

**Comments on the additional submission for Planning Application No 6/2018/2768/OUTLINE to build 1100 homes in Ellenbrook Fields, by Hatfield Town Council**

**Strong Objection**

This submission is on behalf of Hatfield Town Council and has been informed by the submission by Ellenbrook Area Residents Association for which the Council is very grateful for their expertise in various subjects.

Members note that addendum have been added to the Environmental Impact Assessment on the following air quality; ground conditions and contamination; Water resources, flood risk and drainage and ecology and we have the following comments to make;

**1) The Bromate Plume, and land contamination**

The application site is over an area which is contaminated by a bromate plume. It has been acknowledged and recognised that the bromate plume presents a high risk to the source of our drinking water and that despite 10 years of attempted remediation actions by the Environment Agency it is proving extremely difficult to manage to reduce concentration in the ground water, in Hatfield . in fact the concentration at Bishops rise had not been reduced at all, by 2018 and so a new remediation plan is being proposed to try and manage the worst pollution of a chalk aquifer ever seen in Europe.

For these reasons we agree that a zero risk strategy should be adopted for the plume and any activities which could disturb the plume should not be allowed on or near the path of the plume. The risk of diverting the plume path towards any water source should not be taken.

The proposed development site crosses the highest levels of bromate contamination in Europe. Levels in excess of 1000µg/l have been detected by the Environmental Agency (EA) in this site area.

This contamination of the underground chalk Aquifer (water bearing chalk) means that water from wells or any water from the Aquifer in that area , must not be consumed. The maximum level of bromate in drinking water has been set by the World Health Organisation at 10µg/l (standard set in 2000) .

Any disturbance to the ground near the polluted aquifer may spread the contamination in different directions affecting and polluting other groundwater, which will be catastrophic for Hatfield . This could contaminate the upper water course, and flow to Rostock and Tyttenhanger Water pumping stations which are currently the sources for our drinking water. This application will undoubtedly affect the height of the water table over the entire site.

The bromate has already affected and therefore closed the Hatfield Water pumping station at Bishops Rise, and has affected the Essendon bore hole, which is monitored closely and as we understand is shut down occasionally when the level of bromate breaches World Health Organisation guidelines. This development can only raise the risks to local groundwater pumping stations becoming contaminated.

The Environment Agency have placed an objection to this application because “the risks to groundwater from the proposed development are unacceptable”. These risks include the

bromate and bromide pollution under the site and the potential contamination due to the previous use as a commercial and military aerodrome.

These issues are clearly recognised by the expert body and as mentioned above we believe that a ZERO risk strategy must be adopted for this regardless of any mitigating actions the developers may choose to adopt or implement, none of which will give a 100% guarantee.

We therefore remain concerned about the impact of any development on Ellenbrook Fields that may further jeopardise the source of drinking water. Once the water is contaminated then it is too late.

#### Technical Evidence to support Objection - diagrams and maps

The map below shows the known contamination on Ellenbrook Fields and on this site, with contamination in excess of 1000µg/l. **One hundred times the World Health Organisation limit.**



- That the planning application has not considered NPF rules on **Ground conditions and pollution** in paragraph 178:
- The applicant has not supplied adequate information to demonstrate that the risks posed to groundwater can be satisfactorily managed.
- That the application does not address vertical infiltration of groundwater into the underlying principle aquifer, thereby influencing movement and cross contamination of the aquifers.

EA objection.

*We anticipate that the aspects of the proposal that could potentially mobilise shallow contamination and/or affect the groundwater are:*

- *construction activities (including foundations/piling/services),*
- *infiltration drainage of surface water from roofs and areas of impermeable hard standing,*
- *sewerage,*

*interference with groundwater monitoring and mitigation measures for adjacent/overlapping sites.*

- that there is no mention of “adjacent/overlapping sites” such as the proposed Brett quarry to the East. Attenuation lakes practically touch Infiltration lagoons in a specific area - a catalyst for cross-contamination ...see fig 3.

