

Application Ref: 6/2022/1097/OUTLINE

Response to Natural England

**Addendum to Ecological Appraisal Report (Liz Lake Associates,
March 2022)**

**LAND TO THE NORTH OF BRADMORE WAY, THE BROOKMANS
PARK ESTATE, BROOKMANS PARK, HERTFORDSHIRE (BRP12A)**

**ASSESSMENT OF WATER QUALITY IMPACTS ON WATER END
SWALLOW HOLES SSS1**

ON BEHALF OF AURORA PROPERTIES (UK) LIMITED

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Introduction

This response statement aims to address the concerns of Natural England (NE) set out in their letter of 14.6.2022, regarding the potential for surface water drainage arising from the Brookmans Park residential development (6/2022/1097) to damage or destroy the interest features for which Water End Swallow Holes Site of Special Scientific Interest (SSSI) have been notified.

NE has requested further information in order to determine the significance of these potential water quality impacts and the scope for mitigation, which we are now submitting as an Addendum to the original Liz Lake Associates Ecological Appraisal Report (March 2022), and also to expand upon the information provided in the '*Land to the North of Bradmore Way, The Brookmans Park Estate, Brookmans Park, Hertfordshire Flood Risk Assessment*, April 2022, Wallingford HydroSolutions.

The SSSI is notified for its geology / hydrology, as it consists of a series of more than 15 sink holes that feed straight into the groundwater. It is therefore essential that any water is of good quality when it reaches the designated site. The willow carr / swamp community adjacent to the sinkhole is of biological importance, including areas of semi-natural woodland, scrub and semi-improved grassland with stands of reed sweet-grass, great willowherb, meadowsweet, and water plantain in more silted areas. The more stable ground is dominated by willow and hawthorn, with a ground layer of lesser pond sedge, bulrush and yellow flag. Whilst reasonably widespread and robust, these habitats, given their protected status, should not be subject to inflow of water of quality lower than that currently occurring in the inflowing water course.

Specifically, NE have requested an assessment of potential water quality impacts on the Water End Swallow Holes SSSI and have asked WHBC to reconsult with NE once the information has been obtained. There follows in this addendum to the submitted Ecological Appraisal Report, further discussion, assessment and scope for mitigation with a view to providing assurance that the proposed development will not exert adverse impacts on the special interests of the SSSI.

Assessment of Water Quality Impacts on the Water End Swallow Holes SSSI

The scheme proposals make allowance for surface water drainage from the proposed development to be received by a SuDS attenuation pond (ref. *Land to the North of Bradmore Way, The Brookmans Park Estate, Brookmans Park, Hertfordshire Flood Risk Assessment*, April 2022, Wallingford HydroSolutions), located in the SW part of the Site.

The attenuation pond incorporated into the drainage design will provide treatment for the surface run off before it is discharged into an existing watercourse within the adjacent Peplin's Wood. This watercourse flows in a westerly direction towards the mainline railway line, through a piped culvert of diameter 700mm under the railway embankment, located approximately 100m north of the existing settlement edge (see Photo 1 below) and from thence in a westerly direction towards the SSSI. If left untreated any surface water drainage from the proposed development could have significant water quality impacts on the receiving waters and habitats of the SSSI.

Photo 1. Piped culvert conveying the Peplins Wood watercourse under the railway embankment



Whilst the closest part of the SSSI is approximately 300 meters to the west of the Site, it appears that the first swallow hole occurs some 300 metres further to the west, with the main cluster of swallow holes located in the western part of the SSSI at Water End, approximately 1km to the west of the Site. The SSSI extends between Station Road at its eastern end and Warrengate Road / Swanland Road (close to the A1(M)), with residential and commercial premises at Water End, at the western end of the SSSI. Thus, there is some distance between the source of the surface water runoff and the receiving waters of the SSSI and the swallow holes in particular. If left untreated, there is potential for pollutants derived from the surface water drainage from the Site, albeit diluted in the stream and deposited along the route to some extent, to enter the SSSI. However, the specified attenuation pond and associated features has been designed in outline to address this potential issue and will be further refined and adapted, as much as is necessary, to ensure that there is no unacceptable risk that discharge from the site leads to a deterioration in water quality at the notified site.

At this outline stage, as is usual, design of the attenuation pond remains subject to final detailed design and additional information will be specified and agreed at the reserved matters stage, subject to the obligations in any planning condition. Notwithstanding this, the Wallingford HydroSolutions report demonstrates that the proposed attenuation pond meets the required criteria in the index approach set out in the CIRIA SuDS guidance. The Site uses are associated with a low pollution hazard level and the proposed drainage strategy provides adequate treatment for surface water discharge ie the SuDS provide a total pollution mitigation index that exceeds the pollution hazard index, in respect of total suspended solids, metals and also hydro-carbons.

The design and specification detail provided at this outline planning application should therefore provide sufficient confirmation that the attenuation pond can be fully delivered to the satisfaction of the Lead Local Flood Authority (LLFA).

