

**Situation Report for
Downs Garage (former),
Southgate Street, Long Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

Mr James May
Willowwalk (Thaxted) Developments Ltd
45 High Street
Haverfordwest
SA61 2BP

Dear James,

Please find below our update on site conditions and proposed actions to address the historical contamination issues at the former Downs Garage site in Long Melford.

Background Information

The site is a cleared development plot located on Southgate Street in Long Melford. We understand that Willowwalk (Thaxted) Developments Ltd (Willowwalk) are proposing to redevelop the site with two semi-detached houses (Plots 1 to 4) and a row of terraced houses (Plots 5 to 9). We understand that an application for the site's redevelopment has been submitted to Babergh District Council and is currently under consideration.

We have been commissioned by Willowwalk to carry out the necessary works to ensure the site is suitable for redevelopment, with respect to historical hydrocarbon contamination issues associated with its former use as a petrol filling station. Our works are also intended to provide the necessary reports and documentation to assist in the discharge of conditions (relating to contamination) that are included within the any forthcoming Decision Notice.

As part of the application process Babergh District Council have requested an update on the environmental status of the site. This letter report therefore provides a summary of the works that we have already undertaken at the site, along with a review of the proposed actions we propose to carry out once planning approval has been received.

All the activities comprising this assessment were carried out in accordance with the procedures set out in our Quality Manual. Your attention is drawn to the Notice to Interested Parties included as Attachment One.

Summary of Previous Reports Relating to the Site

We have produced the following reports on behalf of Willowwalk over the course of the last two years.

Our Ref.	Report Title	Date of Issue	Report Reference
Ref.1	Remediation Strategy Report	December 2018	Fi03088 CL 015
Ref.2	Updated Detailed Quantitative Risk Assessment Report	February 2019	Fi03088 CL 016
Ref.3	Groundwater Monitoring Results	November 2019	Fi03088 CL 019

Table One: Previous Environmental Reports Relating to the Site

We understand that copies of these reports have been submitted to Babergh District Council as part of previous planning applications (as summarised in the table below). We have reviewed comments on these reports, from the Council's consultees (relating to contamination), as part of our current appraisal of site conditions. A summary of the various previous consultation responses are summarised below and these have been used to develop our future strategy for dealing with the legacy environmental issues that are associated with the site.

Client: Willowwalk (Thaxted) Developments Ltd	Subadra Consulting Ltd. Registered in England No. 4586038 Registered Office 13 Triangle Business Park, Stoke Mandeville, HP22 5BL	Our Ref	Fi03088 CL 020
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Review of Recent Planning History

The planning applications previously submitted to Babergh District Council, relating to the site's development for residential end-use are summarised in the table below.

Date	Application Number	Local Planning Authority – Planning Records (from local planning authority website)	Development Status
July 2013	B/13/00875	Erection of 3 No. detached dwellings (demolition of redundant filling station building)	Approved with conditions (not completed)
April 2017	17/00938	Application to vary conditions 2, 7, 9, 10, 12, 14, 16 & 17 attached to B/13/00875/FUL	Approved
December 2017	DC/17/05298	Application for Lawful Development for Existing Use. Erection of 3 No. detached dwellings, as approved by Planning Permission reference B/13/00875/FUL.	Approved
December 2018	DC/18/05362	Discharge of Conditions Application for B/17/00938 (including 8, 9 and 10 - relating to contamination)	Part discharge
August 2019	DC/19/04091	Erection of 4No dwellings and 15No flats with associated garaging, parking and landscaping.	Application withdrawn
December 2019	DC/19/05843	Erection of 4no dwellings and 12no flats, including affordable dwellings and new footpath link.	Application withdrawn

Table Two: Summary of Planning Records for the Site

Local Planning Authority Consultations

Both Babergh Council's Environmental Health department and the Environment Agency have provided comment on previous applications for the site's redevelopment, as summarised in the table below.

Whilst we understand these comments may not be directly applicable to the current application, we consider any future requirements are likely to in-line with these previous comments, and as such they have been considered when determining our future strategy for the site.

