

HAVANT BOROUGH COUNCIL

Town & Country Planning Act 1990

Consultation on Planning Application

MEMORANDUM

From:	Environmental Health	To:	Development Control
Our Ref:	CONS/18/00730	Your Ref:	APP/15/01233
EH Case Officer Extn:	46677	Date:	04 Jan 2019
DC Case Officer:	Ms R Ballam		
DC Case Officer Extn:	46143		
Application Number:	APP/15/01233		
Site Address:	Street Record, Fulflood Road, Havant		
Proposed Development:	Erection of approx. 1,920sqm of Warehouse, 890sqm of office space and a 220sqm training school facility with associated enclosed loading areas, car parking and refuse storage (approved 24.1.16). Request to Discharge Conditions 5 (Contamination Assessment, and Risk Mitigation)		

Observations / Comments:

I have reviewed the Structural Soils Ltd. Interpretive Report on Ground Investigation Ref 733845-1 rev.01, submitted in support of the application to discharge all parts of condition 5 to consent no. APP/15/01233.

c.5 - Contamination Assessment – critical appraisal

The scope of investigative works and sampling suites selected have been designed to address the gaps in knowledge about the site, and to specifically target the potential pollutant linkage which concerns the impact that the site may have on the adjacent Controlled Water (Riders Lane Stream, classified as a statutory main river).

The advice of Environmental Health was sought prior to the works, and the design has accounted for comments offered.

The report serves to robustly dismiss a number of risks that might otherwise have been plausibly inferred given the history of the site. Most notably, results for PCB, VOC's, MTBE & BTEX group compounds were all universally below the laboratory limit of detection. This either rules out-, or strongly suggests that a number of the potential sources which could have contributed to the hydrocarbon results (identified previously) are unlikely to have materially impacted soils at the site, and (therefore) that common sources are more likely.

PAH concentrations in soils are remarkably low given the prevalence of trace hydrocarbon contamination across the site, and the relatively common occurrence of macadam / bitumen, clinker, ash, coal & slag within made ground. One water sample from WS3 contained concentrations of Benzo(a)Pyrene several orders of magnitude in excess of it's respective EQS (Annual Average, EQS AA), though not exceeding the maximum allowable concentrations (EQS MAC).

In general / conceptual terms, the report postulates a 'dilution response' whereby contaminants are less likely to be identified in sampled wells following rainfall. This is an interesting observation, but can only be regarded as 'tentative' at this stage as it is based upon a very small dataset (3 sampling rounds).

As rainfall (percolation, & lateral movement of groundwater) is expected to be the primary mode of contaminant mobilisation, it could be true that conditions of high groundwater serve to both mobilise contamination from soils, and at the same time to 'mask' the likely volume liberated by diluting the sampled concentration. Conversely, this observation may suggest that the groundwater is escaping the site, but the movement of contaminants themselves is being retarded by the soil matrix – or that wells tend to act as sumps under low-groundwater conditions, and that sample results under these condition may over-represent concentrations in groundwater.

A reasonable interpretation of the facts of the report could be summarised as:

1. Residual Contamination exists at the site, which appears to be predominantly associated with a source local to the site. Significant migration of contamination from an off-site source has been shown to be unlikely.
2. Multiple potential sources of soil contamination exist on-site, and no one source has been shown to be likely to represent a coherent bulk mass of contamination.
3. The (shallow) groundwater at the site acts as a single unit, with hydraulic continuity between Made Ground/Head/Bognor Sand deposits, and within the softer / variably permeable upper horizons of the London Clay.
4. Site Groundwater is likely to be hydraulically contiguous with the Riders Lane Stream, albeit that levels data suggests that the flow may be impeded to a degree by the presence of the concrete retaining wall at the South-eastern boundary.
5. Groundwater at the site is impacted by contamination present somewhere at the site. No bulk soil source has been specifically identified, and aliphatic/aromatic splits suggest distinct sources (at least 2 different predominant parent products). Soil concentrations are lower than might be expected given the indications of free product in ground water samples. Peak hydrocarbon concentrations in groundwater are consistent with previously recorded maximums, but these concentrations are generally inconsistent with soil results (with the possible exception of TP9) – this suggests mobilisation from a nearby source (on site) that has not been characterised to date.
6. Results from the region of TP9, DTS06/DP05, WS1 & WS4 suggest either a source local to the Southeast of the site (south of a line between TP15 & TP4), or (with reference to DTS04 results & black 'mottling' at TP12), a tendency for contaminants to migrate in this direction – possibly toward a the surface water service pipe (granular bedding material) which may be acting as an outlet to the retaining wall which is thought to impede groundwater flow.
7. Surface water samples (taken from the Riders Land Stream) suggest that the site might be impacting the water quality within the river channel, but samples taken upstream of the site also confirm that upstream sources of pollution are also affecting water quality. Results from locations up- and down- stream of the site are not sufficiently different as enable a confident conclusion of 'actual material impact' (of the site); there were insufficient results to run a max. value test, but the results from SW2 do not qualitatively stand out as probable outliers.
8. Principle contaminants of concern in relation to the Surface Water are represented by Aliphatic C6-C8, TPH (C12-21), Benzo(a)Pyrene, Nitrite (NO₃), and Dissolved Copper, Lead, Chromium and Zinc. TPH C12-21 exceeds theoretical solubility and sheen was noted on groundwater - so free product is likely to exist on site. All of the other compounds exceed a corresponding EQS value which applies at the receptor.