However, in this respect, and in order to ensure that the proposals will also satisfy Natural England, additional surface water drainage measures are set out below that would be implemented at the detailed design stage. It is submitted that in combination,

these measures provide sufficient assurance that the design of the attenuation pond and other associated features will provide an appropriate and effective package of mitigation measures (formulated in liaison with Wallingford HydroSolutions). These include monitoring, containment and treatment of the surface water runoff (including fuels, dissolved hydro-carbons, contaminated sediments and other pollutants) from the proposed roads and other hard surfaces within the residential scheme, before it is discharged into the water course that eventually feeds into the SSSI:

- The pond will be designed to include **reed bed habitat to provide effective natural filtration / contaminant digestion, significantly reducing the quantity of potential pollutants** that might enter the pond. The reed bed will be located between the inflow and outfall to maximise the extent of filtration as water flows through the pond.
- There is scope to install an **additional swale feature in the wildflower meadow leading into the pond**, to effectively extend the surface area of reed bed habitat available for filtration.
- There is also scope to create **a further shallow scrape within the 15m+ buffer zone** beyond the outfall, between the attenuation pond and the woodland, planted with willow and other high water demanding species, to absorb any overtopping of the pond (only predicted when a 1 in 100 year + 40% climate change allowance is exceeded).
- The pond will include **a quiescent zone** (ie normally non-moving) which enables the inflowing water to be retained as still water, allowing finer sediments and dissolved pollutants to settle as silt in the bottom of the pond, preventing their discharge via the outfall into the receiving water course.
- The drainage system will incorporate **pre-discharge oil and petrol interceptor tanks** and other additional and appropriate treatment components, sufficient to accommodate an unexpected pollution / spill event (to be specified at the detailed design stage).

- Water levels within the pond will be designed (in association **with 2 proposed underground attenuation tanks via a silt trap chamber**) to provide an appropriate level of dilution during a pollution accident and allow for oil separation and retention. In the event of a significant pollution event, there is scope for the flow control mechanism to contain the surface water within the attenuation tanks, treat / remove the polluted water in-situ and prevent inflow to the attenuation basin.
- The attenuation pond will be fitted with a **Vortex Flow Control Device at the outfall**, this will regulate discharge [maximum discharge flow rate of 49.43L/s] into the receiving watercourse. The use of **additional structures / chemical pollution control / oil spill containment measures** including permanent and/or temporary floating absorbent booms for oil spills, will also be implemented if necessary and agreed with the LLFA and LPA.
- Due to the topography of the land and the raised level of the East Coast Mainline Railway, the **existing culvert under the railway embankment acts as a dam to surface water on the eastern side of the railway line** (and this would include outflow from the proposed development site). This effectively regulates flow and capacity under the railway line and towards the SSSI to the west of the railway lines.
- If required, there is scope to provide additional mitigation at the regulatory position associated with the culvert or elsewhere, by means of **installation of monitoring and trigger devices**, including penstock gate and flap valves to secure spills and prevent pollution passing further downstream, thus preventing water quality impacts on the SSSI.
- During the construction of the proposed scheme the quality of surface water runoff will be managed through the specification of appropriate mitigation measures in a **surface water management plan**, which will be developed during the detailed design of the scheme. This will include but not limited to; measures to prevent silt and sediment runoff into the watercourse, working methods to minimise the risk of

accidental spillages occurring, plans to ensure the containment and clean-up of any spills, designation of appropriate areas for the vehicles plant machinery and equipment washout, and designation of specifically designed storage areas for the storage of any fuels and chemicals within appropriately specified containers onsite.

It is acknowledged that in order for the surface water drainage scheme associated with the proposed Brookmans Park development to be considered viable, it is necessary to demonstrate that any surface water drainage derived from the Site must not lead to a deterioration in water quality in the receiving waters of the SSSI.

In terms of alternative additional sustainable solutions that could be implemented at the Site to ensure that the quality of surface water discharge from the residential scheme is maintained free of contamination and as noted by Hertfordshire County Council (HCC) (letter of 8.4.2022, Francisco Aguilar) additional measures over and above the existing proposed, can be implemented at the detailed design stage and these would further protect the downstream SSSI from the risk of site derived pollutants adversely affecting water quality in the notified site. For example, HCC note that ‘a SuDS management train formed by bio-retention systems, permeable pavements and a detention basin is being proposed to manage water runoff’ and makes recommendation that ‘we would encourage you to maximise the storage volume provided in permeable pavements at the detailed design phase, in order to manage runoff throughout the site rather than just with the pond’. Whilst it is unlikely to be viable to implement a scheme of infiltration on any significant scale (due to low permeability of the substrate and the site being located within ground water protection zone III), there are other alternative options.

The applicant has a significantly wider land ownership which extends to the west and the north of the application site, such that additional surface water control and management could be achieved if necessary. For example, if the LPA stipulates that an additional treatment component (ie over and above that required for standard discharge) is required, similar to discharge into surface waters designated for drinking water abstraction, in order to assure protection of the SSSI, then this can be achieved.

We hope that this additional information is sufficient to satisfy the concerns of Natural England regarding the potential for adverse effects on the Water End Swallow Holes SSSI, but we would be happy to enter into further discussions if this would be helpful.

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