“Boulder clay in the area has a mean thickness of 4.3 m, ranging in thickness from 0.9 m in 20 NW 17 to 8.8 m in 20 NW16.” *Institute of Geological Science. Mineral Assessment report 67. J.R. Gozzard.*

- that the interburden (clay barrier) is the only protection of the primary and secondary aquifers. The clay interburden thickness is cyclic in nature and does not give adequate protection to the underlying primary aquifer.

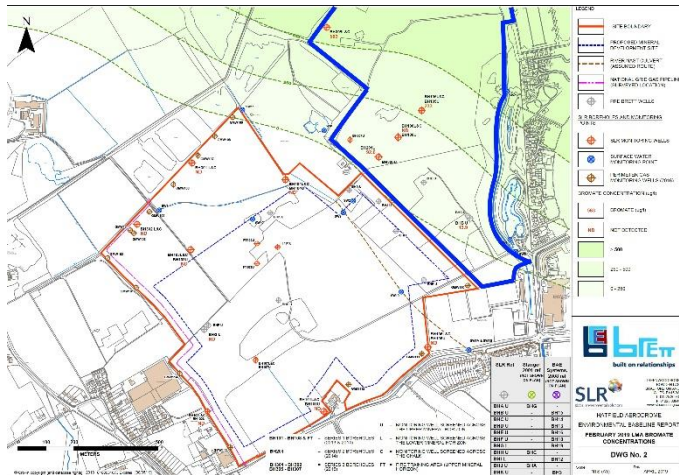
Our objection is that a thorough investigation of the site has not been achieved:

- Insufficient boreholes sunk to determine the depth & thickness of the interburden and the depth of chalk aquifer – only three boreholes CP001/3/2 are sunk to a depth of 6 m, 12.5 m, 14.5 m below ground level. These boreholes are of insufficient depth to monitor bromate & bromide.
- The two Environment Agency boreholes 80163A05 & 80163A23 are located on the west side of Ellenbrook Fields, the bromate levels are extremely high at 808 & 1020 µg/l recorded in 2017.
- Test samples for bromate & bromide have not been sampled at all geological strata levels. The plume has not been analysed correctly due to insufficient depth, and a laboratory measurement problems below 100µg/l of bromate.
- A conceptual map has not been drawn up of the plume of contamination across the whole site.
- Lack of clarity about the contamination plume under the site – none of the documents show the extent and mapping of the plume. The first document Statement on ground conditions Hydrology & Contamination published in 2018 did not mention **bromate** in or under the site.

*Baynham Meikle & RSK Environment Ltd.*

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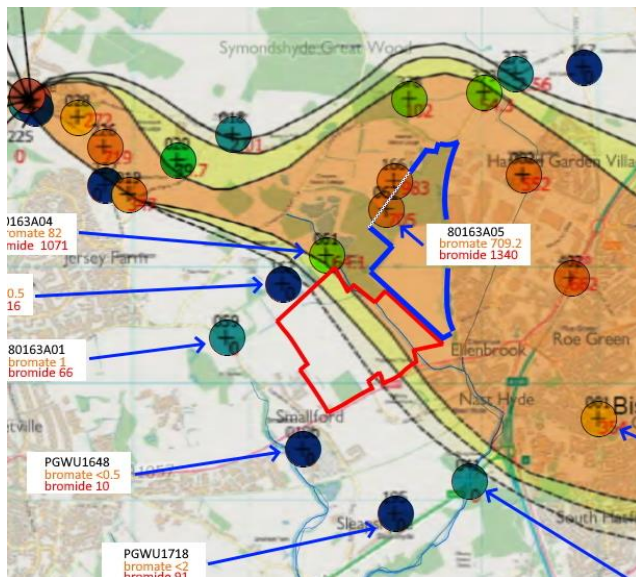
The latest plume drawing from Hatfield Quarry Application. Over 500µg/l (green) in the North where the planned housing would be:



This map was produced for the quarry application and shows the bromate contours under the housing site (dark green). The blue shows the southern part of the housing application.

Fig 1

EA plume drawing showing boreholes and housing applicant site. Borehole 80163A05 @ 709.2µg/l bromate is to the West of the housing site.



