

**Former Tollgate Hotel,
Watling Street, Gravesend**



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

BP Pulse
Chertsey Road
Sunbury On Thames
TW16 7BP

Dear Sirs,

Proposed Scope of Works to Inform Revised Hydro-geological Risk Assessment

Please find below a description of the additional works we propose to complete in order to revise and update our 'Appraisal of Tank Risk' document (report ref. BP12945 CL 008a, April 2024).

Introduction

The site is located on Watling Street, near the eastbound A2, south of Gravesend and currently comprises the derelict hotel and restaurant. We understand that BP Oil UK Ltd (BP) proposes to redevelop the site for commercial use, comprising the construction of a sales building, surrounded by Electric Vehicle (EV) charging bays, a canopy-covered petrol and diesel forecourt, a below ground tank farm and associated petroleum infrastructure. A planning application for the proposed development has been submitted to Gravesham Borough Council planning authority (application reference: 20240856).

Due to the site's 'high' environmental sensitivity, being located overlying a Chalk Principal Aquifer and located within a Source Protection Zone (II), we have previously prepared the following documents, to submit the the planning authority, in support of the application:

- Geo-environmental Investigation Report, September 2012 (report ref. 12954 CL 002).
- Infiltration Test Report, December 2022 (report ref. 12954 CL 007b).
- Phase 1 - Environmental Assessment Report, May 2024 (report ref. 12954 CL 006d).
- Appraisal of Below Ground Tank Installation, May 2024 (report ref. 12954 CL 008b).

As statutory consultee to the Local Planning Authority, the Environment Agency (EA) have reviewed these documents and, based on the information presented, objected to the application (EA letter reference KT/2024/132078/01-L01, dated 19th November 2024). The EA, within their objection letter, set out the requirements for further assessment that would be required for them to make a more complete assessment of the risk of pollution associated with the development; in summary these were as follows:

'Overcoming our Objection: Provide suitable assessment of the risks to groundwater associated with the proposed development and in particular to the implementation of underground storage tanks. This information must satisfactorily demonstrate to the local planning authority that the risks to controlled waters have been fully understood and can be addressed through appropriate measures. This information should include a suitable hydrogeological risk assessment (HRA) for the proposed development.'

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In order to clarify their exact requirements, we attended a meeting with the EA (held remotely on 8th January 2025, under a charge agreement arrangement between Subadra Consulting Ltd and the EA). The meeting allow us to clarify with the Environment Agency on their requirements for the Hydrogeological Risk Assessment and the dialogue has enabled us to agree a clear route forward.

This document is intended to provide a description further works that will be completed, prior to the commencement of the development, in order to provide the EA with the necessary information to allow them to remove their planning objection.

Environment Agency's Requirements

Our understanding of the EA's requirements are summarised as follows:

Hydrogeological Risk Assessment (HRA)

The EA noted that they would consider the installation of below ground fuel storage facilitates at the site, provided a Hydrogeological Risk Assessment, based on a detailed appraisal of the site's geology and hydrogeology, was provided for review.

Specifically any assessment should include detail and review the following:

- An assessment of site geology, extending into the saturated chalk layers.
- The depth to groundwater within the chalk formations.
- The direction of groundwater flow beneath the site.
- All potentially at-risk environmental receptors associated with the site.

Forecourt Drainage

The EA have advised that they consider forecourt drainage to be a key risk to groundwater pollution, which must therefore be considered within any future appraisal of risk.

We understand that the following information is required:

- A review of the proposed drainage infrastructure and an appraisal of whether these are adequate to intercept any uncontrolled loss of fuel. Considered scenarios should include the low level spillages that can occur during customer re-fuelling, but also in the event of a catastrophic fuel loss, such as a tanker rupturing and spilling a large volume of fuel onto the forecourt.
- The review must include details of any interceptors and soakaways, followed by an appraisal of any risks associated with these drainage features, and how the drainage design will mitigate those risks.
- The review must include an appraisal of how the drainage features, including any permeable paving that is proposed, will be maintained and also assess the risk of pollution in the event of these features were to 'fail' at any point in the future. The document should also form the basis of the site's 'maintenance and management plan', which will be required under planning.
- An appraisal of whether the the proposed drainage complies with current best-practice guidance (providing justification if it does not).

