

Surface Water Quality Monitoring Plan

Former Brockhampton West Landfill, North of Harts Farm Way, Havant

Presented to: Clowes Developments (UK) Ltd

Delta-Simons Report Number: 19-2099.09 / 87080. 544066

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
01	Final	21/10/2022				
				David Jackson Associate	Chris Everitt Associate	Mike O'Halloran Associate Director

1.0 Brief

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Exton Estates on behalf of Clowes Developments (UK) Ltd (the "Client") to undertake the preparation of a Surface Water Quality Monitoring Plan (SWQMP) for the former Brockhampton West Landfill, North of Harts Farm Way, Havant, PO9 1HS (the "Site").

The Site has been granted outline planning permission (Ref. APP/21/00189) for development into logistics warehousing.

2.0 Context & Purpose

The SWQMP shall be implemented throughout the Enabling and Construction Works Phase of the works for the above project as detailed within this document. The SWQMP will form part of the Site management procedures which will also run-in compliance with the Construction Environmental Management Plan (CEMP).

This SWQMP describes and presents the management process, procedures, controls and feedback mechanisms that will be employed to control, mitigate and monitor potential for adverse impacts to surface water, specifically the Hermitage Stream, from enabling/construction activities on Site.

This report relates only to the monitoring, assessment and mitigation measures relating to impacts on surface waters. Requirements for monitoring any discharges of surface water runoff from the Site to the Hermitage Stream are to be considered under the relevant consents which will need to be sought prior to works commencing.

3.0 Potential Impacts

The nearest surface water feature is Hermitage Stream that trends north-south on the eastern boundary of the Site. The Hermitage Stream generally flows southwards into Storehouse Lake (Langstone Harbour) but adjacent to the Site it is tidal, with flow direction reversing during rising tides. Langstone Harbour is a site of significant ecological importance with designations including Natura 2000, Ramsar, Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Special Protection Area (SPA).

The desk-based assessment and walkover study identified a number of potential risks to the water environment as a result of anticipated construction activities. These comprised:

Fuel and liquid spillages;

Sediment run off/fines specifically after Site strip/heavy rainfall;

Groundworks (e.g. excavation of landfill waste materials) mobilising contaminants;

Piling / ground improvement; and

Flooding of the Site during works.

4.0 Procedures

The SWQMP and CEMP shall be adhered to throughout the Enabling & Construction Works Phase to include preventive and precautionary methods of working and if necessary, a mechanism through which abnormal or emergency situations are managed and addressed. The plan shall be enacted on all occasions, whatever the source of information. However, the main mechanisms for identifying issues pertaining to the water environment e.g., potential pollution incidents are as follows:

An appropriate person to undertake daily checks of the Hermitage Stream to check for visual evidence of impact e.g. increased silting and/or hydrocarbons sheens/plumes. Photographic evidence to be collected and collated for presentation at the end of the enabling and construction phases;

An appropriate person shall undertake a Site walkover on a weekly basis and complete an Environmental Site Inspection Form with photographic evidence to demonstrate compliance with the CEMP. These forms shall form the primary source of environmental checks of the works;

Water quality monitoring to alert of any detrimental effects of activities, particular enabling works (excavation of landfill wastes) and construction activities (piling), on water quality and provide evidence of the effectiveness of management procedures on Site;

All Site workers shall be given tool-box talks to enable them to understand the mechanism for reporting environmental incidents, including spillages, and how to respond to an emergency or abnormal situation with regards to the water environment;

Key staff should practice pollution incident response drills at the start of works and then every two months during the enabling and construction phases; and

Site Staff shall be encouraged to identify potential pollution incidents and/or concerns and report them to the Construction Manager.

5.0 Monitoring Sampling and Analysis

5.1 Frequency

A daily check of visual water quality of the stream should be undertaken .i.e. check for any evidence of fuel/oil/hydrocarbon sheens and presence of discolouration or silt;

There should be at least four rounds of monitoring during the excavation of landfill waste materials which is anticipated to take approximately three months to complete;

At all other times during the Enabling Phase sampling should be undertaken once monthly; and

Once monthly during the Construction Phase where piling, ground improvement or installation of Controlled Modulus Columns is being undertaken.

The frequency of monitoring will need to be reviewed and agreed with the regulators in instances where there are breaches of trigger levels (Refer to Section 5.5. below) and/or actual visual evidence of impact on the stream.