9. The Pollutant Load at the Riders Lane Stream is evidenced by elevated Nitrite, Aliphatic C6-C8, Copper, Chromium, Lead, Nickel & Zinc – of the metals, only Nickel falls consistently below its respective EQS. Nitrite concentrations also exceed the relevant EQS.
10. Concentrations are elevated both up & downstream of the site, however (given the above), it is reasonable to conclude that this site is contributing to the pollutant loading of the Riders Lane Stream.
11. Ground gas screening values correspond to Characteristic Situation 2, but maximum concentrations of Methane exceed 'typical maximums' for this classification on general made ground.

The above summary (1-12) indicates that there is likely to exist a volume of contamination impacted soil at the site (or in respect of hydrocarbons potentially another source, e.g. leaking pipework or sump which remains in situ); and that the contamination is being mobilised from this 'parent' source to groundwater. Olfactory evidence suggests a degree of volatility and liberation of hydrocarbons to the vadose zone, visual evidence suggests a degree of retardation / retention through sorption to soil particles. Soil gas results indicate a degree of biological degradation. Water levels results suggest that the retaining wall is impeding groundwater flow, and both concentration distributions and SW2 results can be taken tentatively to suggest that there is a preferential release point which is allowing contaminants from the site to enter the surface water.

The report acknowledges both the limited permeable surfacing at the site, and the limited total soil concentrations identified to date. Despite this, the primary conclusion is that the limiting of within-site infiltration is the most appropriate risk mitigation measure. This is likely to be true to a degree in respect of metals (and perhaps also PAH, B(a)P), which are not unlikely to be leaching from made ground. However, made ground now forms a contiguous part of the aquifer, and hydrocarbons at least appear to be generally coincident with the typical groundwater levels. Given that the local source of hydrocarbons has not been identified, its depth is not known. It cannot (therefore) be known whether vertical percolation or lateral migration is the predominant mode of mobilisation, and therefore whether limiting infiltration (within-site percolation) or lateral migration (off-site percolation, and natural groundwater flow), or both, would be necessary in order to break the pollutant linkage without removing or treating the source.

c.5 - Contamination Assessment – Conclusions

The results presented have been carefully considered. I am not entirely convinced that simply limiting infiltration on site will serve to substantially limit the contamination mobilised from the site – though it should be noted I do accept that the permeable drainage, not being designed to be an infiltration solution does, serve to limit infiltration.

That a source of contaminants exists at the site now appears relatively clear – though it remains unclear as to what scale and volume that source might represent. Hydrocarbons in particular appear to be found at depths broadly consistent with groundwater surface (or more accurately, in close proximity to horizons of permeability change); where lateral movement is likely to be an important mode of transport and migration, and where off-site percolation may represent a significant, if not the predominant- hydraulic driver.

I find the presented model for nitrite release from the site to be largely plausible, and would agree that the proposed diversion of the foul sewer line is likely to reduce leakage from joints / deformed pipework, and may result in betterment by limiting a source of nitrogen / nitrates / nitrites and ammonia (and phosphorus).

I am mindful however that the former wastewater treatment works, and soils / deposits associated with it are a similarly plausible source, and that elevated nitrite has been identified in

groundwater up-hydraulic-gradient of both of these potential sources. Conceptually (therefore) there is low confidence in the model for this pollutant linkage. It is unclear whether the model for this linkage is inaccurate or incomplete, but it is difficult to see how it could be both given the results which appear anomalous to it.

It would appear that the conceptual model allows for the site to be contributing to pollution of the Riders Lane Stream, and results are consistent with this conceptual model, if not being sufficient to be regarded as conclusive.

