Taylor Wimpey – South Wales

Environmental Permit Application – Supporting Statement

Sully Phase 2, South Wales

316099 R02 (00)

May 2026

RSK GEOSCIENCES

RSK GENERAL NOTES

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1 INTRODUCTION

RSK Environment Limited (RSK) has been commissioned Taylor Wimpey – South Wales, hereafter referred to as Taylor Wimpey, to produce a supporting statement to accompany an application to National Resources Wales (NRW) for a Bespoke Environmental Permit for Phase 2 of their residential development located in Sully, near Barry, South Wales, hereafter referred to as "the site".

The Bespoke Environmental Permit is intended to support the discharge of surface water during the construction phase for Phase 2 of the proposed development. Additional and supporting information to that provided in the application forms is included herein.

Sections 1 and 2 also provide a non-technical summary of the planned discharge.

The development is located on the eastern margin of the village of Sully, Penarth, nearest postcode CF64 5WD and is centred at National Grid Reference (NGR) ST 16143 68430. The development site covers approximately 13.5 hectares (Ha) in area.

The site is accessed from the north-east off Swanbridge Road. A proposed additional access is to be provided from the north via Steep Holm Walk once constructed. The site is bound by Swanbridge Road to the eastern beyond, which are agricultural fields. Further fields are located immediately south of the site. Existing residential areas are located to the south-west, west and north. A public footpath trends north to south along the western boundary. Hedgerow is present along the northern, eastern and western boundaries.

Ground levels are typically highest on the north-eastern boundary at approximately 46m above ordnance datum (AOD), falling to the south and south-west, with the south-western corner at the lowest point at 34m AOD.

Works are due to commence, but currently the site remains undeveloped agricultural land. The following general construction elements are anticipated as part of the development.

- Construction of residential units across the site;
- Construction of a foul pumping station with emergency storage in the south-western corner of the site;
- An area of Public Open Space (POS) in the south-eastern boundary;
- Two play areas in the central area of the site;
- Two ecological ponds along the northern boundary, set aside for ecological biodiversity net gain (BNG), for the protection of newts. These basins will not form part of the storm water drainage system (off line);
- Construction of public highways to provide access to new residential areas, including associated infrastructure (foul and surface water (storm) drainage) and surface water management via highway rain gardens, attenuation basins, swales and two sub-surface emergency cellular storage basins.

Site surface water run-off will be discharged from the site boundary via a total of 1No. discharge point, as agreed for the final site layout via the planning approval process, with final outfall from the completed development via the attenuation basin outfall at the boundary of site to an existing surface water sewer drainage culvert and hydrobrake

running under Brean Close off site to the southwestern corner of the development. This ultimately discharges downgradient to Sully Brook and Cadoxton River. The approximate discharge point locations and discharge rates are set out in **Table 1**.

Table 1: Construction phase site discharge point

Location	Outfall type	Approximate NGR	Discharge Rate l/s (Q bar)
Attenuation area outfall	Headwall	ST 15957 68289	15.1
Off site hydrobrake at Brean Close	Hydrobrake	ST 15961 68279	Unknown

Depending on site arrangements, flow rates shall be controlled by utilising the physical restricted channel infrastructure, via the permanent outfall.

This application seeks to secure a Bespoke Environmental Permit for the discharges from the permanent discharge point as outlined above.

This report is subject to the RSK service constraints given in **Appendix A**.

2 SURFACE WATER DISCHARGE DESCRIPTION

With respect to the development, surface water refers to the movement of rainwater and associated site generated run-off across the development footprint.

Copies of the engineering drawings for the site as included in the SWMP presented in **Appendix B** of this document and should be referred to in conjunction with this report. The drawings set out the drainage system for surface waters for the development area.

The surface water drainage strategy for the site indicates the location of permanent attenuation basins, indicative outfalls for said basins and indicative swale features. The arrangements for the development are outlined below.

The surface water drainage system across the site, will consist of highway rain gardens. These will drain via newly constructed below ground infrastructure to a series of swales around the perimeter of the site. Swales 1 and 2 will be located off the eastern boundary. Swales 3 and 4 along the southern boundary and swales 5 and 6 along the northern boundaries. The swales will be interconnected and convey water to an attenuation area of along the western and south-western boundary. This attenuation area will discharge to the off site hydrobrake. Supporting the swales, are areas of permeable paving, which will convey water to the swales and two below ground cellular crates in the centre and south-western corner of the site, respectively. Additional areas of attenuation are also located across the wider site.

A site specific SWMP, presented within **Appendix B**, has been developed for the site, with the surface water mitigation set out within that report. Furthermore, regular inspections and updates of the SWMP should be undertaken through the lifespan of the development to ensure that the mitigation strategy remains appropriate.

Surface water discharges from the site will comprise rainfall falling onto the development area, including haul roads, building footings and areas of disturbed/exposed ground following the installation of below ground infrastructure and the formation of ground levels to finished floor levels (FFL). As a result of general construction activity, silt may become entrained within site surface water drainage. In light of this, mitigation measures have been designed to minimise remobilisation and assist with the removal of silt from site surface water drainage, prior to discharge.

The proposed treatment may comprise both passive and/or active methods to remove silt from water, with a focus on passive mitigation. However, the future requirement for water treatment using chemical flocculants cannot be fully discounted and is subject to future site conditions. Therefore, an Environmental Permit is being applied for that includes provision to use flocculants.

Water discharged from the proposed discharge point will consist of rainwater run-off that has been generated and collected within the development site. It is confirmed that no foul water will be present in the proposed discharge and that this permit application is not associated with the pumping or treatment of foul water.

A site plan showing the indicative discharge arrangements, passive treatment and key monitoring/sampling locations associated with the proposed development is presented on Figures 2 and 3 of the SWMP, presented in **Appendix B**.

3 ENVIRONMENTAL MANAGEMENT SYSTEMS

Taylor Wimpey South Wales have a series of environmental management systems (EMS) in place which set out the requirements for effectively managing work activities to prevent pollution of water, air and land. Taylor Wimpey South Wales seek to minimise the impact of their site operations, particularly in relation to climate change, energy, water, waste and biodiversity through compliance with their EMS. Taylor Wimpey South Wales is audited on a regular basis with relevant employees provided with specific environmental training.

Copies of the relevant environmental management systems utilised by Taylor Wimpey South Wales are presented in **Appendix C**.

4 QUALITY OF DISCHARGE WATER

The greenfield site has been subject to intrusive ground investigation works, conducted by Terrafirma in 2022.

The reports describe a site wide investigation of soils. The ground investigation report included a contamination risk assessment supported by laboratory analysis of several samples collected from the soil. The investigation found an absence of shallow groundwater. The report concluded that the risk to the aquatic environment and the chance of any contaminants of concern being present in the effluent are considered negligible, stating:

'Site specific mitigation and remedial measures are not required with respect to the aquatic environment'.

Consequently, the site is expected to discharge rainfall-derived clean surface water. The principal contaminant to these surface waters are considered to be from re-mobilised silt (suspended solids), associated with exposed soils during the enabling and construction phases of the development. The risk from which is further assessed in **Section 5**.

It should be noted that the following two factors could influence the potential concentration of suspended solids within run-off prior to treatment. These include:

- Amount of exposed sediment available for mobilisation; and
- The volume of rainfall which generates site surface water drainage.

5 RISK SCREENING ASSESSMENT

An assessment of the environmental risks of the operations covered under this application for a discharge consent has been prepared in accordance with the following principles of the H1 methodology and the superseding NRW Horizontal guidance which mirrors the EA surface water pollution risk assessment guidance (https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit#when-you-do-not-need-to-carry-out-screening-tests):

- Step 1 – identify risks
- Step 2 – assess risks
- Step 3 – justify appropriate measures (if needed)
- Step 4 – present the assessment.

Groundwork and construction for the development within the application area yet to commence.

Step 1: Identify Risks

The H1 overview document identifies the following different types of risk to the environment.

- Odour – there are no potentially odorous activities or chemicals associated with the construction work.
- Noise & vibration – construction noise & vibration will occur but be limited to the allowed working hours (0800-1800 Monday to Friday and 0800 to 1300 Saturday). Noise & vibration resulting from the discharge activity are not envisaged as being significantly more noticeable than from the other construction activities at the site.
- Accidents – the potential for accidents to occur exists. The potential for contamination of the receiving surface waters will be managed to acceptable levels by the control measures put in place for the construction activities.
- Fugitive emissions to air and water - no significant risks have been identified for emissions to air. The potential for contamination of the surface water receptors will be managed to acceptable levels by the control measures put in place for the construction activities.
- Controlled releases to air – there are no point source emissions to air.
- Controlled discharges to surface water – surface water discharge locations have been identified as outlined within Section 1 and shown in Figure 2 and 3 of the SWMP presented in **Appendix B.**
- Controlled discharges to ground or groundwater – there are no discharges to groundwater.
- Global warming potential of air emissions – negligible as surface water discharge.
- Site waste – the quantity of site waste generated will be small and consist primarily of silt/sediment removed from the surface water management system. This would be re-

used at site (where feasible) under the appropriate regulatory approvals or disposed of at an appropriate facility.

Steps 2/3/4 – Assess Risks

In accordance with the H1 methodology and the NRW surface water pollution risk assessment guidance, the following activities have been considered relevant to the proposed permit application and therefore carried forward in this risk screening assessment:

- Accidents.
- Surface water discharges.

Due to the nature of the observed geology and the poor to negligible infiltration rates recorded on the site during permeability testing, it is not considered necessary to consider risks to groundwater. As described in Section 2 of the accompanying SWMP, presented in **Appendix B**, the bedrock geology beneath the site largely comprise the Mercia Mudstone group composed of mudstone, weather to clay at the surface.

The underlying bedrock at the site is classed as Secondary B aquifer and the site does not lie within a Source Protection Zone (SPZ). The risk the site is considered to pose to sensitive controlled waters receptors is low.

Accidents

The site will be secured by fencing with no public access. Therefore, accidental releases as a result of vandalism are not likely. However, the potential for accidents/accidental releases of contaminants, such as fuel, on the construction site cannot be discounted and as such is assessed.

A risk assessment for accidents is presented in **Table 1**.

Surface Water Discharges

Prior to the commencement of construction activities at the site, rainwater falling across the development site would discharge by one of the following pathways:

- Infiltrate into the topsoil and percolate into the underlying geology;
- Via evapotranspiration;
- Flow downgradient via overland flow

Accordingly, the surface watercourses which the proposed discharges will enter are the same as those which received run-off prior to the commencement of construction activities.

The water to be discharged from the site comprises site surface water drainage from the development area.

As identified previously, the principal potential contaminant to surface waters is mobilised silt (suspended solids).

No other significant pollutants or priority hazardous substances associated with the proposed site discharge have been identified.

As detailed in the SWMP, the potential risks associated with the proposed discharge will be reduced by the implementation of management and mitigation measures.

The management and mitigation measures installed at the site will remove suspended solids from site surface water drainage and ensure that discharges from the site will be clean and uncontaminated. Regular monitoring will be supported by sample collection and analysis, to confirm appropriate discharge quality is maintained.

The discharge will be at ambient conditions so there will be no temperature effects as a result of the management and mitigation measures.

As the discharge will not contain any hazardous substances, sanitary determinants or other pollutants, detailed specific substances assessments are not considered to be necessary.

The proposed site surface water discharge risk assessment (including accidents) is presented in **Table 1**.

Table 1: Risk Assessment for Proposed Site Surface Water Drainage Discharge

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Leak/spillage of hazardous material on site (e.g. oils and fuels)	Sully Brook and Cadoxton River	Via the surface water drainage system (storm system)	Containment measures for storage. All fuel stored on impermeable ground in appropriate containers such as bunded cells with double walls. Additional capacity, drip trays/sump pallet will also be deployed, if required. Spill kits will be maintained adjacent to storage areas. Minimisation of storage volumes. Regular maintenance & inspection	Unlikely	Contamination of Sully Brook and Cadoxton River with hazardous substances.	Low – due to procedures detailed in site environment management plans (e.g. fuel/oil use and storage, waste/material storage).

