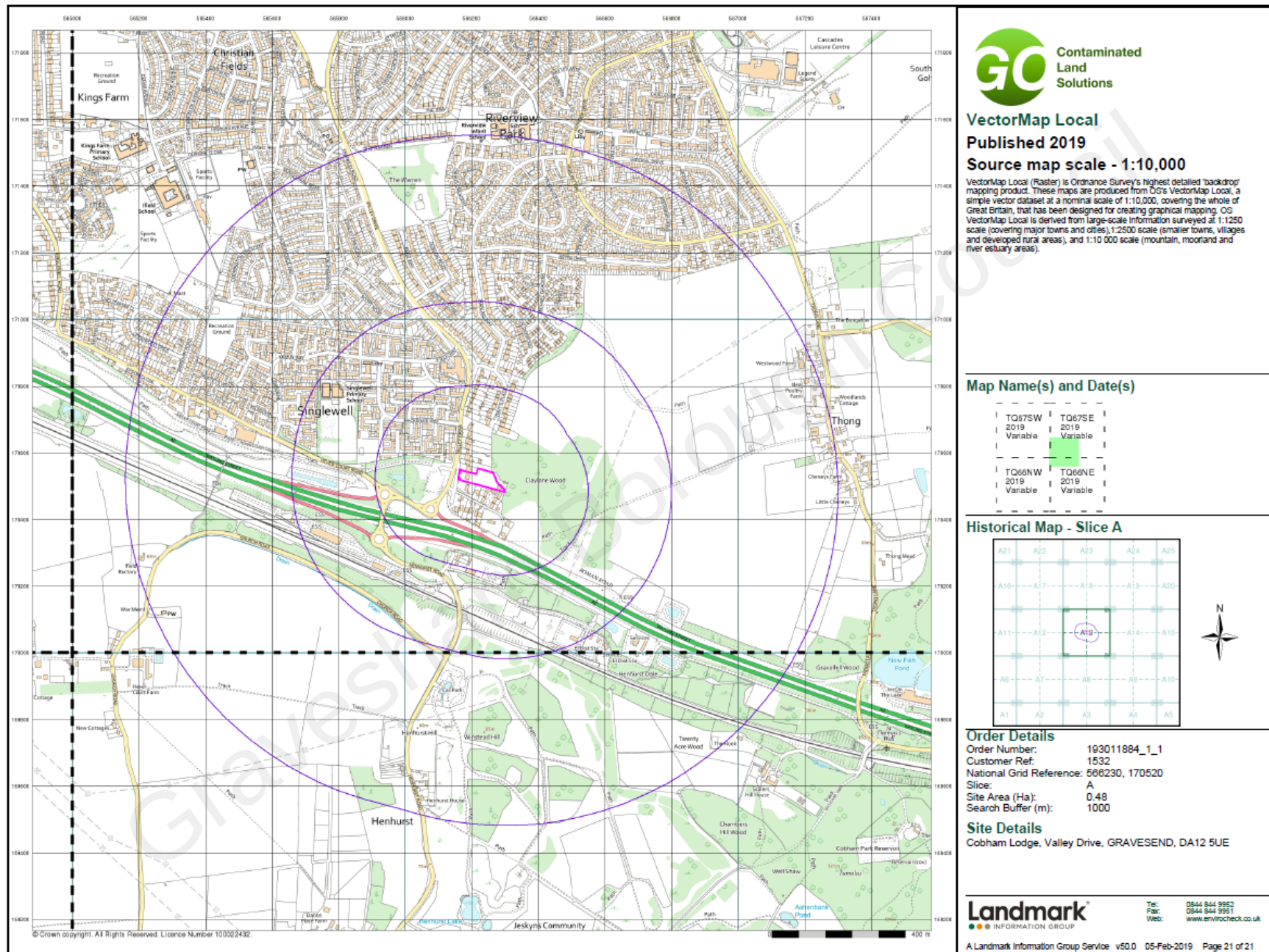
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v50.0 05-Feb-2019 Page 19 of 21

1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



1532-P1E-1-C: Cobham Lodge, Valley Drive, Gravesend



**Contaminated
Land
Solutions**

Appendix F – Local Authority Information

Dear Environmental Health Team,

Our client is proposing to redevelop the above property, a site location plan is attached. We will be purchasing a Landmark Envirocheck report and reviewing historical maps and the Envirocheck data for former potentially contaminative activities either on site or off-site. We will also be undertaking a site walkover to look for olfactory or visual evidence of contamination.