The EA map is expanded from Part 2A of Environmental Protection Act 1990 St Leonards Court document showing greater than 50µg/l bromate in light red. The site is in the middle of the plume. To the South is the Brett quarry application in red outline.

Fig 2

The site chosen for housing is the most polluted in Hertfordshire, and in direct line for remedial work at Bishops Rise pumping station. Any change in the direction or mobility of the plume could impact on water supplies at Essendon and Roestock. This is why it is important to avoid interference to the chalk aquifer by industrial action such as digging, piling and flooding the secondary aquifers.

## 2) The Flooding Risk

A proportion of the site is classified as high risk for both groundwater and river flooding, it is clear from the photos submitted by EARA, and other evidence from the flooding authority that there is a significant flood issue that can only become exacerbated by this development.

Flooding at the location on the actual development site is a common occurrence. To suggest that flooding will not be a problem when large areas of permeable land will be replaced by concrete drives, roads and housing in an area, already blighted with flooding is not sound.

Historically the whole site has a flood problem, with the land sloping towards the South East, i.e. towards the Ellenbrook area, the highest point being @ 80m ASL (Above Sea Level).

The only river carrying this water is the Ellenbrook; it rises at Astwick Manor flowing in a southerly direction, through balancing ponds then under the A1057 roundabout (74m ASL) to meet the river Colne. The area along its banks is already classified as a flood risk. The development will increase the risk of flooding with extra rainfall run-off and drainage. RSK have estimated that the flood risk will increase from 10% to 80% flood risk.

The Two large lagoons, and the proposed "attenuation ponds" are sited too high up and too close to urban housing and the University. Given the amount of rainfall "run-off" which will no longer be able to soak away through permeable grass, and the nature of clay soil in the remainder of the area - it is likely pond will overflow, if this development were to take place.

This poses a potential flooding threat to anything downstream on the Ellenbrook and Nast river streams, these low-lying areas are already designated Flood Zone 1 status. The Nast becomes a discharge point for these lagoons.

The proposed new development will contribute to flooding in low lying areas near the University, A1057 roundabout and along the Ellenbrook River - this will occur because the vegetation that normally absorbs surface water will be removed. Concreting over such a large area of land for housing and therefore significantly reducing the permeable area available will only exacerbate this issue and put the area at a greater risk of flooding. Surface rainwater and drainage from housing will eventually find its way into the Ellenbrook river system and potentially cause flooding in the Ellenbrook area.

The proposed mitigation to reduce the risk that this development poses to the bromate pollution plume involves moving the groundwater runoff towards the southern edge of the site. This effectively further increases the risk of flooding in this area.

Currently the site is covered with grassland and as such a significant amount of rainfall currently infiltrates into the ground with runoff likely to be as little as 10%. Assuming that the geology is relatively consistent across the site the effective rainfall is likely to be relatively uniform across all areas of the site.

With any proposed development where areas of hardstanding and buildings are introduced it is inevitable that this will affect the infiltration characteristics of the site with surface runoff rates increasing significantly in some areas (estimated to be up to 80% or so by RSK).

The management of surface water runoff from buildings and hardstanding typically involves channelling of the water to attenuation features, such as basins and soakaways sometimes utilising deeper borehole soakaways into permeable aquifers.

It is recommended that a **conceptual understanding** of the area of the attenuation basins be developed following an investigation of the ground and hydrogeological conditions in their vicinity.

Arlington Business Parks Partnership 15  
Phase 1 Desk Study: Land West of Hatfield Business Park  
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- Our objection is this “conceptual understanding” has not been completed before submitting this planning application.
- Groundwater from a mixed housing site is shown to be removed from the site by a mixture of swales and attenuation lakes. These ponds and lakes are situated in the south of the site where it is believed the underlying plume of contamination is lower. The objection is that lateral flooding due to these lakes overflowing will impact on housing, the University-halls of residence for 2000 students and sports village; Ellenbrook residents, the A1057 and roads to the south of the application site.

“A review of the potential **cumulative effect** on the water environment considering known projects in the vicinity.”