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Leak of oil/fuel from pumps used as part of a water treatment system or other temporary pumping activity	Sully Brook and Cadoxton River	Via the surface water drainage system (storm system)	Containment measures for storage. All fuel stored on impermeable ground in appropriate containers such as bunded cells with double walls. Additional capacity, drip trays/sump pallet will also be deployed, if required. Spill kits will be maintained adjacent to storage areas. Minimisation of storage volumes. Regular maintenance & inspection	Unlikely	Contamination of Sully Brook and Cadoxton River with hazardous substances.	Low – due to procedures detailed in site environment management plans (e.g. fuel/oil use and storage, waste/material storage).

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Discharge of water containing suspended solids (silt)	Sully Brook and Cadoxton River	Overland flow from site, or discharged from outfall(s)	Silt mitigation measures set out within site-specific SWMP including silt fences, silt curtains and basin headwall protection. Regular monitoring and update to mitigation and management measures as required. Testing of discharge.	Low	Contamination of Sully Brook and Cadoxton River with suspended solids (silt).	Low – with management and monitoring measures in the SWMP to reduce the potential for additional silt to be present in the site surface water drainage. Suspended solids to be removed from site surface water drainage via passive management systems prior to discharge. If the water shows signs of silt, the discharge will be suspended and the management systems inspected for signs of a fault. Any faults with the passive management measures will be immediately rectified, with discharges recommencing under close observation to confirm fault resolution. Faults with flocculant based management measures will be addressed in consultation with the supplier. Once resolved, discharges will recommence under close observation.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Discharge of water containing Polyacrylamide from flocculant dosed passive treatment process Gel Flocculant 360 and 494	Sully Brook and Cadoxton River	Discharged from outfall(s)	Completion of a thorough chemical dosing trial by the supplier of the treatment system to determine the appropriate chemical dosing rates prior to the commencement active treatment activities. Regular monitoring and testing of discharge to confirm adequate discharge quality. There are no known components present within either Gel Flocculant 394 or 494 that are classified as hazardous to health or the environment.	Low	Contamination of Sully Brook and Cadoxton River with dosing chemicals.	Low – The completion of a dosing trial by the supplier of the passive management system has been undertaken and calculation will be undertaken prior to usage in each specific location, dependent on flow rates and volume will ensure that the volumes of the chemicals are applied to the incoming water and that there are no residual chemicals in the treated water upon discharge. If monitoring and testing identify the potential imbalance in chemical dosing rates, the management system supplier will be contacted and a revised dosing trial will be undertaken and chemical dosing rates will be updated as necessary.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Discharge of water containing polyaluminium chloride as a coagulant and the anionic polymer AQ2084 from liquid flocculant dosing treatment process	Sully Brook and Cadoxton River	Discharged from outfall(s)	Completion of a thorough chemical dosing trial by the supplier of the treatment system to determine the appropriate chemical dosing rates prior to the commencement active treatment activities. Regular monitoring and testing of discharge to confirm adequate discharge quality. Dosing of chemicals is controlled with flow controllers for added precision to only dose the required levels to achieve the desired results regarding silt levels.	Low	Contamination of Sully Brook and Cadoxton River with dosing chemicals.	Low – The completion of a dosing trial by the supplier of the passive management system has been undertaken and calculation will be undertaken prior to usage in each specific location, dependent on flow rates and volume will ensure that the volumes of the chemicals are applied to the incoming water and that there are no residual chemicals in the treated water upon discharge. If monitoring and testing identify the potential imbalance in chemical dosing rates, the management system supplier will be contacted and a revised dosing trial will be undertaken and chemical dosing rates will be updated as necessary.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Spillage of collected solids from sediment collection systems	Sully Brook and Cadoxton River	Discharged from outfall(s)	Preparation and review of activity specific method statements for cleaning sediment collection systems. Method statements to consider risks associated with spillages of collected solids. Discharges from outfalls prevented during sediment collection. Site spillage control procedures. Deployment of additional silt management / spill kits.	Unlikely	Contamination of Sully Brook and Cadoxton River with suspended solids (silt).	Low – settlement system to be cleaned in such a way as to prevent silt spillage. Discharge outfalls to be bunged during cleaning. Cleaning to be completed by competent persons. Risk assessment and method statement to be carried out prior to cleaning.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Failure of pumping equipment – overflow of water from drainage etc.	Sully Brook and Cadoxton River	Via surface water drainage system	Management measures set out within site-specific SWMP	Unlikely	Contamination of Sully Brook and Cadoxton River with suspended solids (silt).	Low – water is contained on site within surface water detention basins if pumps fail.
Vandalism – unplanned release of fuel, or other hazardous substance.	Sully Brook and Cadoxton River	Via surface water drainage system	Site is secure without public access. Sensitive materials stored securely in lockable containers.	Unlikely	Contamination of Sully Brook and Cadoxton River	Low - due to security arrangements.

6 DISCHARGE VOLUMES

The maximum cumulative discharge rate from all outfalls, as summarised in Table 1, is 15.1 l/s, which corresponds to the maximum flow rate associated with the flow control chambers designed to calculated QBAR values for their respective upgradient drainage catchments.

A breakdown of the associated daily volumes derived using QBAR values is provided in Table 3 below.

Table 3: Summary of Maximum Daily Discharge Rates

Maximum Instantaneous Discharge Rate	Maximum Discharge Rate (per minute)	Maximum Hourly Discharge Rate
15.1 l/s	906 l/min	54,360 l/hr
0.0151 m^3/sec	0.906 m^3/min	54.36 m^3/hr

Site surface water run-off will be discharged from the site boundary via a total of 1No. discharge point, as agreed for the final site layout via the planning approval process, with final outfall from the completed development via the attenuation basin outfall at the boundary of site to an existing surface water sewer drainage culvert and hydrobrake running under Brean Close off site to the southwestern corner of the development; ultimately discharging downgradient to Sully Brook and Cadoxton River.

Depending on site arrangements, flow rates shall be controlled by utilising the physical restricted channel infrastructure, via the permanent outfall.

Based on the above, this equates to a maximum discharge rate of **1,305 m^3/day**.

7 TREATMENT

7.1 Natural settlement

As outlined in the attached SWMP, which is contained within **Appendix B**, the proposed surface water and silt management strategy will utilise passive / gravity driven systems installed across the development site.

The proposed passive / gravity driven systems include the deployment of highway rain gardens, headwall protection, silt mats, silt fencing, swale compartmentalisation, basin compartmentalisation and a polishing channel. It is considered that through the operational practices contained in the SWMP, these systems will remain in place throughout the site's lifecycle.

Whilst the type of protection measures and position depicted in the enclosed site plan provide a representative arrangement layout, it is considered prudent to mark these as indicative locations due to their potential to be relocated during the construction lifecycle.

Maintenance of the surface water mitigation measures, in the form of the settlement tanks, surface water attenuation basins and their de-silting would be needed throughout the operational lifespan of the equipment.

The maintenance of passive silt management measures is to be maintained by the site operator, with appropriate assistance from the equipment supplier.

It is proposed that an option be available for the application of gel flocculants or liquid flocculant to be utilised in addition to passive, gravity-driven silt settlement methods, to ensure that clean, silt free water is discharged from the site.

7.2 Gel flocculant treatment (passive)

Due to settlement rates identified during flocculant dosing tests, it is considered appropriate to supplement the deployment of the above mentioned management systems with measures utilising flocculants. Gel flocculants may need to be considered, particularly during winter months, in the following passive treatment measures across the development site.

Deployment locations for measures containing gel flocculant, shall be required within the below ground drainage infrastructure feeding the onsite attenuation area, (as presented on Figure 2 of the SWMP) to assist natural settlement rates, where settlement by natural means is not sufficient.

Alternatively, or where additional treatment is deemed necessary, water will be circulated through an inline pipe reactor (containing flocculant gel blocks) to remove sediment from waters within one of the attenuation area compartments, prior to discharge to the polishing channel.

A sample has been obtained from the site for settlement testing and dosing trials. These have been used to inform appropriate dosing rates and the most effective gel flocculant combination.

Design of chemical dosing mitigation measures will be provided if confirmed to be appropriate by the developers. The design of the chemical dosing will be dependent on

surface water flow rates to ensure that the water is not over dosed and that an appropriate distance is maintained, post dosing, to ensure that all gel flocculant remains within the site boundary.

The gel flocculant and liquid flocculant testing trial reports are presented in **Appendix D**.

Copies of the appropriate material safety data sheets (MSDS) for the gel flocculants and liquid flocculants proposed are presented in **Appendix E**.

7.3 Liquid flocculant treatment (active)

Due to the potential for water containing suspended solids to be generated during heavy rainfall events, active treatment measures may be deployed (as required and under appropriate approval from NRW) to supplement passive treatment systems. The proposed active chemical treatment system will assist with removing suspended sediment prior to discharge.

There will be no interaction between chemicals utilised in the passive and active treatment systems, where necessary the gel flocculant blocks are to be removed if replaced by a liquid system.

The active treatment measures will include liquid flocculant, coagulant and pH balancer pump and treat system.

The active treatment system will be located in the western area, close to the attenuation area with waters pumped directly from the final compartment of the attenuation basin. The treated waters will then be discharged from the active treatment cell, via a clarifying unit and through a pipe to the polishing channel.

The active pump and treat system would typically comprise two WTS20s and SRT10 lamella clarifiers, utilising liquid flocculant, coagulant and pH balancer. The WTS20s comprise a pump passing water through a chemical pre-treatment system, which will dose incoming water with a flocculant, coagulant, and a pH balancer (if required). The dosing rate will vary depending on the incoming volume of suspended solids within the water as it is automatically analysed, and the dosing adjusted accordingly.

The dosed water will then be distributed into SRT10 lamella clarifiers utilising a gravity based settlement system, which will remove the particles from suspension and capture them within the individual settlement tank units.

The treated water will then be discharged from the treatment system and transferred via dedicated pipework to the polishing channel to the designated discharge point.

The active pump and treat system will utilise polyaluminium chloride as a coagulant and the anionic polymer AQ2084 (otherwise known as Aquatreat 2084) as the flocculant.

Depending on site conditions, the pumps supporting the liquid flocculant and coagulant pump and treat system will operate on a float switch or manually.

The active treatment system incorporates a telemetry unit for measuring water quality and suspended sediment levels prior to discharge through the clarifier.

Active treatment systems (including supporting pumps and pipework) will be monitored and maintained in accordance with the manufacturer's recommendations. Once set up and commissioned, the equipment supplier will provide full training to the site operatives detailing operational, management and maintenance procedures. The equipment

supplier will ensure that sufficient training is received prior to discharging waters from the site.

When operational, the active treatment systems will be visually inspected on a daily basis by the site management team or other appointed person.

Additional monitoring will be undertaken as required during periods of higher use, such as during periods of heavy rainfall.

Should any evidence of faults be identified the treatment and discharge will be suspended and suitable expertise from the supplier sought to address any issues or concerns prior to restarting the treatment process.

7.4 Monitoring

When operational, the treatment locations would be visually inspected on a daily basis. Should any evidence of faults or pollution incidents be identified, the treatment and discharge will be suspended and suitable expertise from the supplier sought to address any issues or concerns prior to restarting the treatment process.

Regular sampling and monitoring will be undertaken at the designated discharge points to ensure the treatment is successful and that suspended solids have been removed such that the water is below the compliance limit of 40 mg/l.

Water samples may be collected at the point of discharge and submitted to an external testing laboratory for analysis of the following determinands:

- Total suspended solids (TSS);
- pH; and
- Total aluminium (only where PAC is used in active water treatment).

It may be necessary to monitor water quality with respect to TSS whilst on site and at short notice for decision making on treatment and discharge options. One option would be the use of a portable turbidity meter. Turbidity is measured in nephelometric turbidity units (NTU); which relates to the transparency or clarity of the water. This test can be conducted in a few minutes in the field using appropriate equipment.

There is no standard correlation between TSS and NTU. Therefore, if on-site NTU measures are required, a relationship between TSS and NTU will be established. It is considered that this would be achieved through the preparation of a suitable calibration curve which would enable the conversion of NTU readings to a representative TSS value. This would strengthen confidence in using an NTU value on site during short term decision making. It is important to note that it is not an absolute value however, it is considered to be a robust method for assessing water quality whilst on site in the very short term.

Turbidity measurements would be collected at appropriate intervals at the designated discharge points.