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Proposed Further Works

We propose to undertake the following set of works, as discussed in our meeting with the Environment Agency on Wednesday 8th January 2025, to address their concerns. It is the intention to complete these works once planning has been decided and we anticipate the works specified below will be incorporated into the pre-commencement conditions applied to the planning Decision Notice.

Monitoring Well Installation

In order to obtain the necessary information to complete our Hydrogeological Risk Assessment, we propose to carry out the following works:

- Construct 3 No Boreholes into the chalk formation saturated zone (i.e. Below the 'water table').
- Information provided by the EA from a groundwater monitoring station in close proximity to the site shows that groundwater depth varies seasonally, it *generally* fluctuates within a range of 8mAOD to 13mAOD. Site surface levels range from ~43m AOD to >46mAOD, which would indicate a depth to groundwater across the site of between 35m to 38m (during the drier summer months when groundwater levels are at their lowest). Borehole depth will therefore need to be a minimum of 40m, to ensure we are able to capture adequate groundwater data to demonstrate we understand seasonal variations groundwater levels.
- Drilling will be conducted using rotary coring, in order to provide cores that can be logged, to provide information regarding the chalk composition, as well as any fractures/fissures encountered within the deeper chalk bedrock.
- Groundwater monitoring wells will be installed at all three borehole locations, in order to enable the collection of groundwater data across the site. Monitoring wells will be 50mm diameter and, based on our current understanding of the chalk formation, will be screened from 10m downwards.
- A suitably inert gravel pack will be installed surrounding the screened section of the monitoring wells once installed, with bentonite clay 'seal' surrounding the plain (i.e. Non-screened) section.
- Final borehole locations will need to be determined once on-site service checks have been carried out. However, boreholes will be positioned such that they will allow triangulation of groundwater depth, which in turn can be used to demonstrate groundwater flow direction.
- As we are not targeting and specific source of current and/or historical contamination, boreholes are likely to be placed around the peripheries of the site, in areas what will be fully accessible prior to, during and post-development. They will not be located in close proximity to the proposed / future below ground fuel infrastructure, to mitigate the risk of creating a direct pollutant migration pathway, in the unlikely event of a future uncontrolled loss of fuel.
- Procedures will be put in place to minimise the risk of the monitoring wells being damaged during construction. This will be formalised within our updated Hydrogeological Risk Assessment and included within the site's 'maintenance and management plan' (assuming the wells are to be maintained post-development).
- It is our current understanding that the groundwater monitoring wells should be decommissioned, in accordance with Environment Agency guidance, upon completion of the development works. The final determination on well decommissioning will be made once out post-development monitoring data has been collated and reviewed. If any / all of the monitoring wells are to be retained, the EA will be notified and appropriate updates made to the site's 'maintenance and management plan', so that the well(s) can be suitably maintained and protected from damage/interference.

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Groundwater Monitoring

We propose to carry out monitoring the following monitoring of groundwater levels.

- Installation of in-situ water level loggers (Divers) in each well with quarterly validation/data collection visits for the period of one year (from installation), in order to obtain groundwater levels across varying seasonal conditions;
- Immediately prior to the start of the construction phase;
- Monthly during the construction process;
- After all groundworks have been completed, but prior to occupation; and
- Prior to decommissioning of the wells.

Groundwater Sampling

We propose to carry out four rounds of sampling of groundwater quality, as follows:

- First sampling round: ~2months post installation of the wells;
- Second sampling round: Immediately prior to the start of the construction phase;
- Third sampling round: ~8 weeks into the construction process; and
- Fourth sampling round: After all groundworks have been completed, but prior to occupation.