Ref chater 13. *Water resources flood risk & drainage*

- The cumulative effect of attenuation lakes in the South and Brett quarry infiltration lagoons in the same area was not taken into consideration Fig 3.

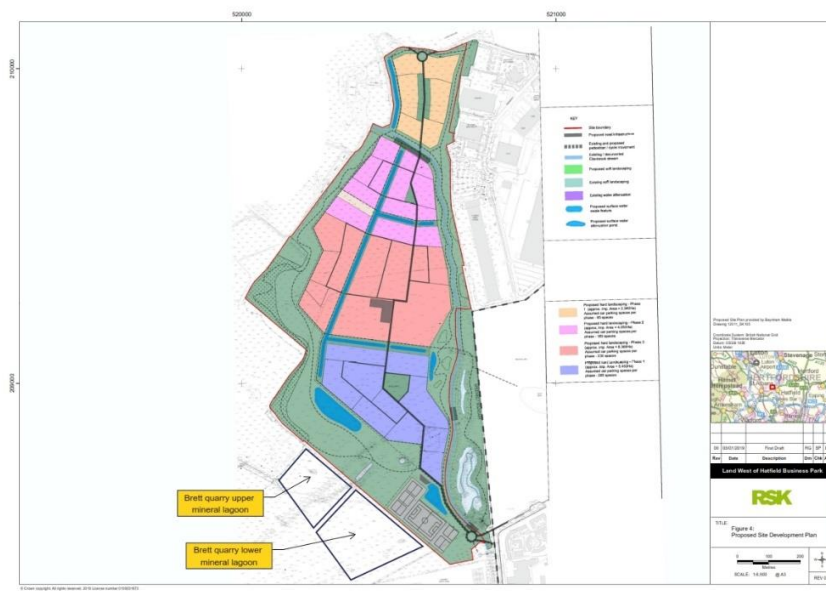


Fig 3

Fig 3 shows proposed Brett quarry lagoons in the South. The expected infiltration rate of the Upper Mineral Horizon is estimated at 1,100 to 2,300 cubic metres/day directly into the same ground that the attenuations ponds (blue) would add another 1000 to 2500 cubic metres/day, from the run off from the new development.

These totals double the groundwater amount, which is now focused on a specific area potentially leading to flooding downstream of the combined sites.

Other Technical Evidence

### 3) Infiltration drainage

Infiltration from surface through to the underlying aquifer, specifically the contaminated groundwater present within the granular Lowestoft Formation are considered to be a significant risk presented by the potential development of the site. It is understood that while the bromate and bromide contamination within the underlying aquifer has not originated on site, its concentration within groundwater is directly affected by disturbance and increased flow. As such the development has the **potential to concentrate flows** of water to specific areas of the site such as the attenuation basins. Water would then drain through these at a significantly high rate causing increased mobility of the contamination present.

- The objection is that the “development has the potential to concentrate flow” and “causing increased mobility of the contamination present” that is bromate and bromide.

### 4) Permeability

Based upon the results of the soakaway tests undertaken, all of which returned noncalculable results due to the **slow rate** of infiltration, the ground conditions appear do not appear to be sufficiently permeable to allow for **rapid infiltration** of surface water into the ground. It should be noted that soakaways conducted in TP055, 056 and 059 were undertaken within the footprint of the proposed attenuation features for the site. This is supported by the laboratory permeability tests undertaken on three samples of cohesive Lowestoft Formation soils which revealed laboratory permeabilities of between  $3.3 \times 10^{-11} \text{m/s}$  and  $2.1 \times 10^{-10} \text{m/s}$ .

“therefore vertical migration or leaching is unlikely. Instead, **lateral migration** from the attenuation ponds into nearby surface water features is probable. Reducing the risk of groundwater influx into the chalk aquifer which enable mobilisation of the bromate plume”

RSK phase 1 Desk Study

- The objection is that the soakaway is extremely slow and attenuation lakes will not allow rapid infiltration of the groundwater. An overwhelming lateral migration of groundwater may lead to a potential flooding crisis event.

### 5) Gas on site

Due to the various infilled ponds and infilled ground on site and the neighbouring landfills to the south west and west, there is a fairly significant source of ground gas to the site.