The use of a NTU calibration curve and NTU testing as an on-site screening criterion would ensure that treated discharge is stopped immediately, if the NTU suggests that the TSS would be exceeded and allows for further corrective actions to be put in place.

In order to ensure compliance, regular sampling and monitoring of the discharge point and associated watercourse will be undertaken throughout the construction phase.

APPENDIX A – SERVICE CONSTRAINTS

APPENDIX A
SERVICE CONSTRAINTS

1. Service Constraints

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

2. Service Constraints where the Report provides an intrusive assessment of ground conditions:

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent

of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

3. Service Constraints where the Report relates to Surface Water Management:

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.

3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibly for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

4. Service Constraints where the Report relates to Waste Management:

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK's assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the

comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

5. Service Constraints for Construction Environmental Management Plan Reports:

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

6. Service Constraints where the Report relates to Ground Gas Membrane Verification:

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/ radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

7. Service Constraints for Environmental Due Diligence (EDD)Reports:

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.

7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

8. Service Constraints for Ground source heat energy Reports:

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

9. Service Constraints for Water Abstraction Borehole Reports:

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.

APPENDIX B – SITE-SPECIFIC SURFACE WATER MANAGEMENT PLAN

Taylor Wimpey South Wales

Sully Phase 2

Construction surface water and silt management plan

316099 R01 (00)

MARCH 2026

RSK GEOSCIENCES

RSK GENERAL NOTES

Project No.: 316099 R01 (00)

Title: Construction surface water and silt management plan – Sully Phase 2

Client: Taylor Wimpey South Wales

Date: March 2026

Office: RSK Environment Limited, The Old School, Stillhouse Lane, Bristol, BS3 4EB

Status: R01 (00)

Author	Andrew Przewieslik	**Technical reviewer**	Tim Crowe
Signature		Signature	
Date:	March 2026	Date:	March 2026
Project manager	Andrew Przewieslik	**Quality reviewer**	Stacey Brown
Signature		Signature	
Date:	March 2026	Date:	March 2026

Revision control sheet				
Revision ref.	**Date**	**Reason for revision**	**Amended by:**	**Approved by:**
Rev 00	19.03.2026	First issue	n/a	see above

CONTENTS

FIGURES

APPENDICES

EXECUTIVE SUMMARY

This summary focuses on identified silt pollution linkages and the interventions, good practices, monitoring and maintenance required to manage silt pollution risk from site construction activities.

It is for initial briefing purposes only and must not be used as a substitute for reading the full text of this Construction Surface Water Management Plan (CSWMP) and CSWMP schematic drawing.

The schematic is a visual summary of identified sources of silt generation, receptors sensitive to silt pollution, pathways by which the silt pollutant may move and the specific required interventions to mitigate the identified silt pollution risks. Its display in the site managers office will aid communication to relevant site staff.

Topography and ground conditions pertinent to sources of silt pollution risk:

The site has a gentle gradient down to the south-west and south. There are no watercourses present on the site boundaries. A hydrobrake is located beyond the south-western corner, connected to a culverted watercourse off site beneath Brean Close.

Published records indicate that the site is underlain by the Mercia Mudstone, which will be weathered to clay and readily remobilize during construction work.

Receptors identified at risk from silt pollution

- **On-site**:
  - Below ground surface water systems, as they become constructed
  - Roadside rain gardens
  - Below ground cellular attenuation crates
  - Attenuation area
  - Ecological ponds
  - General attenuation area
  - Swales 1 through to 6
  - Residents in completed plots (upon completion and occupation)
- **Off site:**
  - Off site culverted watercourse beneath Brean Close
  - Inferred receiving watercourse (Sully Brook) 1km west
  - Public highways beyond site entrance (Swanbridge Road and Steep Holm Walk)
  - Existing offsite residential sensitive receptors

Specific silt mitigation interventions to be implemented (refer to Figure 2):

- Silt fencing along the north-eastern; western and southern perimeters
- Headwall protection at all significant headwalls with the swales and attenuation area
- Compartmentalisation of the attenuation area
- Compartmentalisation of the swales
- Establish a polishing channel within the southern spur of the attenuation area
- Install a forebay prior to the final hydrobrake
- Placement of gel flocculant blocks at key locations within the drainage system
- Contingency has been allowed for an active water treatment system (Siltbuster), if necessary.

Monitoring and maintenance requirements

- Primary Monitoring location:
  M1: Site entrance off Swanbridge Road
  M2: Site entrance off Steep Holm Walk
  M3: Attenuation area outfall in south-western corner

Road condition: Monitor the road surface condition (for track out).

1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by Taylor Wimpey South Wales (the Client), to produce a construction phase surface water and silt management plan (CSWMP) for the construction phase of works at their Sully Phase 2 development.

It is noted that discharge of surface water during the construction phase, is classed as a trade effluent by Natural Resources Wales (NRW), and regulated through the Environmental Permitting Regulations, 2016. Discharge of surface water during the construction phase therefore requires an environmental permit.

The approach and measures recommended within this site-specific CSWMP have been developed to provide a plan to address how surface water may be managed on site during construction phase. The purpose of the measures recommended in this report are to prevent uncontrolled run-off to neighbouring surface watercourses, properties and prevent pollution resulting from discharge of silt-laden surface water into the on-site surface water drainage system and then into the surrounding surface water system.

The objectives of this CSWMP are as follows:

- Employ appropriate mitigation, including monitoring and implementation of contingencies to control and minimise surface water pollution associated with site activities.

The following aspects have been considered during the development of this CSWMP:

- The development activities that produce potential sources of surface water pollution and their point(s) of release to surface water; and
- The mitigation measures that are to be implemented to prevent, as far as is practicably feasible, the potential effect of the surface water pollution release, and details of the persons responsible for the actions at the site.

The primary receptor for the purpose of this report is a culverted watercourse located beyond the south-western corner (off site), as detailed in the design drawings. A copy of which are contained in **Appendix B**.

This document shall be considered as a 'living' document and must be regularly reviewed and amended to reflect site-specific changes or conditions as the development/build progresses.

It is recommended that a current digital and/or hardcopy of this report is retained within the site compound for reference by site staff.

The procedures and control measures contained within this document shall be utilised in the development and implementation of task-specific surface water management actions throughout the development lifecycle.

This document has not been prepared for specific discharge of planning conditions.

This report is subject to the RSK service constraints given in **Appendix A.**

2 SITE SETTING

2.1 Site Details

2.1.1 Site boundaries and surroundings

The development is located on the eastern margin of the village of Sully, Penarth, nearest postcode CF64 5WD and is centred at National Grid Reference (NGR) ST 16143 68430. The development site covers approximately 13.5 hectares (Ha) in area. The site has been formerly occupied by agricultural land throughout its known history. A site location plan is presented as **Figure 1**.

The site is accessed from the north-east off Swanbridge Road. A proposed additional access is to be provided from the north via Steep Holm Walk once constructed. The site is bound by Swanbridge Road to the eastern beyond which are agricultural fields. Further fields are located immediately south of the site. Existing residential areas are located to the south-west, west and north. A public footpath trends north to south along the western boundary. Hedgerow is present along the northern, eastern and western boundaries.

Ground levels typically are highest on the north-eastern boundary at approximately 46m above ordnance datum (AOD), falling to the south and south-west, with the south-western corner the lowest point at 34m AOD.

There are no watercourses on the site boundaries. The nearest watercourse is formed by a hydrobrake chamber located immediately beyond the south-western corner. This connects to a culverted watercourse beneath Brean Close.

A hydrobrake is located off site beyond the south-western corner within an area of public open space (POS). The limiting flow rate is unknown. The hydrobrake connects to a culverted watercourse beneath Brean Close.

2.1.2 Environmental designations

Based on publicly available information of the DEFRA website (https://magic.defra.gov.uk/MagicMap.aspx), the site does not fall within a designated area. There are no environmentally designated sites in the immediate vicinity of the site however, the Bristol Channel, located approximately 670m south of the site has several designations including RAMSAR and SPA and SSSI for ecological reasons, especially Sully island.

2.2 Site geology and hydrogeology

Published British Geological Survey (BGS) geological records indicate that the bedrock geology across the entire site is that of the Mercia Mudstone Group composed of mudstone, weathered to clay at surface. Superficial deposits are absent.

The Mercia Mudstone Group bedrock across the site is classed as a Secondary B aquifer, and the geology is generally of low permeability. The site does not fall within a groundwater Source Protection Zone (SPZ).

Whilst no specific ground investigation has been provided, it is understood from the Flood Risk Assessment that infiltration to ground is minimal and with the absence of shallow groundwater.

2.3 Site hydrology

There are no watercourses on site or the site boundaries. It is understood that there is a hydrobrake located beyond the south-western corner. This connects onto a culverted watercourse beneath Brean Close. The orientation of the culvert is unknown, however it is likely that it trends westwards and confluences with the Sully Brook at a distance of 1km west of the site.

The Sully Brook discharges to the Bristol Channel at Barry Docks at a distance of 3.1km west from the site.

The Bristol Channel is the main receiving watercourse for the region, located 670m south of the site.

During the site walkover conducted in February 2026, no evidence for a watercourse on site and in the south-western corner of the site, could be ascertained.

2.4 Proposed development & drainage system

The proposed works include the construction of 175 residential dwellings, along with associated drainage and infrastructure. The development will comprise standard residential properties with associated highways, above and below ground infrastructure, private gardens, and an area of POS on the south-eastern boundary.

The surface water drainage system across the site, will consist of highway rain gardens. These will drain via newly constructed below ground infrastructure to a series of swales around the perimeter of the site. Swales 1 and 2 will be located off the eastern boundary. Swales 3 and 4 along the southern boundary and swales 5 and 6 along the northern boundaries. The swales will be interconnected and convey water to an attenuation area of along the western and south-western boundary. This attenuation area will discharge to the off site hydrobrake. Supporting the swales, are areas of permeable paving, which will convey water to the swales and two below ground cellular crates in the centre and south-western corner of the site, respectively. Additional areas of attenuation are also located across the wider site.

Along the northern boundary will be two ecological ponds, set aside for ecological biodiversity net gain (BNG), for the protection of newts. These basins will not form part of the storm water drainage system (off line).

2.4.1 Site discharge locations and discharge rates

Site surface water run-off will be collected and conveyed via swales to an attenuation area, prior to discharge via the south-western corner of the site to an existing culverted watercourse off site. The proposed approximate location for the discharge point, during this construction phase, is set out in **Table 1** and illustrated on **Figure 2**.

Table 1: Construction phase site discharge rates

Location	Outfall type	Approximate NGR	Discharge Rate l/s (Q bar)
Attenuation area outfall	Headwall	ST 15957 68289	15.1
Off site hydrobrake at Brean Close	Hydrobrake	ST 15961 68279	Unknown

3 SENSITIVE RECEPTORS

3.1 Sediment contaminant linkage

The process of sediment contamination of surface waters and receptors can be broken down into a pollutant linkage comprising of a source, pathway and receptor. This model forms the basis of land and groundwater contamination assessment and can also be used to assess the pollution of surface waters by construction related suspended solids. The source, pathway and receptors relating to the site and general construction activities is discussed below.

3.1.1 Sources of sediment mobilisation

Mobilised sediment is generated from disturbance and/or disintegration of soils across the site. Generally, the most significant volume of mobilised sediment is generated during the initial phase of enabling/preparatory works including earth excavation and stockpiling, infrastructure construction, and soil stripping activities. Mobilisation of soils are also subject to prevailing weather conditions, with adverse weather (heavy and/or prolonged precipitation) potentially causing significant volumes of sediment to be mobilised.

3.1.2 Pathways of sediment migration

Sediment can migrate via several pathways including direct surface run-off (over-ground flow) determined by topographic relief or preferential migration pathways, via new and proposed infrastructure (e.g. roads, land drains and gullies), pumping (e.g. from dewatering of excavations) and natural migration of groundwater laterally through strata. Site-specific conditions normally determine the preferential pathways for sediment migration. At the site, the primary migration pathway is likely to be via overland flow or via existing land drains. As the construction phase progresses, this is likely to be supplemented by newly installed storm water system (below ground) directly discharging storm waters to existing off site surface water receptors.