Date / Planning Application	Consultee Comment
Babergh Council's Environmental Health Department	
24 th September 2019 19/04091	Environmental Health is aware that the site has undergone intensive investigation over the last decade to assess the residual contamination risks at the site. However, this new application for a revised scheme has no details of the current situation at the site or any form of proposed remedial works reflective of the scheme as proposed. Until the applicant adequately addresses contamination within this new application Environmental Health would be minded to recommend that the application be refused.
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<p>28th January 2020 19/05843</p>	<p>There is a suspicion that the site may be contaminated or affected by ground gases. However, in light of the findings of the documents submitted with the application Environmental Health would have no objection to the proposed development, provided that the attached condition is included with any permission that may be granted.</p> <p>No development shall take place until:</p> <ol style="list-style-type: none"> 1. A strategy for investigating any contamination present on site (including ground gases, where appropriate) has been submitted for approval by the Local Planning Authority (LPA). 2. Following approval of the strategy, an investigation shall be carried out in accordance with the strategy. 3. A report shall be submitted for approval by the LPA detailing the findings of the investigation and an assessment of the risk posed to receptors by the contamination . Subject to the results of the risk assessment, a Remediation Scheme may be required. 4. Any remediation work shall be carried out in accordance with the approved Remediation Scheme. 5. Following remediation, evidence shall be provided to the Local Planning Authority verifying that remediation has been carried out in accordance with the approved Remediation Scheme.
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Environment Agency

<p>18/05362 15 January 2019</p>	<p>The Detailed Quantitative Risk Assessment undertaken in 2011 is now considered out of date. The risk assessment will need to be updated taking into account current guidance.</p>
<p>18/05362 25th February 2019</p>	<p>With reference to Subadra's DQRA (Ref.2), the input parameters used in the risk assessment appear reasonable. However, given the contaminants of concerns are predominantly hazardous substances we can only accept the site specific target levels derived using the 50m compliance point.</p> <p>The EA agrees that the Remedial Strategy and Verification report will need to be reviewed and revised once any remedial excavations have been carried out (the results of these works should also be provided).</p> <p>The risk assessment only considers dissolved phase contamination. Provision for free phase removal will also need to be included into the revised Strategy, if shown to be necessary, as well as provision for post-remedial monitoring.</p>
<p>19/04091 20th September 2019</p>	<p>Remedial Targets Methodology outputs have not been provided so it is not possible to review parameters used in the spreadsheets. Please forward this for review.</p> <p>Given the contaminants of concerns are predominantly hazardous substances we can only accept the site specific target levels derived using the 50m compliance point. We agree the Remedial Strategy and Verification report will need to be reviewed and revised post excavation (the results of the works should also be provided).</p> <p>The risk assessment only considers dissolved phase contamination. Provision for free phase removal will also need to be included into the revised Strategy, if shown to be necessary as well as provision for post remedial monitoring.</p>

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24th January
2020
19/05843

The two available Subadra reports: Remediation Strategy and Verification Plan (December 2018) and the updated DQRA (February 2019) whilst providing useful information, are not targeted to the current proposed development. No additional information in relation to the contamination status of soils and groundwater on site has been provided for review, other than the above mentioned groundwater monitoring results.

No development shall take place until the following components, to deal with the risks associated with contamination of the site, are submitted to and approved by the LPA:

1.) Site Investigation, Revised Remedial Strategy and Verification Plan

(i) A fresh, standalone, geo-environmental interpretative report and updated DQRA, considering all the historic and current ground investigation results and monitoring data, with particular attention to the assessment of the hydrogeological regime and groundwater contamination at the site, including:

- Maps showing the groundwater contour levels on site (both River Terrace Deposits and Chalk), and the relationship between groundwater and the River Colne.
- Maps showing the hydrocarbon contamination plume evolution at suitable time horizons, based on historic and recent monitoring data.
- A sound, defensible, site conceptual model.
- The Remedial Targets Methodology outputs (missing from previous submissions).
- A comparison between the site specific target levels (using a 50m compliance point) and the measured groundwater quality monitoring data, highlighting any exceedance of the remediation target criteria.
- If required, a updated remediation options appraisal and remediation strategy report, to include the provision for free phase removal and post remedial monitoring.
- The results of the already completed remediation works.