- The objection is that “migration and potential accumulation of ground gases, creating explosive or asphyxiating atmospheres” has been found on the site caused by infill material at quarry works near to the west of the site – The CEMEX quarry.

## 6) Piling, and building methods -not compatible with risks to groundwater

Given the presence of a contamination plume within the underlying groundwater, into which piles are likely to penetrate, some piling techniques may not be considered acceptable. Additionally, care needs to be taken to prevent preferential pathways to be formed between the surface and the groundwater beneath the site.

- The objection is that piling is a high-risk activity and inclusion into the Lowestoft Formation could open vertical pathways into the lower aquifer allowing migration of groundwater.

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### EA remedial plan for the area

ST LEONARD'S COURT  
DECISION DOCUMENT  
PART 1  
Environment Agency  
July 2019

130. Report D at paragraph 2.7 included a further array close to Hatfield Quarry, known as Group 2 and shown in Figure 1 of the report. This location has the advantage of boreholes forming an arc across much of the width of the plumes. The Environment Agency accepts that there may be some practical difficulties such as the current distance to a suitable sewerage system, but this site and Hatfield Quarry has many advantages, including land availability and current groundwater abstractions, which may provide information on aquifer properties in the vicinity, and could be a site for much needed remediation (ref).

- The objection is that the EA remedial plan using an array of boreholes, perpendicular to the plume and at its highest bromate levels, would require an area to operate that is clear of obstacles and housing.

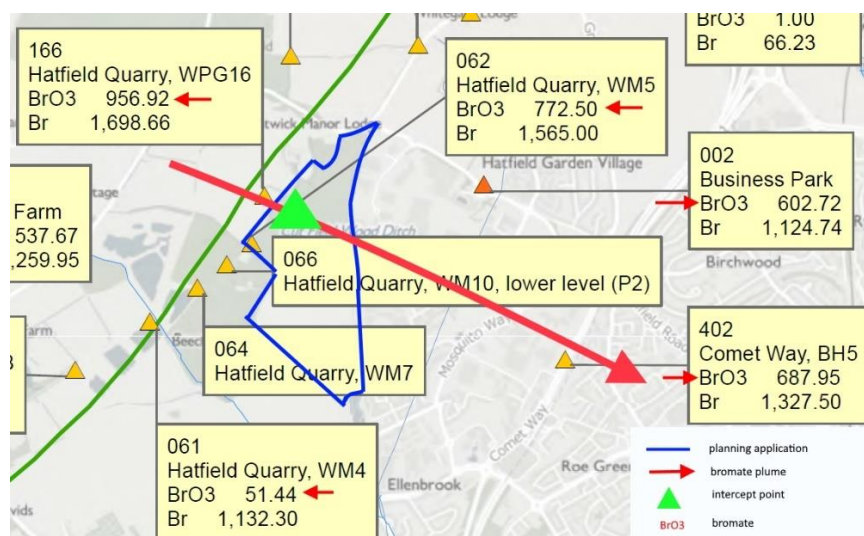


Fig 4

The intercept point is shown in green. The plume has a S.E direction.



## **Summary**

This strong objection from Hatfield Town Council is addition to previous objections submitted by this Council in 2018 and supports other objections submitted by Ellenbrook Area Residents Association, numerous other Hatfield residents, the Environment Agency and HCC in 2020.

This is in addition to the concerns raised previously regarding failure to create and maintain the Ellenbrook Park Preservation Trust and to develop this land as a Park, for the population of Hatfield, in its entirety, which was required under previous s.106 Agreements in 1999 /2000 with the same developer. This development progressing would constitute a breach of the promises made in 2000, when permission for the Salisbury village and Hatfield Garden village was granted .

This site also lies within the Green Belt and the proposal would contribute significantly towards the loss of required Green Belt land separating Hatfield and St Albans, without any 'very special circumstances' existing to permit this potential harm to the Green Belt.

It is noted that this site is not recommended in the Local Plan and we consider that it will create over development of North West Hatfield.

Thank you for considering this objection on behalf of Hatfield Town Council