3.1.3 Sensitive receptors to sediment

Potential sensitive receptors to mobilised sediment form the end part of the linkage, with a source and pathway preceding. Generally, mobilised sediment migrates along a pathway down a hydraulic gradient towards topographically lower-lying areas. Potential sensitive receptors generally include surface watercourses, infrastructure, vegetation, site occupiers and adjacent occupiers and designated environmentally sensitive sites.

Based on the topography of the site, surface water is expected to flow down-gradient to the south-west and south. Once storm water pipes are installed, surface water can be expected to be intercepted on roadways, allowing silts to be collected into the onsite attenuation areas. The primary receptor to surface water run-off is identified to be the existing culverted watercourse off site beyond the south-western site boundary. Further receptors both on and off-site are also present, these receptors are identified as:

On-site sensitive receptors to surface water and silt are identified as follows:

- Below ground surface water system, as they become constructed;
- Attenuation areas (swales and attenuation areas);
- Below ground cellular crates;
- Ecological ponds;
- Residents in completed properties (upon completion and occupation); and
- Highways on site.

Off-site sensitive receptors to surface water and silt are as follows:

- Culverted watercourse off site on the south-western boundary
- Sully Brook as the inferred nearest surface water receptor located 1km west
- The Bristol Channel at 670m distance to the south, however the Sully Brook discharges to the Bristol Channel near Barry Docks at 3.1km distance
- Wider public highway realm off site beyond construction site entrances – Steep Holm Walk to the north and Swanbridge Road to the east
- Existing offsite residential sensitive receptors.

4 RISK ASSESSMENT

A risk rating is provided as guidance to the level of risk associated with silt pollution to the surrounding water environment receptors from the identified sources. The risk rating assesses a number of risk factors in line with the source-pathway-receptor model. It assesses the sensitivity of any identified receptor and combines that a with hazard consequence and probability to classify the risk rating as high, medium or low.

High: Indicates the positive identification of a sensitive receptor and / or the likelihood of a potential risk to the surrounding environment.

Medium: Indicates the potential identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

Low: Indicates the limited identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

Based on the identified risk rating, plans will be developed and implemented to treat, control and minimise risk.

Table 2: RISK RATING AND ASSESSMENT			
Risk Factor	**Identified**	**Detail**	**Risk Rating**
Sensitive Receptors			
Visible flowing water course within 100 m of site boundary and category of watercourse.	**No**	The nearest watercourse is a culverted ditch located beyond the south-western corner, which passes through existing residential areas of Sully. The final outfall is not known but may include either Sully Brook located 1km west or the Bristol Channel located 670m south. Medium risk on account of the unknown drainage route.	**Medium**
Discharge from site flows directly into a water course	**No**	Surface water will drain via an attenuation area, to a headwall on the south-western corner and into a culverted watercourse off site.	**Medium**
Water course contains visible aquatic life (fish etc.) or has been assessed as environmentally sensitive	**No**	Watercourse off site is culverted, fish etc are unlikely to be present.	**Low**
Local water course used as local amenity, fishing, canoeing, boating, swimming	**No**	Watercourse off site is culverted.	**Low**
Likely volumes of temporary discharge will exceed those designed for the final discharge consent	**No**	Temporary run-off to the proposed surface water drainage system is unlikely to exceed calculated final discharge rates. Discharge of surface water from the site is expected to be restricted to discharge rates as agreed through planning. Attenuation areas and basins to be constructed at the start of the build.	**Low**
Consortium site with shared collection and discharge outlets	**No**	Site is not a consortium development and does not share discharge points.	**Low**
Treatment of water discharge is likely to be required to achieve the quality standard of acceptability	**Yes**	No active water treatment is currently proposed. Settlement using the basins and attenuation areas and passive mitigation is set out.	**Medium**
Designated environmentally sensitive sites and Sensitive Receptors located downstream from the development.	**No**	No downstream designated environmentally sensitive sites have been identified within 500m of the site boundary. Several designations are associated with the Bristol Channel however, these are unlikely to the affected by site storm water discharge	**Low**
Ground Conditions and Topography			
Soils investigation identifies clay / silt (impermeable materials)	**Yes**	Ground investigation indicates that the site is directly underlain by bedrock of the Mercia Mudstone Formation, comprising clay at the surface. No superficial deposits are present.	**High**
Site exposed, or at high altitude, or steep gradient.	**No**	The site has a gentle slope downgradient towards the south/south-west	**Medium**
Soils investigation identifies on-site contamination that may pose as risk to controlled waters	**No**	No significant contamination was found on site during the ground investigation.	**Low**
Groundwater level detected at installed drainage pipework depths	**No**	Shallow groundwater has not been recorded.	**Low**
Rainfall and Flooding			
Rainfall prediction in location relatively high	**Yes**	The average annual rainfall for the site area between 1991 and 2020, as provided from the Met Office, is 1,007 mm.	**Low**
Historical evidence indicates site suffers from seasonal flooding	**No**	The site is not located in a flood risk zone.	**Low**
Development Constraints			
Does the development require a programme of earthworks to change / modify site levels	**No**	No significant earthworks are required.	**Low**
Construction of attenuation basins programmed for construction within 3 months of development commencement.	**Yes**	On site attenuation basins and attenuation areas are to be built at the start of the build programme.	**Low**
Potential Pollution Risk Rating			
It is considered that the site should be classed initially as **'Moderate risk'** given: 1. The geology of the site of clay/silt rich soils, and 2. The receiving watercourse is culverted with an unclear route through developed parts of Sully, making monitoring water quality problematic. 3.			

5 SURFACE WATER POLLUTION SOURCE INVENTORY

5.1 Sources of surface water pollution during construction activities

Due to the nature of the geology underlying the site and site activities, there is the potential for suspended solids to be generated and mobilised in surface water run-off.

Table 3 provides a summary of the surface water pollution source inventory as well as associated hazards, receptors, and consequences.

Table 3: Surface water pollution sources associated with construction activities at the site

Hazard / Source	Receptor	Pathway	Consequence at Receptor
General Construction Related Activities			
Leak/spillage of hazardous material on site (e.g., oils and fuels).	Culverted watercourse beyond the south-western corner, assumed tributary of Sully Brook	Via infiltration, overland flow or via the surface water drainage system (storm system).	Discharge of hazardous substances into below ground infrastructure and the unnamed surface watercourse.
Leak of oil/fuel from pumps used as part of pumping activity.			
Discharge of water containing suspended solids (silt).		Overland flow from site boundary or discharged from the outfall.	Discharge of suspended solids (silt) below ground infrastructure and the unnamed surface watercourse.
Discharge of water containing chemicals (Flocculant) from treatment process		Overland flow from site boundary, or discharged from the outfall.	Contamination of below ground infrastructure and the unnamed surface watercourse with flocculant.
Spillage of collected solids from settlement system.		Overland flow from site boundary, or discharged from the outfall.	Discharge of suspended solids (silt) into below ground infrastructure and the unnamed surface watercourse.
Failure of pumping equipment – overflow of water from drainage etc.		Via surface flow or surface water drainage system.	
Vandalism – resulting in release of contaminants from containers.		Via surface flow.	Discharge of contaminants into below ground infrastructure and the unnamed surface watercourse.

6 SETTLEMENT TEST AND DOSING TRIAL

6.1 Introduction

To help inform appropriate mitigation and management measures for the site the settlement rate for suspended solids needs to be understood. Therefore, a sample of subsoil (in the absence of surface water on site) from the site was obtained.

Samples were submitted to Frog Environmental Ltd (an RSK company) and Siltbuster Ltd for testing of the rate of natural separation of the solid fraction (suspended solid) from the water. Where settlement rates are slow, a dosing trial is undertaken, which involves applying gel flocculant and liquid flocculant as an active silt control method, to bind the negatively charged silt particles, forcing them to drop out of suspension (formation of a floc).

Frog Environmental provided the dosing trial for gel flocculant, while Siltbuster provided the dosing trial for liquid flocculant treatment.

The use of chemical treatment is controlled by the local environmental regulatory authority (NRW). Application and approval of a bespoke Environmental Permit under the Environmental Permitting Regulation (2016) would be required prior to deploying chemical treatment (gel flocculant) at the site.

Results of the settlement test and dosing trial are set out in **Appendix B** with associated material safety data sheets (MSDS) provided in **Appendix C.**

6.2 Gel flocculant settlement test

The turbidity of each sample is measured in Nephelometric Turbidity Unit (NTU).

Natural settlement rate of the sample obtained from the site, measured over a 24hr period is set out in **Table 4**.

Table 4: Natural Settlement Rates

Sample Location	Initial Turbidity (NTU)	NTU after 10 min settlement	NTU after 30 min settlement	NTU after 24-hr settlement
Site Subsoil	709	571	563	163

Results of the natural settlement test, indicate that settlement did not produce clear water even after a 24hr period. Unless large amounts of attenuation can be utilised and weather and flow managed over multiple days, natural settlement is unlikely to be feasible on the site. Therefore the application of a flocculant will be required to aid settlement.

6.3 Liquid flocculant settlement test

The turbidity of each sample is measured in Nephelometric Turbidity Unit (NTU).

Results of the natural settlement test, provided a synthetic settlement profile for the site. Results of which are provided in the Siltbuster report contained within **Appendix B**.

6.4 Dosing Trial

The testing of chemical treatment, via a dosing trial, is undertaken alongside a control sample. Samples are tested against different gel flocculant blends with reaction times and flocculant type recorded.

Samples are agitated repeatedly to gain a good indication of the reaction time required to settle the suspended solid. Frog Environment Ltd (an RSK company) then report the most effective blend of gel flocculant chemical treatment.

Where the use of gel flocculant is recommended, the use and implementation of it on site will be dependent on location of use and flow rates and will likely alter throughout the construction process, with 'fine tuning' to the deployment required.

Testing of samples indicated that a gel flocculant blend of product Gel - 494 and Gel – 360 would be the most effective. Testing indicated that a three stage application will reduce the turbidity to 216 NTU. This indicates that further settlement and a polishing channel would be required to achieve clean and clear water.

The application of the gel flocculant will be designed so that, where required, surface water can be dosed three times (recommended number of stage application) and a suitable settlement distance allowed for, prior to surface water discharge. This is to ensure that all gel flocculant and bound sediment remains within the site boundary. The designed use of gel flocculant based chemical treatment will be such that only surface water is discharged from the site and that the gel and sediment remains within the site boundary.

Indicative treatment locations have been considered so that the sediment settles out prior to or, as a last resort, within the attenuation area. Potential dosing points have been chosen as gel flocculant blocks placed within the below ground drainage infrastructure or at dosing points in the storage swales, prior to reaching the attenuation area. The number of active dosing points will be dependent on the build phasing and lines requiring treatment. The number of dosing points will be frequently reviewed to ensure that the water flowing to and within the basin is sufficiently dosed and not overdosed. The use of a silt capture channels has been included to provide a final filter for surface water and to capture the spent flocculant and bound sediment.

Each inlet and bay within the attenuation area and the silt capture channels will be frequently cleaned out to removed settled flocculant and sediment to prevent remobilisation.

The deployment locations and quantity of gel flocculant blocks will be reviewed at key build milestones to ensure that treatment locations are appropriate to works being undertaken and the associated level of risk.

The dosing trial for the liquid flocculant identified that 99.5% of the total suspended solids level can be removed (from a synthetic level of 1,356 mg/l TSS). The dosing trial confirmed that using an aluminium based coagulant and then anionic flocculant followed by gravity settlement will provide excellent TSS reduction and achieve a visually clear water.

The liquid dosing trial concluded that elevated total aluminium concentrations in the synthetic wastewater sample is not likely after treatment.

7 PROTECTION MEASURES WITHIN ACTIVE WORKS AREAS

The ‘active works area’ refers to each of the areas set out in this report that is undergoing intrusive ground works, that has the potential to impact surface waters.

The primary source of sediment and sediment-contaminated surface water will be generated during the excavation, stockpiling of soils, below ground infrastructure construction and through general plant movement.