(ii) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy (in 1) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

2.) Verification Report

No occupation of any part of the development as permitted shall take place until a verification report demonstrating completion of works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved by the local planning authority.

3.) Long Term Maintenance Plan

No development should take place until a long-term monitoring and maintenance plan in respect of contamination shall be submitted to and approved by the LPA, including details of any necessary contingency action arising from the monitoring.

On completion of the monitoring specified in the plan, a final report demonstrating that all long-term remediation works have been carried out and confirming that remedial targets have been achieved shall be submitted to and approved by the LPA.

Table Three: Summary of Previous Consultee Comments

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Existing Remedial Strategy: Progress Review

The table below provides an update on the works that have been completed within the last 2 years. We have based our review on the actions presented within Section 7 our previous Remedial Strategy report (Ref.1). Whilst we acknowledge that some revisions to our current strategy may be required, in response to forthcoming regulator comments and, potentially, the results of future investigation works, we do not consider this strategy will need to be altered substantially.

	Remedial Action	Details	Date of Completion
1.1	Excavation and Removal of Hydrocarbon Impacted Soils	~1,200tonnes of hydrocarbon impacted soils have been excavated and removed from the site. Details of these works are included within our remediation update report (ref.2). Re-instatement only partially complete.	Excavation works completed in November 2018
1.2	Reinstatement of Excavations and Installation of Wells	Six monitoring wells were installed (to a maximum depth of 3.7m) once all excavation works had been completed, to enable us to verify the impact of the remedial actions on groundwater quality (within the River Terrace Deposits). No monitoring wells have, as yet, been installed into the underlying chalk aquifer.	Wells installed November 2018.
1.3	Groundwater Treatment	The requirement for further groundwater treatment is subject to a review of site data and revisions to our Conceptual Site Model and Detailed Quantitative Risk Assessment. Current data suggest extensive groundwater treatment (e.g. Use of pump and treat) is unlikely to be required. However, the use of chemical reagents (e.g. chemical oxidants and/or oxygen releasing compounds) may be adopted or proposed as a contingency measure if the concentrations of dissolved hydrocarbons fail to reduce further.	Not yet completed
1.4	Engineering Controls	A cover system will be required in areas of soft landscaping (design to be confirmed as part of revised Remedial Strategy)	To be completed as part of construction phase of the proposed development
1.5		Installation of gas protection may be required beneath some/all of the new buildings (subject to results of additional site testing).	
1.6		Hydrocarbon resistant 'barrier pipe' to be used for all new water supply pipes as a precautionary measure.	
1.7	Validation of Remedial Works	Two rounds of groundwater monitoring and sampling have been carried out since the remedial excavation was completed. The results of the monitoring has confirmed no free-phase is present, but the chemical analysis indicates residual dissolved phase hydrocarbons remain present (albeit at reduced concentrations).	Monitoring and sampling carried out during May and November 2019

Table Four: Previous Environmental Reports Relating to the Site

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Summary of Future Environmental Works

Subject to a positive planning determination, we understand that the site owner proposes to commence the redevelopment in early/mid-2021. Based on the correspondence reviewed for previous applications, we would anticipate that the Decision Notice for the application currently being submitted will contain Conditions relating to ground contamination and that these conditions could be stipulated as pre-commencement actions. Our on-going environmental works have been designed to provide us with the necessary information to assess site conditions and determine a suitable remedial strategy for the site, whilst also enabling the discharge of future planning conditions.

A review of the environmental works we are likely to progress, subject to a review of future planning conditions, are presented in the table below.