The report concludes that some incidental risk mitigation would result in a degree of site betterment, but no further targeted remediation is necessary (that the degree of harm identified is an acceptable degree of harm). The principle mitigation is limiting mobilisation by percolation, and this measure is not convincing in isolation given the current conceptual model for the site. The LPA must take a judgement on whether it agrees with these conclusions, accounting for the available information, general context of the site, and considerations of proportionality.

Considering enhancement of risk mitigation;

In order to prevent mobilisation by means of groundwater flow driven by up-hydraulic-gradient percolation; a vertical barrier would be necessary either at the up-stream site boundaries (to limit flow under the site), or at the downstream boundary (to prevent mobilised contaminants leaving the site). The cost of the former may be prohibitive relative to proportionality with to the risks and scale of development. In respect of the latter, the retaining wall already impedes flow – though it appears that water is able to ‘pass’. This presents a potential opportunity to enhance the existing barrier (e.g. by sealing free-drainage provision, and service penetrations), or to create a preferential point for groundwater to flow through this barrier, where opportunity might be taken to intercept & remove or treat contaminants.

A pure barrier solution risks ‘bypass’ to the South-west (assumed down gradient, due to topography and river flow) and may (therefore) not be effective. Sealing the free-drainage provision within a barrier of this height may also prejudice the long-term integrity of the structure, so an encouraged passage point with interception would likely be a preferred solution – though this may be necessity represent a long-term strategy.

Removal of on-site sources would likely fail any ‘proportionality’ test, and similarly any ‘sustainability’ criteria given the spatial distribution of contaminants, the depth of made ground present, and the generally low severity of identifiable soil contamination impact.

I am mindful of the sampling effort expended at the site, and that this effort has not to date identified a specific source of gross contamination. I am similarly mindful of the comparison between the up- and down- stream water sample results, and in particular the relatively poor quality of the water at this point in the river. The Surface Water is a main river, but is not a designated habitat. The closest downstream sensitive habitat is the Langstone Harbour.

For these reasons, I am minded to conclude that the site is contributing to the pollutant loading of the Riders Lane Stream, but is not likely to represent a ‘principle’ or ‘predominant’ source of pollutants. This being the case, and assuming that no specific contamination ‘hot-spot’ is subsequently identified at the site; the risk of harm posed by the site may be considered to be within the bounds of acceptability.

I would however recommend that:

- The “*vigilance during groundworks to the potential for previously unexpected contamination*” mentioned at 7.5 be formalised as a documented discovery strategy which includes a duty to report and address contamination identified, and

which provides for a post-completion (of groundworks) declaration in the event of no-declarable-discoveries.

- That basic gas protection mentioned at 7.5 be formalised as a 'remedial measure' subject to validation / verification.

The contamination discovery strategy will need to specifically define what is reportable, given the generally poor quality of soils at the site. For clarity, 'significant contamination' is likely to be represented by accumulations of hydrocarbons (e.g. in topographic 'hollows' in the surface of impermeable strata, or within deposits with locally increased porosity) as identified by moderate-strong hydrocarbon odour in soils, dark staining & hydrocarbon odour, or evidence of free product in soils / leachate (especially in pile drilling arisings), or on groundwater. Actions upon discovery might include some of those considered above.

The need to formalise gas protection for a commercial property where GSV's fall within CS2 is principally due to the relatively high peak concentrations of CO₂ & CH₄ identified, being mindful that gas monitoring represents a snapshot of ground conditions (only), the gas regime has not been robustly characterised, and that groundwater flows may drive gas release even where gas-generation pressures are insufficient to drive significant quantities into buildings or service voids. Due to the risk of fire originating from accumulation of flammable gas within service voids, it is considered prudent to proceed with a scheme of basic protection.

Accordingly, I would recommend that c.5 parts 1 & 2 be discharged, with other parts remaining in force pending submission of a description of proposals for basic gas protection measures, and a summary of the evidence to be submitted to verify the installation (remedial scheme, and verification plan, to which parts 3 & 4 (and condition 6) relate(s).

I would also strongly encourage the applicant to formalise the discovery strategy if it were a remedial measure – as this strategy would serve to frame reasonable expectations under condition 7 and so serve to minimise the risk that respective views of the Council and the (Applicant /) Principle Groundworks Contactor may differ in respect of on what is considered "declarable potentially significant contamination", and who is expected to monitor for it.

Best Regards,

Mr. Jonathan Driver
Environmental Control Officer