Without adequate sediment mitigation and segregation of the works area from drainage infrastructure (inclusive of basins, swales and crates), there is the potential for controlled waters to be adversely affected by sediment contamination. The following section sets out proposed prevention and mitigation measures to address potential risks. The prevention and mitigation measures are illustrated on **Figure 2.**

Please note that if conditions change that result in the potential for surface waters leaving the site boundary, or changes in works to those proposed at the site, reduces the efficacy of installed measures, then the silt mitigation must be reviewed, and additional measures implemented as necessary.

7.1 Work Area

The following key points are noted and measures are recommended for implementation during the construction works. Measures should remain in place until all construction works within that associated area, are completed and good vegetation cover is established.

7.2 Boundary protection measures

- Silt fencing should be installed as per the site wide mitigation plan contained within **Figure 2**. Silt fencing should be installed along the north-eastern boundary to protect the ecological ponds on the assumption that these are off line and will be constructed at the start of the build programme as BNG.
- A silt fence should also be installed along the topographically down-gradient boundaries along the western and southern margins, to protect from surface water runoff to the pedestrian footpath to the west, and existing residential properties to the south-west.
- Silt fencing is to comprise a semi-permeable membrane staked at regular intervals with typical installation details presented on **Figure 2**. Importantly, the base of the membrane on silt fencing should be buried to prevent surface water from passing beneath it. For longer term protection and to reduce maintenance requirements, the fence installation would benefit from stockproof wire mesh to reduce wind damage to the membrane.

7.3 Rain gardens

- Highway drainage will be managed under SAB using rain gardens. It will be important that during the construction phase, surface water runoff can enter the rain garden. To achieve this, sections of the curb line will need to be removed.
- The rain gardens should be lined with silt matting to prevent soil remobilisation during the construction phase.

7.4 Headwall protection

- Headwall protection should be fitted at all significant headwalls as shown on **Figure 2**. This includes headwalls where swales are culverted beneath access roads, headwalls from significant areas of permeable paving and all headwalls to the attenuation area. Headwall protection should consist of coarse angular stone placed in a wire gabion style basket. Baskets should be tight fitting between the headwall wingwalls and lined with silt fence material. Rock check dams as a both a sediment trap at the headwalls and dissipates energy of the water flowing into the attenuation area. Straw bales must be avoided for this form of protection.
- Numerous smaller headwalls will be present to allow for smaller scale runoff from individual units to enter the perimeter swales. It is not practicable to fit the aforementioned protection to these smaller headwalls. For these, straw bales placed at in front of the outfall will be sufficient.
- A forebay should be installed in front of the final outfall from the attenuation area, prior to the final hydrobrake. This should be formed of a clean gravel/aggregate bund.
- All significant headwall protections are presented on **Figure 2**.

7.5 Attenuation area compartmentalisation

- The attenuation area in the west/south-west of the site should be compartmentalised as shown on **Figure 2**. This should comprise two soil bunds with high level overflow pipes (minimum 300mm diameter) as presented. The soil bunds should not be formed of sub-soil. The bunds should be of sufficient height to cover the width of the attenuation area. The purpose of the compartments is to allow suspended solids to settle and compartmentalise silt rich waters preventing the whole of the attenuation area from becoming impacted with silt water.
- A third soil bund should be established on the southern edge of the attenuation area as shown on **Figure 2**. This bund should include two high level overflow pipes (minimum 300mm diameter).
- The sides of the attenuation area should be seeded to prevent silt remobilisation.

7.6 Polishing channel

- As shown on **Figure 2**, the southern, linear section of the attenuation area, should be used as a polishing channel. The soil bund placed at the northern end of the polishing channel will allow surface waters to convey through a lined polishing

channel. The channel should be lined using flocculant matting for its entire length. Only the low flow section of the channel needs to be lined with matting.

- Silt wattles should support the polishing channel at regular 10m intervals.
- A final forebay should be established at the southern end of the polishing channel of clean gravel/aggregate.

7.7 Swale compartmentalisation

- Similar to the attenuation area, the linear swales 1, 3, 4, 5 and 6 should be compartmentalised at regular 25m intervals. Soil bunds or clean grave/aggregate with overflow pipes should be fitted. A silt mat should be placed on the down-gradient side of each bund/pipe outfall.

7.8 Passive recirculation chemical treatment measures

- To supplement the removal of sediment by passive treatment measures, gel flocculants may need to be considered, particularly during winter months, in the following passive treatment measures across the development site.
- Deployment locations for measures containing gel flocculant, shall be required within the below ground drainage infrastructure feeding the on site attenuation area, as presented on **Figure 2**, to assist natural settlement rates, where settlement by natural means is not sufficient.
- Alternatively, or where additional treatment is deemed necessary, water will be circulated through an inline pipe reactor (containing flocculant gel blocks) to remove sediment from waters within one of the attenuation area compartments, prior to discharge to the polishing channel.
- A sample has been obtained from the site for settlement testing and dosing trials. These have been used to inform appropriate dosing rates and the most effective gel flocculant combination.
- Design of chemical dosing mitigation measures will be provided if confirmed to be appropriate by the developers. The design of the chemical dosing will be dependent on surface water flow rates to ensure that the water is not over dosed and that an appropriate distance is maintained, post dosing, to ensure that all gel flocculant remains within the site boundary.

- **Active liquid treatment system**
- Due to the potential for water containing suspended solids to be generated during heavy rainfall events, active treatment measures may be deployed (as required and under appropriate approval from NRW) to supplement passive treatment systems. The proposed active chemical treatment system will assist with removing suspended sediment prior to discharge.
- There will be no interaction between chemicals utilised in the passive and active treatment systems, where necessary the gel flocculant blocks are be removed if replaced by a liquid system.

- The active treatment measures will include liquid flocculant, coagulant and pH balancer pump and treat system.
- The active treatment system will be located in the southwestern area, close to the attenuation area with waters pumped directly from the basin. The treated waters will then be discharged from the active treatment cell, via a clarifying unit and through a pipe to the polishing channel.
- The active pump and treat system would typically comprise two WTS20s and SRT10 lamella clarifiers, utilising liquid flocculant, coagulant and pH balancer. The WTS20s comprise a pump passing water through a chemical pre-treatment system, which will dose incoming water with a flocculant, coagulant, and a pH balancer (if required). The dosing rate will vary depending on the incoming volume of suspended solids within the water as it is automatically analysed, and the dosing adjusted accordingly.
- The dosed water will then be distributed into SRT10 lamella clarifiers utilising a gravity based settlement system, which will remove the particles from suspension and capture them within the individual settlement tank units.
- The treated water will then be discharged from the treatment system and transferred via dedicated pipework to the polishing channel to the designated discharge point.
- The active pump and treat system will utilise polyaluminium chloride as a coagulant and the anionic polymer AQ2084 (otherwise known as Aquatreat 2084) as the flocculant. If required, a pH balancer (sodium hydroxide) will be included into the treatment process to ensure that pH levels of water discharged from the treatment system do not fall below pH 6. Copies of the material data safety sheets (MSDS) for these components are presented in **Appendix C**.
- Depending on site conditions, the pumps supporting the liquid flocculant, coagulant and pH balancer pump and treat system will operate on a float switch or manually.
- The active treatment system incorporates a telemetry unit for measuring water quality and suspended sediment levels prior to discharge through the clarifier.
- Active treatment systems (including supporting pumps and pipework) will be monitored and maintained in accordance with the manufacturer's recommendations. Once set up and commissioned, the equipment supplier will provide full training to the site operatives detailing operational, management and maintenance procedures. The equipment supplier will ensure that sufficient training is received prior to discharging waters from the site.
- When operational, the active treatment systems will be visually inspected on a daily basis by the site management team or other appointed person.
- Additional monitoring will be undertaken as required during periods of higher use, such as during periods of heavy rainfall.
- Should any evidence of faults be identified the treatment and discharge will be suspended and suitable expertise from the supplier sought to address any issues or concerns prior to restarting the treatment process.

7.8.1 Use of flocculants

- The deployment and use of flocculants, coagulants and pH balancers will be undertaken under appropriate approval from NRW, via a Bespoke Environmental Permit.
- Where employed, all flocculants, coagulants and pH balancers present on the site will be deployed and utilised in accordance with the manufacturer's instructions.
- Depending on site conditions and requirements, flocculants will be deployed in pump assisted (active) systems via means of an inline pipe reactor, containing gel flocculant blocks. The gel flocculant in line pipe reactor may be used to circulate and treat water within the attenuation area, prior to the polishing channel. The length of the polishing channel will be defined by the flow rate of the water to ensure that all gel flocculant and sediment has the required time to settle, within the site boundary. This will ensure that only water is discharged from the site boundary, leaving sediment and spent gel flocculant to be managed within the site boundary.
- The placement and use of the flocculant, where deemed necessary, to remove sediment from surface water prior to outfall as effluent, will be designed so that surface water can be dosed with appropriate flow rates. This will be designed to provide maximum efficiency so that the lowest amount of flocculant can be used, and to ensure suitable attenuation is provided for the flocculant and sediment to drop out of suspension, within the site boundary, prior to discharge. Gel Flocculant will be used within the storage swales prior to the attenuation basin and potentially below ground infrastructure ahead of the basin. The exact locations will be determined based on site progress and requirements. Treatment via the use of gel flocculant will provide secondary measures to the primary mitigation detailed above.
- The use of the liquid treatment unit will be determined by on site water attenuation capacity, which can be increased while topsoil and vegetation is stripped, prior to infrastructure being constructed, and during heavy rainfall events. The treatment unit would be established and set up in the southwestern corner of the site.

7.9 Material Management

- Stockpiles should be sealed to prevent water ingress and have a silt fence placed around the base to prevent runoff from mobilising sediment downgradient. Stockpiles not required for future development should be removed from site as soon as possible.
- Any soil stockpiles maintained on site should be located within a designated area as far as practicably possible from surface water courses and site boundaries.
- Dewatering of excavations should be undertaken via a pump to pumping cell comprising a silt sock or dirt bag (dewatering bag), situated on a bed of gravel and a pallet, within an area of soft landscaping. The pump cell should be surrounded by silt fencing to capture any remaining sediment. Pump cells should be set up in an area of soft landscaping away from the active works area and away from disturbed soils. Alternatively, water can be dewatered to the proposed attenuation area (once compartmentalised).

- Topsoil and subsoil should be replaced in the order they were excavated. Large areas of bare soils should be hydroseeded if climate and seasonal conditions allow or covered with erosion control blankets (coir) while vegetation regrows. This will limit sediment mobilisation from surface water runoff.
- Ensure that any pre-existing voids or openings, such as land drains, identified in any of the excavations, which could provide a preferential flow pathway for site drainage are blocked and sealed.

7.10 Daily considerations by the site team

- Regular review of the effectiveness of silt management measures to ensure that sediment is not building up behind the silt fences making them ineffective.
- Continued monitoring of run-off generated from access roads throughout the development site to identify whether the run-off contains silt.
- Continued implementation, review, and revision to the site's traffic management plan.
- Continued implementation, review and revision to the site's emergency spill procedure.
- General good housekeeping of the site.

7.11 General management control measures

In addition to the above area specific measures, the following procedural and management control measures shall be implemented with due consideration to site activities, build programme and commensurate to the associated risk posed by site activities:

7.11.1 Soil stockpiling

- Utilise topsoil/subsoil stockpiling procedures to ensure that the number and condition of stockpiles maintained on-site are closely maintained and monitored in accordance with DEFRA guidance on best practice guidance for topsoil storage during the construction phase.
- Locating stockpiles in designated areas as far as practicably feasible, away from the sensitive water receptors, including the existing watercourses and surface water drains. Where this is not practicable these stockpiles should be bunded with the addition of silt fences.
- The number of stockpiles maintained on-site will be regularly reviewed and superfluous material, not required to support site operations, will be removed from site for subsequent re-use or disposal at suitably licensed facilities.
- Where required, silt fencing shall be installed around the base of stockpile(s) to control run-off.
- Where required or applicable, stockpiles shall be seeded or covered with an appropriate covering to provide additional stability, prevent water ingress, and reduce the potential for sediment run-off and dust generation.