Action	Summary of Proposed Works
Additional Investigation	In response to the comments provided by the LPA's consultees, we understand that further investigation works are required prior to the commencement of any future redevelopment. This includes an assessment of groundwater quality of the underlying Upper Chalk Formation and monitoring for hazardous ground gases. The results of our investigation will be provided as a standalone report. Details of these works are provided in the section below.
Revisions to our Detailed Quantitative Risk Assessment	We shall use the results of all relevant investigation works to refine our Conceptual Site Model and revise our Quantitative Risk Assessment. This will include an assessment of both human health and controlled water receptors. For our assessment of controlled water receptors a compliance point of 50m to be included in modelling and output spreadsheets to be provided to the EA.
Revisions to our Remedial Strategy	The results of the proposed groundwater quality assessment will allow us to verify whether our current remedial strategy is appropriate, or whether a more aggressive approach is required.
Remedial Works	The exact nature of the remedial works we propose to complete at the site will be determined once we have reviewed all new site data and completed revisions to our Detailed Quantitative Risk Assessment. However, in summary, we consider they are likely to comprise the following: <ul style="list-style-type: none"> ➤ The implementation of engineering controls in order to mitigate risk to future residents. ➤ An appraisal of the feasibility of monitored natural attenuation (MNA) to further reduce any residual dissolved hydrocarbons. ➤ In the event that MNA is not considered an appropriate standalone remedial solution, we will review alternative remediation technologies, such as the injection of chemical reagents (oxidants to directly reduce hydrocarbons and/or oxygen release compounds to enhance the natural attenuation).
Validation of Remedial Works	Each component of our revised remedial strategy will need to be suitably validated to confirm any residual contaminants are reduced to acceptable levels and/or engineering controls have been successful to break any critical pollutant linkages. Details of these validation processes will be included within our revised remedial strategy report.

Table Five: Summary of Proposed Environmental Works

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Next-Steps

The works we propose to complete once planning has been granted are summarised in the table below.

Drilling	<p>We propose to construct 3No. additional deeper boreholes into the underlying Upper Chalk Formation (a Principal Aquifer) using rotary drilling methods. Appropriate drilling methods will be adopted to ensure the risk of any shallow hydrocarbon impact being allowed to migrate into the chalk is mitigated.</p> <p>Existing site data suggests that the surface of the chalk is present at ~7m below ground level. Boreholes are therefore likely to be installed to depths of at least 10m (potentially deeper, subject to site observations during drilling - boreholes will extend at least 3m in to the chalk). A site plan showing proposed borehole locations is provided below.</p>	
	River Terrace Deposits	The 6No. Existing monitoring wells (MW1-MW6) are to be retained to allow on-going quality review of shallow groundwater.
Monitoring Wells	Chalk Aquifer	<p>All three of the new boreholes will be completed as groundwater monitoring wells.</p> <p>Monitoring wells will be screened (with filter sock and a suitable gravel pack) from 0.5m below the surface of the chalk to the base of the borehole. From surface to the top of the screened section will comprise plain well material with a bentonite seal.</p>
	Ground Gas	Further to a review of the design of the existing monitoring wells, a small number of additional shallow gas monitoring wells may be installed.
Sampling Procedures	Soil	Representative soil samples will be recovered from each borehole in sealed liners and logged onsite by a suitably qualified technician.
	Groundwater	<p>We will return to the site to complete groundwater monitoring a minimum of 48hours after drilling works have been carried out.</p> <p>Prior to sampling, we will record at-rest ground water levels in each well using an oil / water interface probe. Groundwater samples will then be collected using low flow techniques (i.e. a peristaltic pump incorporating flow-through tubing, discharging via a multi-parameter cell which allows for the measurement of pH, conductivity, temperature, redox potential and dissolved oxygen).</p> <p>As part of our groundwater monitoring visit, we will complete permeability testing and a survey of borehole elevations to assist us in determining the direction of groundwater flow beneath the site.</p>
	Hydrocarbon Vapours (soil and groundwater)	We will carry out (semi-quantitative) screening for hydrocarbon vapour concentrations on all soil samples collected and on all wells prior to monitoring using a photo-ionisation detector (PID) calibrated with isobutylene gas.
	Screening for Hazardous Ground Gases	We will carry out a minimum of three rounds of screening for hazardous ground gases using GA5000 series landfill gas monitor, designed to record concentrations of methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen (and flow readings).