5.2 Monitoring Parameters

Samples should be analysed on a three-day turnaround;

Results should be interpreted by the appointed Environmental Consultant. Where an impact is identified i.e., where concentrations of contaminants within the mid and downstream samples are considered by the Environmental Consultant to significantly exceed the baseline, the results should be discussed immediately with the Client. The contractor is to cease operations if considered necessary by the Environmental Consultant and review / amend working methods and the Contractor is to inform the regulators to determine and agree appropriate courses of action.

5.3 Locations

Up, mid and downstream samples should be taken to allow comparison with the baseline data. The sample points are illustrated below.



5.4 Laboratory Analysis Suite

Samples should be tested for following determinands:

Suspended solids –due to works on Site likely generating silts;

Ammoniacal nitrogen –contamination of concern identified in the previous assessments;

Nitrates suite (nitrate, nitrite) - contamination of concern identified in the previous assessments;

BTEX /MTBE –due to likely storage of fuel on Site;

Total petroleum hydrocarbons (speciated [CWG]) –due to likely storage of fuel on Site.

5.5 Baseline Monitoring and Thresholds

Baseline monitoring of the Hermitage Stream has been previously reported in the Additional Surface Water Quality Monitoring –Hermitage Stream Letter Report by Delta Simons (Ref. 19-2099.09) dated 3rd December 2021 (please refer to Appendix B).

Based on this monitoring the table below sets out the proposed trigger thresholds where contaminants are above the LoD¹ and where comparison between upstream, midstream and downstream results suggest that the source of the impact is the Site:

Contaminant of Concern	Trigger Thresholds	Comments
Ammoniacal nitrogen (NH ₄)	135 ug/l	Baseline (111.2 ug/l) +20%
Total nitrogen species	10 mg/l	Baseline (8.2 mg/l) +20%
Total Petroleum Hydrocarbons	300 ug/l	Hydrocarbons were below the LoD during the three baseline monitoring events ; Delta-Simons propose that the target levels for intervention to be set at these generic screening values. Again, where comparison between upstream, midstream and downstream results suggest that the source of the impact is the Site. A conservative trigger value for Total Petroleum Hydrocarbons has been set at 300 ug/l.
Aliphatic (All Fractions)	300 ug/l ⁺	
Aromatic >C5 –C7 fractions)	1 ug/l [^] (benzene)	
Aromatic >C7 –C8 fractions)	74 ug/l [^] (toluene)	
Aromatic >C8 –C10 fractions)	20 ug/l ^{\$} (ethylbenzene)	
Aromatic >C10 –C12 fractions)	90 ug/l [*]	
Aromatic >C12 –C16 fractions)	90 ug/l [*]	
Aromatic >C16 –C21 fractions)	90 ug/l [*]	
Aromatic >C21 –C35 fractions)	90 ug/l [*]	
Benzene	10 ug/l [^]	
Toluene	74 ug/l [^]	
Ethylbenzene	20 ug/l ^{\$}	
Xylenes	30 ug/l [#]	
MTBE	1.5 ug/l [#]	
Suspended solids	>250 mg/l [£]	No baseline data available. Compare upstream, mid-stream and downstream values to establish if likely to be Site derived or potentially an upstream source.

Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies, CL:AIRE, 2017

\$ EQS

* UK Drinking Water Standards

^ Water Framework Directives for Inland Surface Waters

+ Professional judgement based on WHO guidance and former Surface Water Directive –Protection of Surface Waters for the Abstraction of Drinking Water.

£ Environment Agency Guidance: Incidents and their classification: the Common Incident Classification Scheme (CICS) (2016)

Note: These proposed trigger values will need agreeing with the regulators

¹ Limit of Detection

5.6 Corrective Actions/Mitigation

Where sample analysis results are screened/interpreted to be above the Baseline (Trigger) Values, or where visual evidence of impacts are identified the following actions should be undertaken:

Notify the Construction Manager;

Construction Manager to decide if this is a 'minor' or 'major' incident in conjunction with the Environmental Consultant. For the purposes of decision making on what constitutes a Minor or Major pollution incident we would propose to follow the Environment Agency Guidance: Incidents and their classification: the Common Incident Classification Scheme (CICS) (2016) ². The specific excerpt table for the classification of impacts on water is included in Appendix C;

The specific corrective actions/mitigation based on the severity of the pollution incident is as follows:

- o Minor (Category 3 or 4 Pollution Incident) :
 - Provide evidence that management procedures on Site (for example sediment run-off control, fuel storage tank containment issues, refuelling leak containment) are working correctly and log this in the Site diary;
 - Monitor the situation.
- o Major (Category 1 or 2 Pollution Incident):
 - Suspend the works activity on Site inferred to be creating the adverse impact, until Site management is confident that further adverse impacts will not occur;
 - Notify the relevant regulators for urgent discussions on this matter and to decide if the incident is a Pollution Incident as regulated by the Environment Agency;
 - Identify the appropriate discipline owner;
 - Identify and undertake remedial and preventative actions as necessary;
 - If deemed appropriate undertake further sampling on the quickest laboratory turnaround possible;
 - Any exceedances of the Baseline Threshold Values should be communicated to stakeholders, including the regulators, advising how the situation has been resolved;
 - Discuss with the regulators and obtain approval for the impacting Site works activity to recommence.

6.0 Reporting and Recording

The following reports / recording should be produced:

Daily checks of the stream –commentary to be provided in the Site diary (photographs to be retained digitally in a clearly labelled and well organised manner);

Weekly Site Checks –records to be kept on Site for inclusion in Verification Reporting, including a brief summary of daily checks over the last week;

Surface Water Quality Monitoring Events - The results of the water quality monitoring will be collated, interpreted (by an Environmental Consultant), and made available to the Principal Contractor, Client & Regulators within one week of each collection. A copy of the report should be sent to the regulators. Should baseline threshold levels for ammoniacal nitrogen, total nitrogen, BTEX and/or hydrocarbons be breached immediate contact and/or meetings with the relevant statutory bodies would be required.

² [04_01 Incidents and their classification: the Common Incident Classification Scheme \(CICS\) \(ofwat.gov.uk\)](https://www.ofwat.gov.uk/publications/04_01_incidents_and_their_classification_the_common_incident_classification_scheme_cics/)

If any exceedances of defined baseline threshold values occur, verbal discussions with the Contractor, Client and Regulators should be undertaken as soon as reasonably practicable. This should include the level of impact and proposed corrective actions/mitigation and further monitoring requirements. Further to this a report of such Exceedances should be prepared and reported as soon as reasonably practicable (but at no more than 5 days after receipt of chemical analysis results, or 10 days after the incident). These reports should be produced by an appropriately qualified Environmental Consultant.