7.11.2 Site access roads, surfacing and vehicle movements

- Early installation of suitably surfaced access roads to provide a clean running surface and reduce vehicle movements over bare/exposed ground (e.g., gravel cover).
- Install a suitable running surface along any temporary access roads to reduce the likelihood of soft ground disturbance generating sediment run-off (e.g., gravel cover).
- Establish, maintain, and review vehicle movement routes across the site.
- Minimise, as far as practicable, the movement of machinery on and off-site access roads to prevent tracking excess soil onto roads and highways.
- Prevent, as far as practicable, the movement of machinery on undisturbed ground, such as retained areas of vegetation.
- Utilisation of a road sweeper, or other suitable road cleaning equipment, on-site roads and surrounding public highways where necessary. Frequency of road cleaning to be continually assessed and updated as appropriate to address site conditions.
- Install a suitable surfacing in construction material storage areas, site compound, contractor car parking areas and key access points to each development phase (i.e., gravel cover).

7.11.3 Vegetation retention & growth

- Replacement of topsoil and landscaping of completed areas shall be undertaken as soon as practicable following their installation (season permitting).

7.11.4 Hazardous material storage

- All hazardous materials, including fuel, oils will be stored in suitable containers within an appropriately bunded area and situated on impermeable ground.
- Mortar silos will be located in designated areas away from surface water receptors and securely bunded to prevent surface water run-off.

7.11.5 Spillage control

- A supply of surface water protection and silt management equipment; including spill kits, silt mats, coir rolls and silt fence, will be maintained within the site compound / material storage for rapid deployment in the event of an emergency. If necessary, a supply of materials will also be maintained next to any temporary works being undertaken in sensitive areas, such as in close proximity to a surface water course or a location where surface water run-off has the potential to circumvent installed protection measures.
- Maintain sufficient bungs on-site to install in discharge pipework and prevent discharges from surface water detention basins in the event of an emergency. Due to the potential for working near flowing water, bungs should only be installed when safe to do so.

7.11.6 Installation of physical control measures

The physical control measures discussed above will be installed in a phased approached determined by activities being undertaken across the site and the associated levels of risk posed to identified sensitive receptors.

7.11.7 Maintenance of physical control measures

Installed physical control measures discussed above shall be maintained throughout the construction period and for the duration that a risk to the identified receptors remains.

Condition and efficacy of physical control measures will be monitored and those measures, such as silt fencing and silt curtains, shall be replaced and repaired as required to ensure continued efficiency.

7.11.8 Removal of physical control measures

The site management team will undertake weekly reviews of protection measures installed at the site and whether the level of protection remains commensurate to risks posed by site activities. When required, advice shall also be sought from specialist environmental advisors.

Physical control measures will be removed in a phased approach determined by the residual risk posed to sensitive receptors.

In areas of the site where development activities have ceased, physical control measures will be reduced commensurate with the lower risk.

Complete removal of physical control measures will only be undertaken when the risks posed to sensitive receptors from construction related activities is negligible.

7.12 Site personnel and documentation

The following measures are recommended for implementation to increase awareness and bring existing site documentation up to date:

- Include a detailed section relating to surface water and silt protection within the site induction folder for all phases of the work.
- Continued documented review by the site management team of the existing site conditions in relation to this CSWMP and update the requirements on a routine basis.
- The site management team or principal contractor on site to undertake documented weekly (daily during periods of heavy rainfall) site inspections and obtain support from the appointed Environmental Consultant if/when required.
- Conduct a site pre-start meeting with all relevant parties to agree methods of working to control surface water and silt management.
- Undertake additional detailed site-based awareness training (Site Briefing / Toolbox Talk) on surface water and silt management and protection for all pertinent site staff including groundworkers. Clear guidance should be given on the mitigation measures discussed.

Actions reported for project personnel include:

Technical team:

- Ensure this CSWMP is communicated to the site management team and updated as necessary.
- Undertake regular reviews of site inspection documents to identify potential areas where additional protection is required and communicate this to both the site management team and to their appointed environmental advisor.

Site managers / Principal Contractor:

- Review contractor method statement for works in and around surface water features and obtain advice from the appointed Environmental Consultant.
- Undertake environmental monitoring of the on-site and offsite surface water features.
- Ensure the measures presented within this CSWMP are implemented by the site construction contractors.
- Brief sub-contractors and site operatives on effective water management and their responsibilities.
- Undertake weekly documented inspections and checks to ensure the effectiveness of the pollution prevention measures, especially before, during and after heavy rainfall events, adverse weather and during the wetter seasons (winter and spring).
- Undertake weekly monitoring inspections of the condition of the watercourse, downstream from the site, ensuring pollution events are not occurring and reporting any degradation in condition.
- Key monitoring points have been identified as:
    a. Site entrance where the site access meets the existing highway;
    b. Existing watercourse along the site boundary;
    c. On site attenuation basin;
    d. Final surface water chamber prior to water leaving the site boundary; and
    e. Fuel and chemical storage areas including mobile plant locations.

Contractors:

- Ensure that this CSWMP is communicated to all relevant site teams and groundworkers.
- Ensure appropriate water management controls are included in relevant risk assessments and method statements, as well as detailed arrangements regarding increased supervision and management during adverse weather, or large scale works that may impact upon the drainage basins / surface watercourses.
- Ensure gully protection is fitted as soon as the surface water drainage system is completed and thereafter maintain the gully bags until completion of the construction phase.
- Report any damage to silt mitigation features (e.g. silt fencing) as a result of plant movement or work and arrange for repairs to be made as soon as practicable.

- Follow and implement water management and pollution prevention controls as instructed by the site manager and identified in the risk assessment/method statements (RAMS).
- Immediately report to the site manager if pollution prevention measures are not in place, are damaged or ineffective, or if works results in a silt release to surface water or the storm water sewer system.
- Report any environmental incident or near miss to the site manager immediately.

7.12.1 Maintenance activities

- Replacement / repair of storage equipment and site equipment/plant containing hazardous materials (e.g., fuel and oils) if damage or evidence of leaking is observed.
- Site plant will be inspected routinely for damage and wear by plant users.
- Any defects noted by site personnel will be reported to the site management team so repairs can be scheduled.
- All plant items and equipment will be serviced and maintained with due regard to the manufacturer's recommendations in order to minimise the risk of breakdown or leaks.

7.13 Dewatering of excavations

Dewatering of excavations during the pre-construction works without appropriate water treatment can result in significant pollution of controlled waters. It should be reiterated that if dewatering is required then dewatered silt-contaminated surface water should not be discharged into the surface water system, or directly to the off-site water courses. The NRW regulatory position statement (RPS) "Temporary dewatering of excavations to surface waters", January 2023 requires discharged water to:

- Be clean water, for example clear rainwater or infiltrated groundwater which has collected in the bottom of temporary excavations.
- Not result in water containing fine or coarse suspended solids (silty water) entering surface water.
- Not last more than three consecutive months (the activity may stop and restart, but the clock does not restart) – if the activity is likely to go over three consecutive months, then a permit must be applied for.
- Be made to surface water, such as a river, stream or the sea.
- Have a method statement that minimises the risk of pollution.

The discharge must not:

- Pollute surface water.
- Contain any chemical dosing agents, flocculants or coagulants.
- Be from a site which is contaminated by oil, metals, hydrocarbons, solvents or pesticides or other polluting substances.
- Result in the spread of non-native invasive species, parasites or disease.
- Cause flooding from surface water.
- Cause erosion of the banks or bed of the receiving watercourse.

- Contain concrete wash water even if it has been treated.
- Contain site drainage from surface areas such as haul roads, storage or working areas.
- Be from a site with naturally elevated concentrations of substances which exceed environmental quality standards.

If active pumping of water from investigation trenches is considered, care needs to be taken that water will not be discharged direct to surface water drains without prior treatment to remove silt to <60 mg/l.

Importantly, following three months, a bespoke environmental permit should be required for continued pumping and discharge of surface water, during the construction phase. The statutory appraisal time for permit applications may be up to 12 months.

8 SITE MONITORING PROCEDURES AND RECORDS

8.1 Surface water monitoring

The following monitoring procedures should be carried out on a regular basis (at least weekly, and during/immediately following a storm event) by the site management team to enable continuous review of the measures listed above.

A comprehensive record of the effectiveness of surface water management measures will be maintained to enable further review by any parties attending site. Examples of site monitoring checklists (proformas) are included in **Appendix D**. Key monitoring points have been identified as:

- Site entrance where the site access meets the existing highway (Steep Holm Walk and Swanbridge Road),
- On site attenuation basins to the north,
- South-western attenuation area,
- Final discharge point from the site at the headwall from the attenuation area, and
- Fuel and chemical storage areas including mobile plant locations.

The site management team should undertake routine inspections of the wider site to monitor and keep records of the watercourse water quality, water quality at the final outfalls any other environmental issues. The inspections will continue on a regular basis for the duration of the project with records kept. It is recommended that daily inspections are completed for the outfall to the offsite culvert.

Regular inspection of implemented surface water and silt management measures (e.g., silt fencing and headwall protection measures).

Regular inspection of all gullies and conditions of the public highway at site entrances.

All records should be reviewed on a regular basis, but advice can be obtained by the site management team at any time from an appointed Environment Consultant (RSK).

Calls to the appointed Environmental Consultant (RSK) should be made in the event of heavy rainfall breaching protective measures or silt pollution incidents being recorded.

To enable a prompt response to changing site conditions, it is advisable to ensure a supply of silt fencing and silt matting is readily available to implement emergency measures.

A comprehensive record of the effectiveness of surface water management measures should then be maintained to enable further review by any parties attending site.

Any emissions to surface water identified will result in the implementation of the protocols detailed herein. Any complaints in relation to surface water emissions will be fully investigated as detailed in the following sections. The resultant actions will be recorded in site records.

8.1.1 Meteorological conditions

Meteorological forecasts and weather conditions (including precipitation) which could result in increased run-off will be monitored. Records of significant weather conditions, such has high precipitation and named storms, and their impact on the site will be maintained.

Additional reviews, and implementation of additional site management measures will be undertaken in response to significant weather event forecasts.

8.1.2 Regular inspection and monitoring

Visual monitoring techniques will principally be used within the boundary of the site. These may be supplemented by the collection of water samples from designated surface water monitoring points.

Regular visual inspections of surface water discharge quality as well as the overall condition of the wider site will be undertaken as part of general site walkovers completed by the site management team and site operatives during their daily tasks.

Additional monitoring beyond the site boundary will not be feasible due to the culverted nature of the watercourse off site. All monitoring will be carried out in cognisance of the prevailing weather conditions and site activities.

In addition to this, weekly routine inspections of the site to monitor and record surface water run-off quality and other environmental issues will be undertaken by the site management team or other appointed person. Records of these inspections will be kept for the duration of the project for reference.

The Client's safety, health, and environment team will also undertake monthly inspections which will include the condition of internal roads, adjacent public highways, and any immediate surface water receptors.

Inspection frequencies will be increased as required in response to prevailing meteorological conditions.

8.2 Water sample collection and testing

To supplement the regular visual inspection and monitoring of surface water discharges from the site, instantaneous (spot) samples of discharged water may be collected by the site management team (or nominated deputy) for analysis to confirm it adheres to emission limits presented in **Table 5**.

Sampling will be undertaken at the active discharge point from the attenuation area in the south-western corner prior to the culvert. To ensure consistency, NGR's for sampling points should be taken as the discharge points.

Due to the culverted nature of the watercourse off site and the absence of an 'upgradient' watercourse, monitoring the water quality inspected from upstream and downstream locations from the operational discharge point will not be possible.

Table 5: Discharge Point Monitoring Parameters and Limits

Parameter	Limit (Including Unit)	Compliance Statistic
Total suspended solids (TSS)	60 mg/l	Maximum
pH	6 to 9	Minimum and maximum

Water samples should be collected at regular intervals, with sampling frequencies increased accordingly during periods of higher rainfall. If there is no water being discharged at the time of sampling, this will be recorded in inspection records.

Where confirmation is required to determine if a potential surface water emission has occurred, supplementary monitoring should be undertaken. This should comprise of measuring Total Suspended Solids (TSS) directly or recording turbidity (NTU) of discharged water using a suitable monitoring device, such as a portable turbidity meter.

Additionally, a portable pH meter should be utilised as required to provide an on-site indication of the pH level of water being discharged from the site.

8.3 Site records

In addition to regular site monitoring, the following significant events at the site will be recorded:

- Maintenance.
- Breakdowns.
- Emergencies.
- Site inspections.
- Despatch of records to NRW.
- Severe weather conditions.
- Complaints received.
- Visitors to the site.