The first and second rounds are intended to provide a baseline condition report on groundwater quality, prior to development. The third and fourth are to verify that the construction works have not led to any deterioration of groundwater quality.

Chemical Analysis

The site has historically been used as a pub/restaurant and had various buildings associated with a recreation area and motel. We have not identified any potentially contaminative industrial activities which have occurred at the site. The potential for on site contamination is confined to Made Ground and waste associated with building demolition/redevelopment. During our previous investigations, no olfactory or visual evidence of hydrocarbons was encountered. The analysis of soil samples carried out as part of this investigation identified low concentrations of Total Petroleum Hydrocarbons in the range C₁₂-C₃₅ (at shallow depths). These compounds were indicative of mineral oils or greases, rather than automotive fuels. The primary off-site potential sources of contamination two nearby petroleum filling stations.

The purpose of the analysis is also to verify that any construction activities have not impacted groundwater, either directly or by mobilising any previously unidentified historical contamination. Potential contaminants associated with construction activities include: fuels, oils etc.

On this basis, and whilst we do not anticipate finding any potential contaminants of concern, we propose to complete the following chemical analysis on the groundwater samples collected

- Total Petroleum Hydrocarbons, reported by carbon range and with aromatic and aliphatic speciation;
- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and MTBE
- Polycyclic Aromatic Hydrocarbons

We do not anticipate the foundations for the development will comprise piling (certainly not to depths consistent with groundwater), so we do not consider analysis for turbidity to be relevant to our assessment.

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Reporting

The purpose of all of the additional works proposed within this document is to enable us to prepare a revised/updated and more comprehensive 'appraisal of pollution risk', including a which will in turn support the completion of a Hydrogeological Risk Assessment, in accordance with the requirements of the Environment Agency's 'Approach to groundwater protection', and specifically position statement D2, which relates to the underground storage (and associated pipework) of potential pollutants (which includes automotive fuels).

The revised report will include the following:

- Details of the monitoring well installation process and the initial groundwater monitoring data;
- An appraisal of the soil strata and groundwater levels/direction of flow;
- A review of the site's environmental sensitivity, to identify all potential at-risk receptors and assess the viability of any identified migration pathways;
- Identification of all potential risks associated with the development of a retail filling station in a highly environmental sensitivity area, detailing any mitigation measures that are to be adopted, and based on this information an appraisal of the identified risks.

It is our intention that the report will present the information requested by the Environment Agency during our recent meeting (and summarised above).

The document will be considered a 'live' document and be updated as new groundwater monitoring data becomes available. As a minimum we anticipate issuing versions of the report after the first round of monitoring, pre-commencement of construction activities and pre-occupation of the development.

Removing the EA's Objection

The EA have confirmed that by providing this scope of works for the investigation and assessment we intend to carry, for the development of a suitable Hydrogeological Risk Assessment for the site, they will remove their objection to the planning application (application reference: 20240856).

We understand that to formalise the actions set out within this letter, the EA will request these requirements are included as a condition within any subsequent Decision Notice.

We understand that the review of this document will be carried out by the Environment Agency under the existing charge agreement (Agreement number: ENVPAC/1/KSL/00798, set up in December 2024). A copy of this letter will also, however, will be submitted to Gravesham Borough Council planning authority in support of planning application reference: 20240856.

The EA are aware that the proposed layout for the service area, potentially including parts of the fuel and/or drainage infrastructure, may change. They have requested that, whilst our Hydrogeological Risk Assessment (and any other reports associated with pollution risk) should be based on the currently proposed layout and should be considered an active document that must be updated as the proposed development is updated to ensure environmental risks are managed (and that the EA should be provided with updated copies too).

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We trust the information provided within this letter will enable the Environment Agency to remove their objection to the proposed development. Once planning has been determined, we will progress with the additional site based activities and subsequent reporting/assessment.