Figures

Figure 1 –Site Location

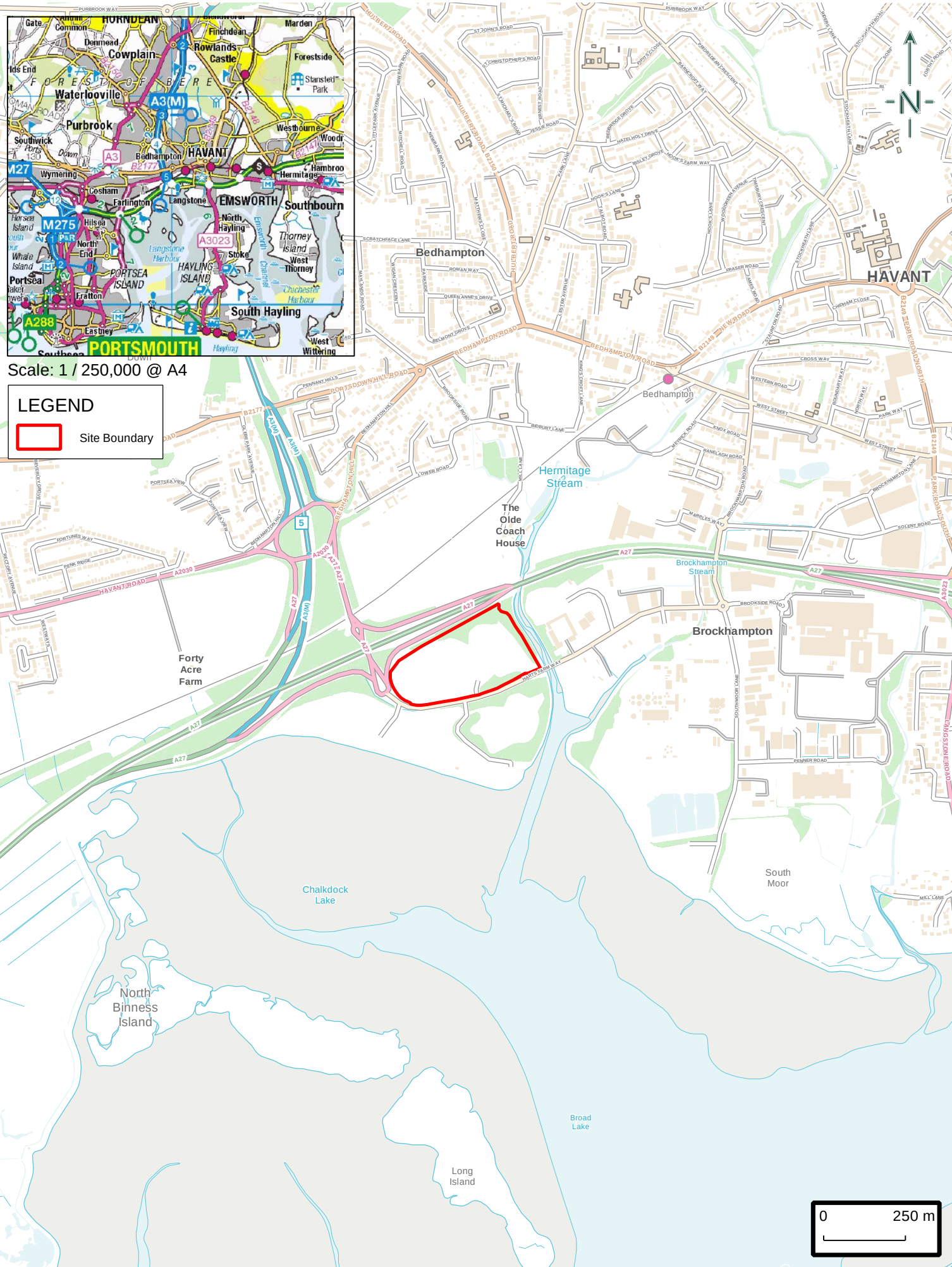


Figure 2 –Site Plan



Bing



TITLE:
Brockhampton West Landfill
Site Plan

DRAWN BY: DJ	SCALE (@A4): 1:2,500	PROJECT NO: 19-2099.09
CHECKED BY: DJ	REVISION: -	FIGURE NO:
DATE: 18 October 2022		Fig 2

Appendices

Appendix A –Limitations

Limitations

This Report was prepared by Delta-Simons Ltd (Delta-Simons) for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. Delta-Simons does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Delta-Simons. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Delta-Simons' Standard Terms and Conditions as included within our proposal to the Client.

The recommendations contained within this Report represent Delta-Simons professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the Report.

Where Delta-Simons has obtained, reviewed and evaluated information in preparing this Report from the Client and others and Delta-Simons conclusions, opinions and recommendations has been reasonably determined using this information, Delta-Simons does not warrant the accuracy of the third-party information provided to it and cannot be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

Site surveys document the conditions encountered at the time of survey only and conditions may change due to natural processes or human intervention. As such, surveys represent an assessment at a specific point in time and Delta-Simons cannot be responsible for adverse conditions which arise or become apparent after the time of the survey or for conditions which sit outside the scope for which the survey or Report was commissioned.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work period and on the results of laboratory and field tests performed during the investigation. Ground conditions are inherently variable such that no investigation can be exhaustive to the extent that all adverse conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed or obtained as part of this assessment. It should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions. Where risk assessment is undertaken, this is based upon the standards, guidance and common practice at the time of the assessment and Delta-Simons cannot be responsible for conditions which become apparent following changes in guidance or practice or advancements in scientific knowledge which change the position in relation to assessment of risk.

No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

Where budgets are prepared and presented within the Report, these are for information only to indicate the likely magnitude of a cost and do not represent an invitation to treat for the works. All budgets and programmes presented should be reviewed and verified by appropriately qualified and experienced independent Project Managers and Cost Consultants.