The site management team or nominated person(s) will maintain a record of all the above information in the site log, on inspection forms, or as part of wider environmental management records. They are also responsible for ensuring that silt management measures are maintained and repaired, as required.

Records relating to significant events will be kept for up to 6 years or until construction activities have been completed. Events may include off-site environmental effects or pollution of land or water.

All records and copies of inspection forms will be maintained and will be made available for inspection at all reasonable times by any authorised officer of NRW.

9 EMERGENCY PROCEDURE AND COMPLAINTS HANDLING

9.1 Emergency Procedure

Supplementary surface water protection measures or off-site removal of surface water shall be deployed as necessary to provide additional surface water treatment/containment/management capacity.

If required, advice should also be sought from specialist environmental advisors.

9.1.1 Spillage emergency procedure

In the event of a liquid spillage/leak the following actions will be taken, where appropriate:

- Report the occurrence to the site management team immediately;
- Trained facility operatives to take immediate action to try and contain the spillage/leak where it is safe to do so using appropriate materials (such as spill kits);
- If it is safe to do so, the cause of the spill or leak will be isolated and/or moved to a bunded area;
- Inert material such as clay or sandbags are to be used to make a temporary containment bund to prevent pollution of any water or land;
- Drainage covers will be installed over any road gullies to prevent ingress into the site's drainage system;
- Access to the immediate area will be restricted until a disposal/clean up solution is implemented;
- If the spillage cannot be contained using approved methods, senior management will be contacted immediately, and specialist advice and help will be sought; and
- If a vehicle is identified as leaking, wherever practicable, it is to be stored on an impermeable pavement within a bunded area, where the spillage can be contained until such a time as the vehicle is repaired.

Once the spillage has been contained the site management team will make necessary arrangements for the appropriate removal of the spillage from the site.

Any incidents or near misses should be reported as soon as possible so that the appropriate environmental advisor is notified as soon as possible. Where damaged or missing protection measures have been identified, the site manager should implement repairs or replacements as soon as possible.

Report any environmental incident (such as silt ingress to the culverted watercourse) through the appropriate Principal Contractor emergency contact procedures, to a designated coordinator who will contact / report the incident with NRW where necessary.

Site staff should immediately report to the site manager if pollution prevention measures are not in place, are damaged or ineffective, or if works results in a silt release to surface water or the storm water sewer system.

9.2 Complaints process

Any complaints received at the site or via the regulatory bodies (including the NRW and Local Authority), will be recorded and investigated via a combination of visual inspection at the location of the complaint and collection of water samples for analysis to determine the source of the pollution to be identified.

Where possible, as much information and detail about the complaint will be recorded, whether this be from the relevant authority or complainant. This information will assist the investigation in determining the source of the surface water pollution.

Should a complaint be received, the following information will be gathered and recorded:

- Complaint details (including the address of the complainant where possible) and the location where surface water pollution is perceived;
- Weather conditions including rainfall levels;
- Results of the latest round of monitoring carried out by site personnel;
- Operational status of the site (noting any abnormal conditions that may have caused the complaint);
- Inspection of site conditions upon the receipt of a complaint (where feasible); and
- Details of the proposed corrective action, if required.

A subsequent follow up to the complainant shall be provided, detailing whether the corrective action, if required, was successful. If not, details shall be set out of any new strategy implemented, until the issue is resolved.

Records of complaints received will be kept for inspection and review by both internal and external personnel.

In the event that surface water discharges from the site are found to be causing a pollution incident – as determined by investigation into off site complaints or during routine monitoring, the following measures will be taken to confirm the source:

- Supplementary monitoring will be undertaken to identify the extent and potential cause of the event i.e., damage to perimeter protection measures or fault in treatment system;
- Examination of the operational activities at the site at the time of the complaint or event identification;
- Examination of the meteorological conditions at the time of the complaint or event identification;
- Examination of the process conditions via the plant operational records / telemetry (where recorded);
- A review of the operational procedure, process controls and the instigation of any control measures immediately following identification of the pollution; and
- Further visual monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

All complaints will be investigated however, direct calls to site from complainants will allow for an immediate response and investigation. However, it is the site management team's experience that complaints submitted to regulatory authorities can sometimes be made long after the occurrence of a surface water pollution event. This can result in a delayed notification to the site management team and commencement of investigation works. Due to the transient nature of surface water pollution and meteorological conditions, this may result in the pollution pathway being unidentifiable.

FIGURES

FIGURE 1 SITE LOCATION PLAN

PRELIMINARY REVISION
TO BE REVISED

Rev	Date	Amendment	Drawn	Chkd	Appd
P01	25.03.26	First Issue	AS	##	##

Site boundary

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Client: Taylor Wimpey South Wales

Project Name: Sully Phase 2

Description: Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	316176, 168285	316099	11101	P01	316099-BL-111-XX-D-G-11101-P01

FIGURE 2 CONSTRUCTION SURFACE WATER MANAGEMENT PLAN

Monitoring Rationale:

Primary Monitoring Locations:
M1 -

Secondary Monitoring Locations:
M# -

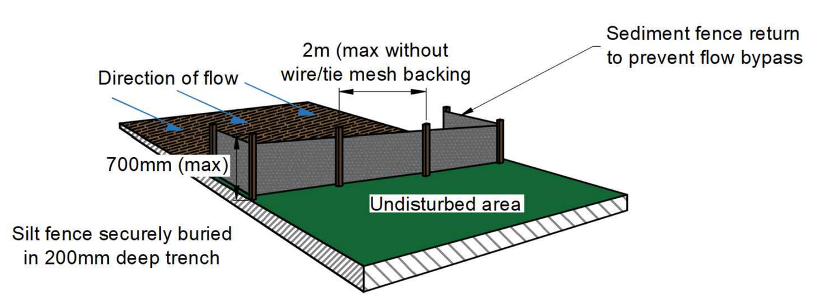
Road and Gulley Condition:
Monitor the road surface condition (for track out) and the condition and effectiveness of road gulley protection measures within the active construction areas.

Stockpiles:
Monitor each stockpile to ensure no surface water run-off is occurring. Assess the requirement for placement of silt fencing at the base of the stockpile to control run-off.

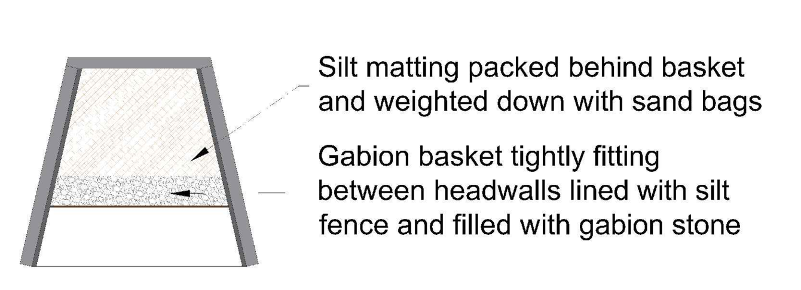
Excavations:
Monitor any excavation to ascertain whether surface water has begun to flood the excavation/ these are already flooded and at risk of over-topping, and therefore whether there is any requirement for the placement of bunds or silt fencing up-gradient of the excavation to control run-off.

Contingency:
On site storage / availability of silt fencing and silt matting to enable deployment at short notice if required (i.e., during inclement weather) and to facilitate on-going maintenance of potential installations.

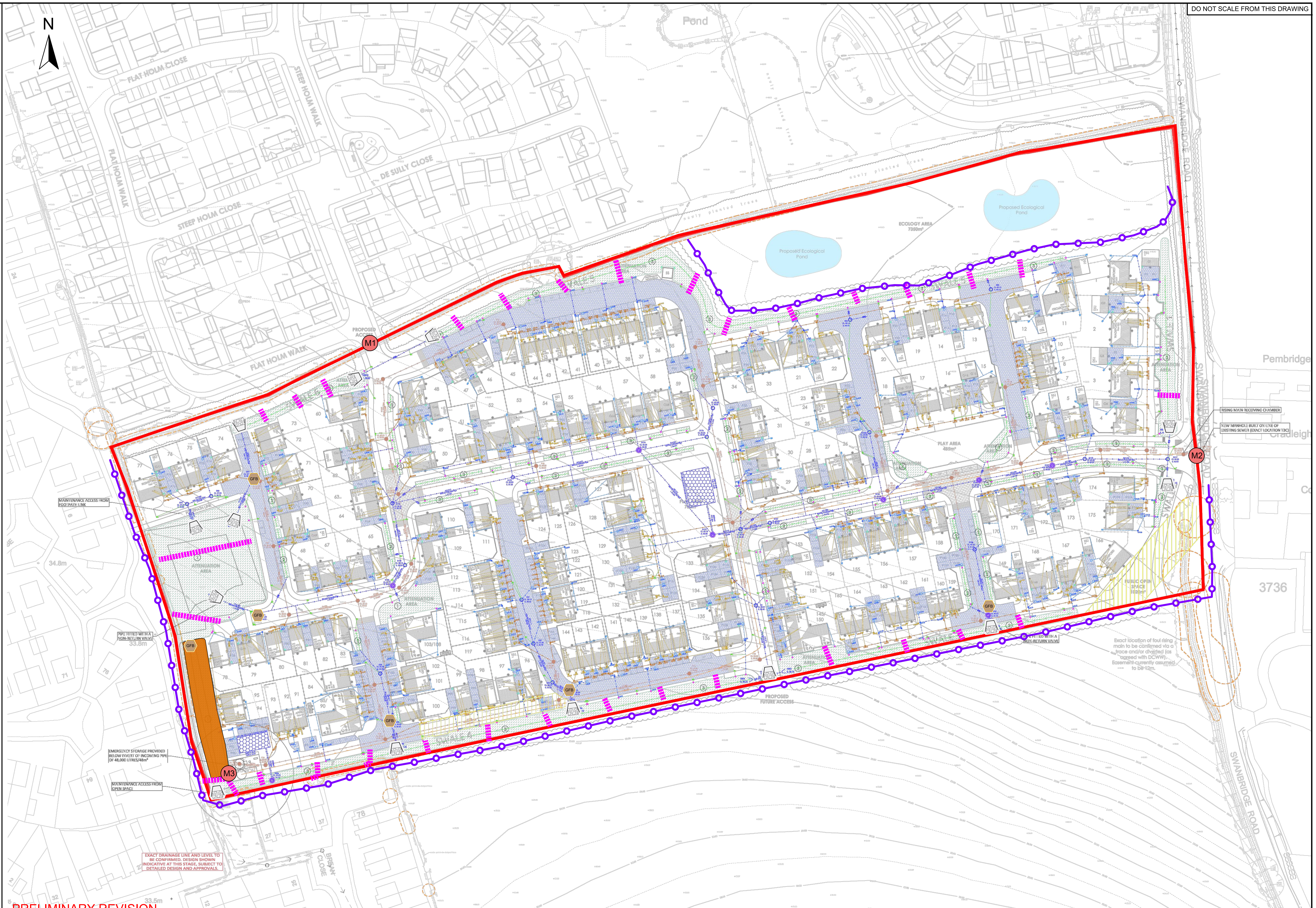
Silt Fencing



Rock Filter Check Dam



DO NOT SCALE FROM THIS DRAWING



P01	25.03.25	First Issue	AS	##	##
Rev	Date	Amendment	Drawn	Chkd	Appd

LEGEND

- Site boundary
- Surface water drainage
- Foul water drainage
- Permeable block paving
- Drainage easement
- Recommended line of silt fencing
- Compartmentalisation of SuDS feature with high level overflow pipe (min. 300mm diameter)
- Installation of a polishing channel with silt matting and wattles
- Rock filter check dam
- M1 Primary monitoring location
- GFB Gel flocculant blocks

Notes:
The schematic drawing is not meant to be an accurate engineering drawing but is used to present the general relative locations of features on, and surrounding, the site. Features annotated on this schematic are not drawn to scale but are centered over the approximate location. Such features should not be used for setting out, nor should it be considered a schedule and should be considered indicative only.
Details (such as height, width or depth) of mitigation features such as bunds, grips or ditches shall be designed by the temporary works designer, accepted by the principal designer and recorded on the temporary works register in accordance with BS5975.