However, if you have any questions or require any clarification relating to our proposed scope of works, please contact me directly.



James Edley

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Attachments:

Attachment One: Notice to Interested Parties

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**ATTACHMENT ONE:
NOTICE TO INTERESTED PARTIES**

NOTICE TO INTERESTED PARTIES

The purpose of our work is to provide general information on the environmental And/OR geotechnical conditions existing at the site And related to soil And/OR groundwater. The Client Or others specified the scope of the investigation And the validity of our conclusions is limited by the scope of work specified. We are Not responsible for any such limitations Or omissions.

Where stated in this report, we have used information supplied by third parties. While we have evaluated As far As possible the validity Of this information, we cannot guarantee its accuracy In any way whatsoever.

No investigation technique is capable Of completely identifying all Of the contaminants that might be present In the soil Or groundwater under a site. Where specified In our report, we have examined the ground by constructing a number Of boreholes And/OR trial pits. We recovered samples Of soil And/OR groundwater from available exposures.

The depth And spacing Of our Sampling locations were selected To ensure With a reasonable probability that they would be representative Of the actual conditions across the whole site. However, safety considerations relating To existing site infrastructure may have restricted our ability To investigate all potential contaminant sources. Specifically, we were unable To investigate the soil And groundwater condition immediately adjacent To the underground structures And/OR buried services. These limitations must be borne In mind When considering the conclusions reached In this report.

Soil is intrinsically variable And the spread Of contaminants within the soil is therefore subject To a degree Of non-uniformity. For these reasons no sampling technique can completely eliminate the possibility Of obtaining samples that are Not representative Of the actual conditions. Our sampling techniques are intended To reduce the possibility To an acceptable level, within the limits imposed by the scope of the investigation.

Groundwater levels And soil vapour levels that we report were accurate at the time of the investigation. Groundwater And soil vapour levels are variable. Long term monitoring may be required to ensure that the levels recorded during our investigation are representative of long term And possible 'worst case' conditions. In accepting our recommendations and/or conclusions the Client acknowledges that further, more detailed investigation would allow a more accurate assessment of site conditions to be made and that this would reduce any consequential risk to the Client.

Our investigation was carried out to assess the significance of contamination resulting from use of the site as identified in this report. Unless we have indicated otherwise, no assessment of the potential impact of any other previous uses has been made. No investigation was carried out to determine whether or not any deleterious or hazardous materials (such as asbestos) have been used in the construction of the buildings present on the site. Unless otherwise stated no investigation or assessment has been made of the presence or otherwise of invasive plant species including but not limited to Japanese Knotweed.

Unless specifically stated otherwise, we have not assessed the effect of any proposed future construction activities on existing structures on or near to the site. Nor, unless stated otherwise, have we assessed the likely effect of trees on existing or proposed structures on or near the site.

We do not accept any responsibility for the cost of remedial works or other costs incurred in whatever way whatsoever as a result of any omissions, errors or other shortcomings in this report unless we have been given reasonable opportunity to verify ourselves that such faults exist and we have been given a reasonable opportunity to carry out works to remedy such faults ourselves using the most practicable means available to us. We do not accept liability for any consequential losses incurred by you while either we or others carry out any remedial works we deem necessary.

This report has been prepared for the Client, as specified on the cover page of this report. In accepting our recommendations and/or conclusions the Client accepts that the terms of our appointment were as detailed in the Proposal, or Proposals, that we provided to the Client before being appointed and that these terms supersede any other terms and/or conditions set out in any contracts agreed between ourselves and the Client, regardless of when such terms and/or conditions were agreed to by us and/or signed by us.

Use of, and reliance on, this report by other third parties will be at such third parties own risk, and we do not accept any liability or responsibility to them.

Neither the whole nor any part of this report, or any reference to it, may be included in any published document circular or statement or published in any way without our prior written approval.

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Client: BP Oil UK Limited

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