Do the council have any record of concerns regarding potential contamination of either this property or any nearby areas?

We appreciate any information you can provide.

Kind regards,

Daria Prihradska

Lead Environmental Consultant
BSc (Hons) AMIEnvSc



**Contaminated
Land
Solutions**

4 De Frene Rd, Sydenham, London, SE26 4AB
t 020 8291 1354 e dp@gosolve.co.uk
www.gosolve.co.uk



Dear Daria

Thank you for your enquiry. There is a charge of £56 for searching our records for the requested information. Please let me know if you wish to proceed and I will arrange an invoice for you.

Kind regards,

Kirstie Parr BSc AMIEnvSc
Scientific Officer - Contaminated Land
Regulatory Services
Gravesham Borough Council
Civic Centre
Windmill Street
Gravesend DA12 1AU
Tel. 01474 33 74 26
Fax. 01474 33 79 43
email. Kirstie.parr@gravesham.gov.uk
Gravesham Borough Council – Connecting with the Community
Please consider the environment before printing this email

Dear Kirstie,

Further to your email advising of costs for undertaking a search. We are of course keen to avoid charging our client for the same information twice. Could you please therefore advise if your search will identify items that are unlikely to be found on the full Landmark Envirocheck data package. If this is the case do you consider that the information you hold is essential to completing our phase 1 conceptual model and risk assessment.

Kind regards,

Daria Prihradka

Lead Environmental Consultant
BSc (Hons) AMIEnvSc



**Contaminated
Land
Solutions**

4 De Frene Rd, Sydenham, London, SE26 4AB
t 020 8291 1354 e dp@gosolve.co.uk
www.gosolve.co.uk



Only the intended recipient may distribute or make any use of this email.
We do our best however it is the recipient's responsibility to virus check any attached files.
Please consider the environment before printing.

Dear Daria

If you go to our planning portal <https://plan.gravesham.gov.uk/online-applications/> and check reference 20080381, there are some soil sample results which suggest some made ground may be present on the site. Other than that, I would only be replicating the information in the Landmark report.

Kind regards,

Kirstie Parr BSc AMIEnvSc
Scientific Officer - Contaminated Land
Regulatory Services
Gravesham Borough Council
Civic Centre
Windmill Street
Gravesend DA12 1AU
Tel. 01474 33 74 26
Fax. 01474 33 79 43
email. Kirstie.parr@gravesham.gov.uk
Gravesham Borough Council – Connecting with the Community
Please consider the environment before printing this email



Appendix G – Contacts

Local Authority Gravesham Borough Council	Building Control	01634 33 11 33
		building@stgbc.org.uk
		STG Building Control Partnership Foord Annex Eastgate House High Street Rochester Kent ME1 1EW
	Environmental Health	environmentalprotection.admin@gravesham.gov.uk Regulatory Services Gravesham Borough Council Civic Centre Windmill Street Gravesend Kent DA12 1AU

Environment Agency	National Customer Contact Centre PO Box 544 Rotherham S60 1BY	08708 506 506
		enquiries@environment-agency.gov.uk
Coal Authority	Mining Reports Office 200 Lichfield Lane Berry Hill, Mansfield Notts, HG18 4RG	www.coalminingreports.co.uk
Health Protection Agency, Radiation Protection Division	Chilton Didcot Oxon, OX11 0RQ	01235 822622
		radon@hpa.org.uk
		www.hpa.org.uk/radiation