Appendix B –Additional Surface Water Quality Monitoring –Hermitage Stream Letter Report (2021)

Our Ref: 19-2099.09

3rd December 2021

Attn: James Mawson
Exton Estates
[Sent via Email]

Dear James

Additional Surface Water Monitoring – Hermitage Stream

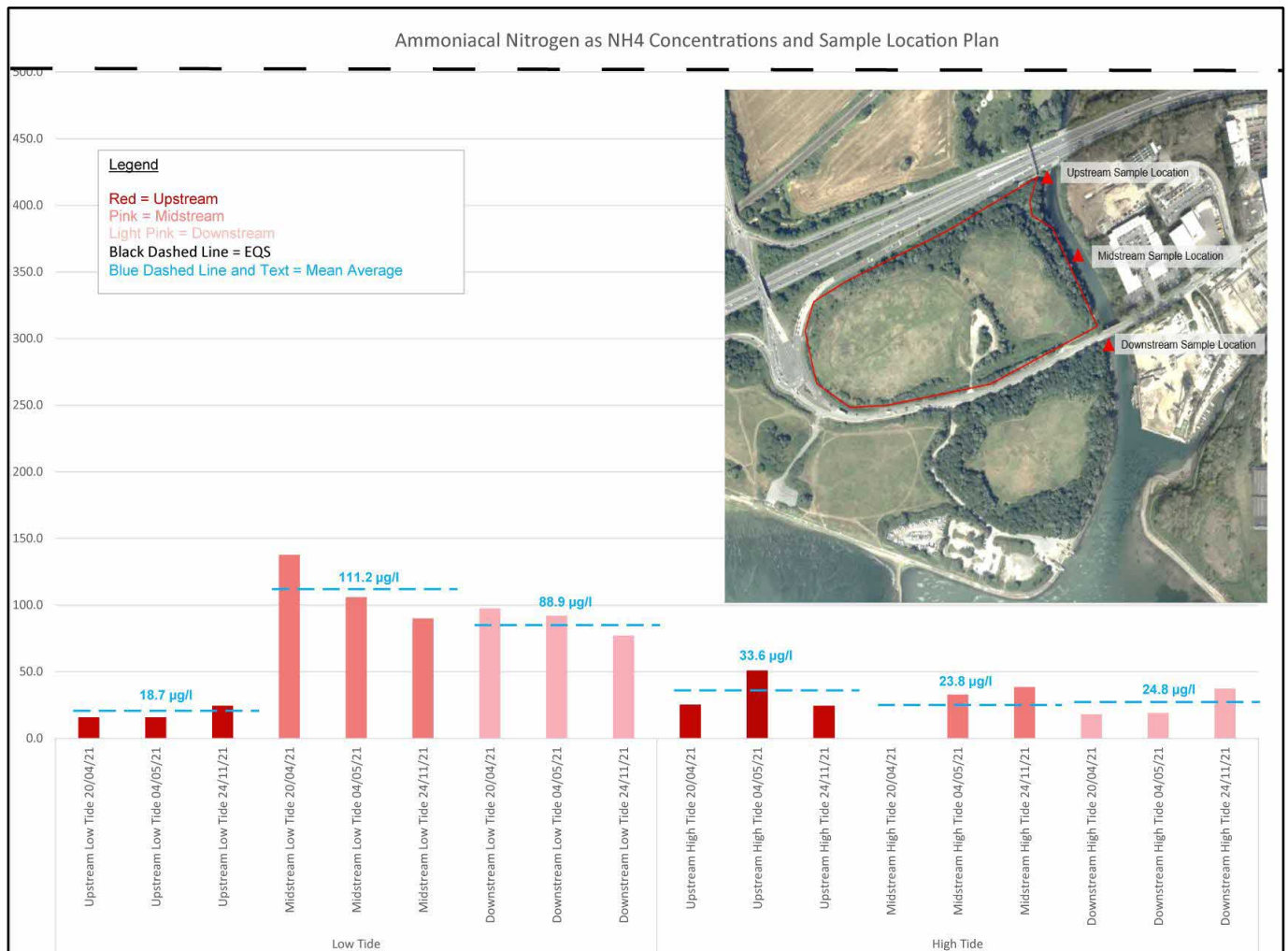
Delta-Simons Environmental Consultants Limited (“Delta-Simons”) was instructed by Exton Estates on behalf of Clowes Developments Ltd (the “Client”) to undertake additional surface water monitoring at the Hermitage Stream (the “Stream”) for the proposed development at the former Brockhampton West Landfill, North of Harts Farm Way, Havant, PO9 1HS (hereafter referred to as the ‘Site’).