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Sampling Procedures (continued)	Sample Preservation	Sub-samples were preserved in glass jars or bottles and stored in cool boxes during transportation to the laboratory for subsequent analysis.
Chemical Analysis	<p>Representative soil and groundwater samples will be analysed for compounds we consider to be representative of automotive fuels and oils, including:</p> <ul style="list-style-type: none"> ➤ Benzene, Toluene, Ethylbenzene and Xylenes (BTEX compounds) and MTBE, ➤ Speciated Total Petroleum Hydrocarbons (TPH), and ➤ Speciated polycyclic aromatic hydrocarbons (PAHs). 	
Reporting	Additional Investigation Report	Our additional investigation report will provide full details of the works completed, including: borehole logs and a location plan; review of geology and groundwater regime (including piezometric plots for groundwater within drift deposits and the underlying chalk aquifer); chemical analysis results for soil and groundwater; a preliminary assessment of the occurrence natural attenuation; and the results of our ground gas monitoring and a ground gas risk assessment.
	Risk Assessment	The data obtained during our investigation works (previous and new) will be used to refine our Conceptual Site Model, make revisions to our Detailed Quantitative Risk Assessment.
	Remedial Strategy	If the results of our risk assessment indicate viable pollutant linkages are still present and a continued risk to identified human and/or environmental receptors we will re-visit our remediation options appraisal and refine our remedial strategy.

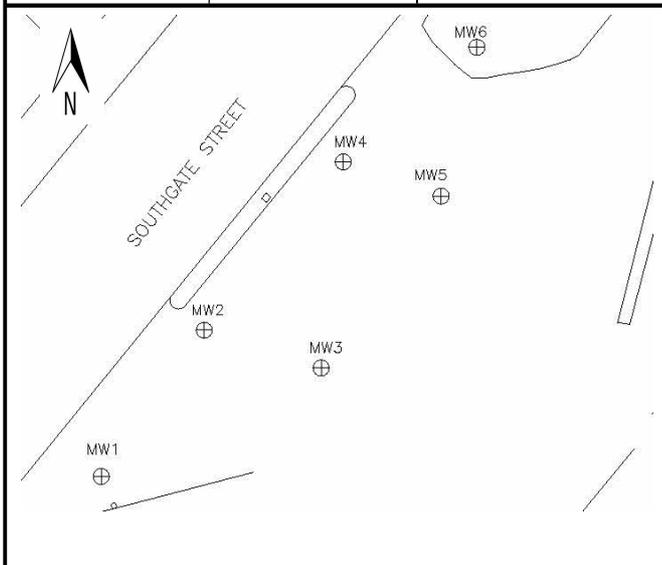


Figure One: Existing Monitoring Wells (MW1-MW6) (installed November 2018, post remedial excavation)

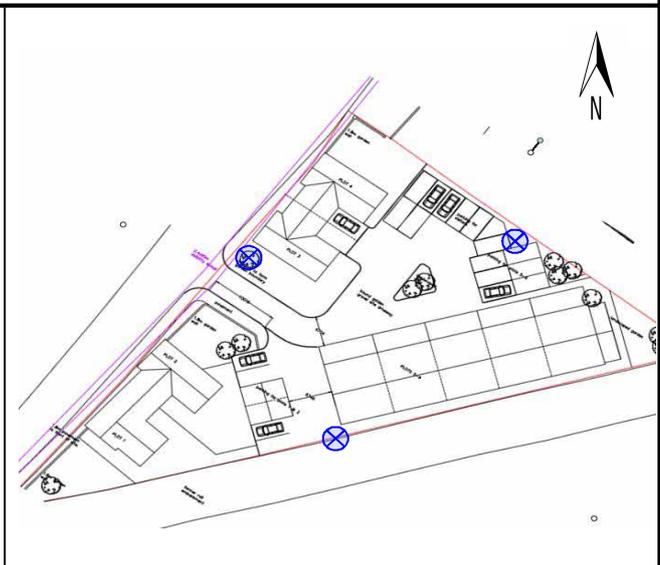


Figure Two: Proposed location of new deeper wells, installed into chalk aquifer.

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Regulator Comment

We recommend this update letter report be issued to the Local Planning Authority in support of the current application for the site's redevelopment.

Yours Sincerely



James Edley

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