Previous surface water quality sampling undertaken within the Stream comprised of two monitoring rounds (at both high & low tides) in April/May 2021. Whilst these targeted both a prolonged dry period and a recent storm event further monitoring was undertaken on 23rd to 24th November 2021 (during the winter period) due to the potential for increased rainfall and subsequent infiltration to ensure that the baseline data is sufficiently robust/representative.

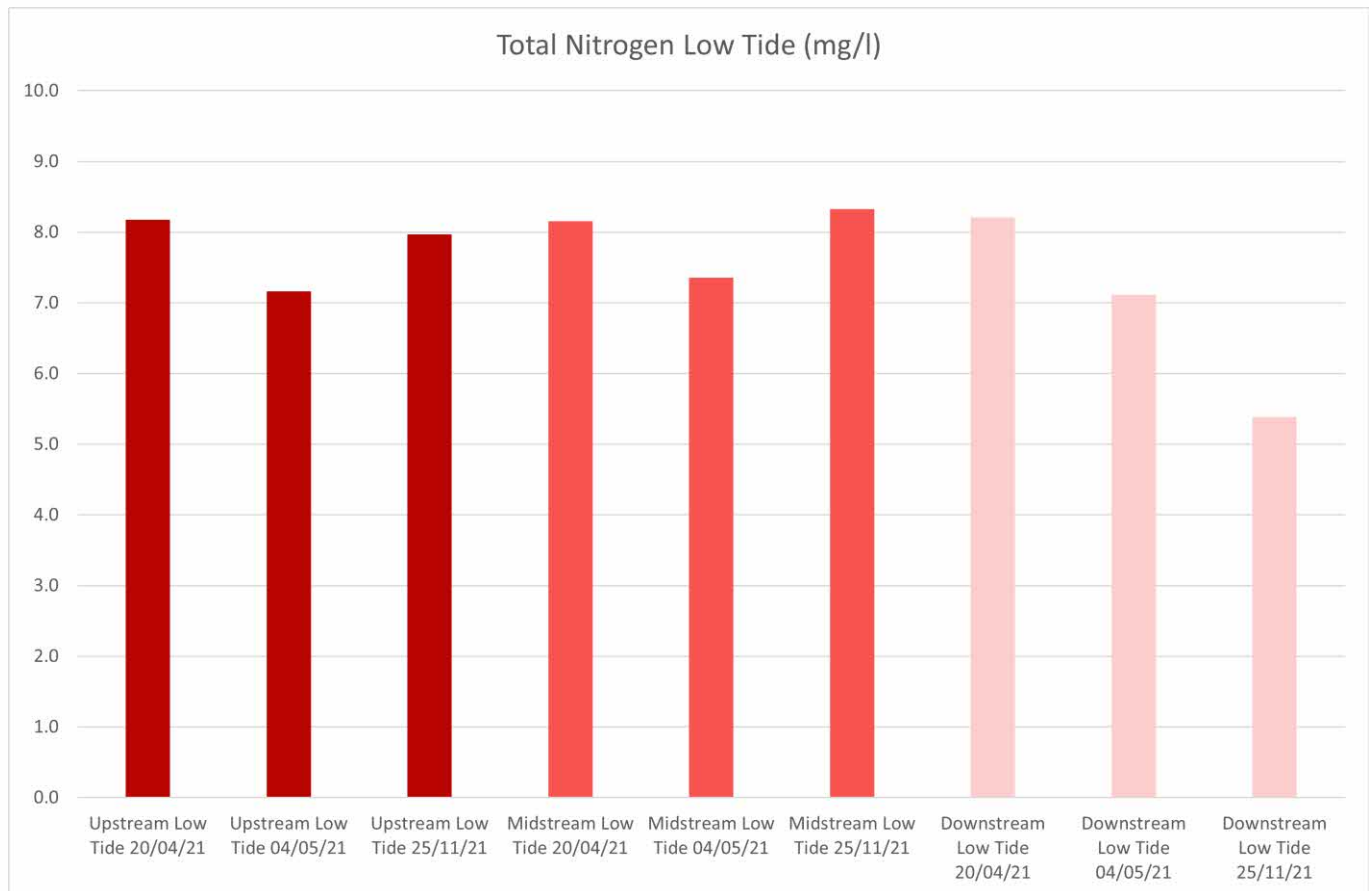
Monitoring comprised the retrieval of surface water samples from the previous up, mid and downstream monitoring locations at both low and high tides. Whilst mineralised nitrogen species have been identified as the key risk driver the following contaminants have also been analysed in line with the original sampling:

- ▲ pH
- ▲ Sulphate
- ▲ Chloride & total phosphate
- ▲ Ammoniacal nitrogen
- ▲ Nitrates suite
- ▲ Chemical & Biological Oxygen Demand
- ▲ Phenols (speciated and total)
- ▲ Polyaromatic hydrocarbons (speciated & total)
- ▲ Heavy metal suite
- ▲ BTEX/MTBE
- ▲ Total petroleum hydrocarbons (speciated [CWG])

The graphs demonstrating the previous two rounds of monitoring for ammoniacal nitrogen (as ammonium) and total nitrogen species have been updated with this recent monitoring round data and are presented below.



As evident in the above graph the ammoniacal nitrogen concentrations (as NH₄) are broadly similar to previous monitoring rounds within the spring months. A mean concentration has been calculated to allow further monitoring data to be compared more easily against the established baseline to assess potential impact from the development (if any).



The total nitrogen concentrations have also been calculated for the third round of monitoring and the above graph has been updated to reflect this. As you can see from the graph the concentrations of total nitrogen are again broadly similar to previous monitoring rounds with no significant trends being identified i.e., low upstream concentrations compared to mid/downstream concentrations.

Delta-Simons opinion is that the surface water monitoring dataset over different temporal conditions should now be considered to provide a sufficient and robust baseline dataset.

Further to above the Remediation Strategy for the Site has placed a requirement within the Construction Environmental Management Plan (CEMP) to undertake periodic monitoring of the Stream during the groundworks phase of the development as a precautionary measure to monitor for impacts on this watercourse during this activity. This is to be specifically formalised via a Surface Water Quality Monitoring Plan which in conjunction with the overarching CEMP will require approval by the Local Council and Environment Agency prior to implementation.

We trust this fulfils the requirement of the further monitoring agreed at the recent regulatory meeting for characterisation purposes. Should you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely,
Delta-Simons



David Jackson
Principal Consultant
david.jackson@deltasimons.com

Enclosed:

- ▲ Surface water monitoring laboratory analysis results, i2 Laboratories (Ref. 21-25044-1)

Appendix C - Incidents and their classification: the Common Incident Classification Scheme (CICS) (2016)

Category	Criteria	Definition and guidance on impact criteria (one or more definition or criteria are met)
Category 1	Major effect on water quality	A persistent and/or extensive effect on water quality which has a serious effect on the quality or use of that water. Persistent For surface water, 'persistent' means an effect is still evident at least 7 days from the date that contamination enters the water. Extensive For surface waters, 'extensive' means an effect over several kilometres of a watercourse or a large area of a still water or coastal waters. As a guide, use 1-2km, but some subjectivity may be applied. For example, a major deterioration in water quality or covering of silt over half a kilometre on a large important river (such as the lower Severn or Thames) would be a Category 1 incident. Serious For surface waters, 'serious' effects include levels of dangerous substance(s) exceeding toxicity levels known to cause serious harm/death to aquatic life or dissolved oxygen levels falling to critical levels. It would not include minor impacts such as a slight drop in dissolved oxygen levels even if they extend over several kilometres. Apply Category 1 where damage would lead to a deteriorated status of a Water Framework Directive water body (with significant implications under the Environmental Damage Regulations). As an additional guide for soil run-off incidents, suspended solid concentrations are exceptionally high (>1000mg/l) compared with background levels upstream of incident
Category 2	Significant effect on water quality	Significant but normally localised effect on water quality which has a significant impact on the quality or use of that water. For surface waters, examples of Category 2 impacts include silt or soil, low dissolved oxygen or high ammonia levels over an extensive stretch of a water body. Impacts may be up to a couple of hundred metres in a larger water body or effects over several kilometres (such as a heavy rainbow coloured oil film). As an additional guide for soil run-off incidents, suspended solid concentrations are exceptionally high (>500mg/l) compared with background levels upstream of incident
Category 3	Minimal effect on water quality	Limited and localised effect on water quality which has a minimal impact on the quality or use of that water. For surface waters, impacts are normally localised around the point of discharge, but could include an impact extending over several kilometres of a stream (such as a thin oil sheen) As an additional guide for soil run-off incidents, suspended solid concentrations are exceptionally high (>250mg/l) compared with background levels upstream of incident.
Category 4	No impact	Substantiated incident with no impact to water quality.