RSK shall not be liable for the use of this drawing, or the information contained within, for any purpose other than that which it was provided.

Base plan provided by client
Drawing Ref.: 181102-PH2-D-002-Drainage Strategy (Rev K).

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Client	Taylor Wimpey South Wales
Project Name	Sully Phase 2
Description	Surface Water Management Plan
File Name	316099-BL-276-XX-D-G-27601-P01

Dimensions	Scale	Size	Project ID	Drawing no.	Revision
m	NTS	A1	316099	27601	P01

APPENDIX A
SERVICE CONSTRAINTS

APPENDIX A
SERVICE CONSTRAINTS

1. Service Constraints

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

2. Service Constraints where the Report provides an intrusive assessment of ground conditions:

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent

of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

3. Service Constraints where the Report relates to Surface Water Management:

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.

3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibly for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

4. Service Constraints where the Report relates to Waste Management:

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK's assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the

comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

5. Service Constraints for Construction Environmental Management Plan Reports:

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

6. Service Constraints where the Report relates to Ground Gas Membrane Verification:

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/ radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

7. Service Constraints for Environmental Due Diligence (EDD)Reports:

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.

7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

8. Service Constraints for Ground source heat energy Reports:

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

9. Service Constraints for Water Abstraction Borehole Reports:

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.

APPENDIX B
GEL FLOCCULANT TRIAL

Clear thinking
for cleaner water

Frog Environmental

Settlement test and flocculant validation report

RSK Geosciences
Sully Phase 2
FC7745
30 March 2026

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info@frogenvironmental.co.uk
frogenvironmental.co.uk

Company number: 973815

Project disclaimer

The use of flocculants on site requires permission from the local regulatory authority. Proceeding with deployment of Gel Flocculant without regulatory permission is not advised.

Whilst Frog Environmental provide advice on product specification and deployment, we are not in control of the construction site or any portion of the construction site at any time. Frog Environmental does not take responsibility for the quality of water discharging from site at any time, and do not accept design liability for the efficacy of any water treatment systems that are developed as part of this report. Please refer to our full Terms & Conditions prior to procurement, as these will form part of any contract for supply of silt control products and services.

Any product specifications, technical drawings, sketches and site plans provided by Frog Environmental Ltd in relation to this report are proposals and should be reviewed and approved by the Permanent Works Designer.

Testing results are indicative and are reliant on the representative nature of samples. Most silt control systems require an element of fine tuning once installed to operate at optimal levels.

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Purpose and scope

Testing has been undertaken on a soil & water sample from the above-mentioned site. The testing process examines the rate of natural separation of solid fraction from water and helps inform the type of silt pollution control measures that may be required during Temporary Works.

Frog Environmental has a protocol in place that we will first examine the possibilities for treating water without the deployment of flocculants. Only when this avenue has been exhausted through testing and site investigation will frog suggest the use of a flocculant. For more information about the use of flocculants on construction sites, please follow the link: https://www.frogenvironmental.co.uk/pollution-avoidance-and-mitigation/flocculant-use-on-a-construction-site/

If test results show that a flocculant is required, there is a preference for working with the customer to develop gravity fed treatment systems. Gravity fed systems have several distinct advantages over pumped system:

- Reduced energy and carbon footprint
- Reduced fuel costs
- Reduced pump hire costs
- Reduced risk associated with refueling

A limitation of gravity fed treatment systems can be the effective mixing of flocculant with effluent. In these circumstances, forced mixing using a pumped flow of water can improve reaction times and settlement rates. Gravity fed systems are therefore not appropriate for every site.

Technical summary

Natural settlement at Sully Phase 2 reduced turbidity from a Start (Control) value of 709 NTU to 571 NTU over a period of 10 mins. After 2 hours NTU, turbidity further decreased to 350 NTU, with slight visible change. A 24-hour settlement provided a reduction in turbidity to 163 NTU.

Testing showed the most effective Gel Flocculant to be a combination of 494+360. The flocculant validation test comprises of three stages:

- The first stage of testing reduced turbidity from 709 NTU to 575 NTU.
- A second stage lowered turbidity further to 433 NTU.
- The third stage reduced turbidity to 216 NTU.

Contents

1. Results

Natural Settlement.

Water temperature (°C)	pH
6 °C	7.6

Control vs Settlement 2 hours

Turbidity
709 NTU to 350 NTU

Control vs Settlement 24 hours

Turbidity
709 NTU to 163 NTU

Natural settlement period	Turbidity
Control (start)	709 NTU
10 mins	571 NTU
30 mins	563 NTU
1 hour	453 NTU
2 hours	350 NTU
24 hours	163 NTU

Natural settlement at Sully Phase 2 reduced turbidity from a Start (Control) value of 709 NTU to 571 NTU over a period of 10 mins. After 2 hours NTU, turbidity further decreased to 350 NTU, with slight visible change. A 24-hour settlement provided a reduction in turbidity to 163 NTU.

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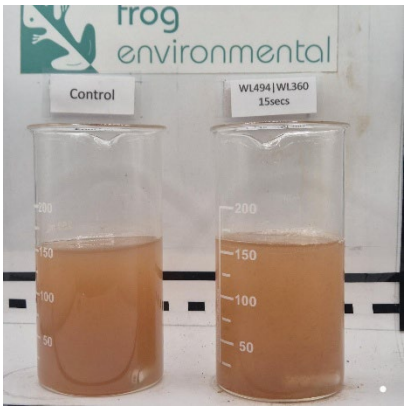
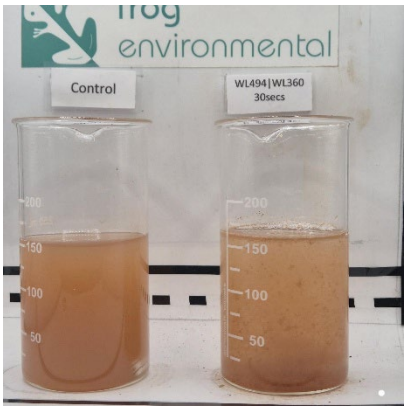
Frog Environmental Ltd.
The Stables, Blakenhall Park,
Bar Lane, Barton under Needwood,
Staffordshire, DE13 8AJ, UK

Gel Flocculant Validation



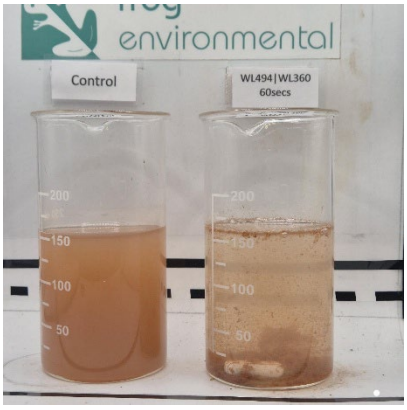
A. Test 1 Control vs Gel Flocculant 494+360 (15 seconds agitation plus 30 seconds settlement)

Turbidity
709 NTU to 575 NTU



B. Test 2 Control vs Gel Flocculant 494+360 (further 15 second agitation from Test 1 plus 60 seconds settlement)

Turbidity
575 NTU to 433 NTU



C. Test 3 Control vs Gel Flocculant 494+360 (further 15 second agitation from Test 2 plus 60 second settlement)

Turbidity
433 NTU to 216 NTU

Test 3 Close-up

Testing showed the most effective Gel Flocculant to be a combination of 494+360. The flocculant validation test comprises of three stages:

- The **first stage** of testing reduced turbidity from 709 NTU to 575 NTU.
- A **second stage** lowered turbidity further to 433 NTU.
- The **third stage** reduced turbidity to 216 NTU.

2. Conclusions and next steps

Physical settlement can produce clear water at Sully Phase 2 under laboratory conditions. However, achieving the same results on-site is unlikely unless large attenuation can be provided and external factors such as weather and flow are managed. Therefore, treatment is recommended to enhance sediment deposition and improve treatment performance, provided this is part of a structured deployment plan.

To discuss next steps, contact: natalia@frogenvironmental.co.uk.

3. Factors affecting the risk of silt pollution

Settlement Testing is a key factor when it comes to assessing the risk of a construction site causing a silt pollution event. However, there are other important factors to consider:

Factor	Why is it important?
Settlement characteristics of particle (defined by Settlement Test)	Defines how the silt particles behaves when in suspension with and without the application of Gel Flocculant
Water Attenuation areas and attenuation design	Attenuation areas slow the flow of water and allow time for silt or floc particles to settle out of suspension. If this can be done without use of flocculant, it should be.
Permitted Total Suspended Solids (TSS) value expressed in mg/l	Notes the quality of water acceptable for discharge.
The flow rate of effluent that requires treatment	Treatment solutions have differing effective treatment rates. Knowing the flow rate helps to come up with the most cost-effective approach.
Proximity and connectivity to watercourse(s)	Where does surface water from your site drain to? It is illegal to cause silt pollution or erosion at the point of discharge.
Knowledge and Experience on site	Skills and knowledge on site can help prevent a silt pollution incident or react quickly to mitigate one
Management Systems	Named roles and responsibilities on site helps a company to respond effectively to an incident.

There are 5 key components to a treatment system using Gel Flocculant:

- Mixing: the mixing of effluent with Gel Flocculant, through passive or forced measures.
- Capturing: trapping flocculated particles, either in attenuation features, Silt Capture Channels or a combination of measures.
- Maintenance: removing accreted silt from attenuation features or Silt Capture Channels
- Monitoring: testing effluent quality to ensure compliance
- Optimise: refine the system, scaling treatment up or down depending on the season or the risk associated with a specific construction phase

More information on the deployment of Gel Flocculant is available from Frog Environmental.

4. About Gel Flocculant

Gel Flocculant is an active silt control product applied in slow-release solid gel blocks. It is designed to separate liquid from solid. Gel Flocculant is stored in dehydrated state and only activates in contact with water. There are several different blends of Gel Flocculant frequently used in the UK and settlement testing establishes the most effective blend for the site in question. In some circumstances a combination of 2 different blends of Gel Flocculant may provide the most effective solid separation.

Gel Flocculant products applied in the UK are synthetic anionic polyacrylamides that also have a coagulating function.

For peer reviewed information regarding the safety of Gel Flocculant and its fate in the environment, a literature review is available from Frog Environmental upon request.

Management calculations to demonstrate the carry-over concentrations of three key substances; Acrylamide, Polyacrylamide Polyelectrolyte (PP) and Aluminium contained in Gel Flocculant are completed for every project to ensure compliance with relevant Environmental Quality Standards (EQS) for drinking water. These calculations are intentionally conservative and do not account for the factor of dilution within the receiving waterbody nor any binding to the sediments. It is anticipated that any residual concentrations are present in very small concentrations.

Should there be specific environmental sensitivities, testing for acrylamide and aluminum concentrations in effluent can be undertaken as part of a management system to ensure thresholds are not breached. However, there are no UK laboratory tests available for polyelectrolytes.

5. Test process

The aim of testing is to record the natural separation of the solid fraction from water in controlled conditions. The control is tested against different Gel Flocculant blends with reaction times and type of floc produced noted. Where a control shows promise for effective natural settlement this will be recorded in the report and the customer advised of passive silt management interventions.

Once all Gel Flocculant blends have been tested, the most effective blend is photographed and included in the report, with the results of testing from other less effective blends omitted. The control is also photographed for comparison purposes.

Repeated agitation of the same sample gives a good indication for the reaction time required to settle solids from suspension. In each case an NTU reading is taken and shown in the key alongside a photographic record of the test. The level of agitation required for reaction helps to inform a deployment plan.

In some cases, Gel Flocculant will not be effective. Whilst cationic flocculants and liquid products are available, Frog Environmental do not supply these products for use in 'open' applications, such as surface water drainage from construction sites due to the associated environmental risks.

Where products tested by Frog Environmental are not effective, this will be openly discussed with the client and support provided in objectively reviewing alternative pollution control interventions.

Clear thinking
for cleaner water

Frog Environmental

Head to our **Knowledge Hub** for guidance, videos & events

frogenvironmental.co.uk/knowledge-hub/

Or visit our website to see our **free CPD & training** courses

Frogenvironmental.co.uk/training/

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APPENDIX C
LIQUID FLOCCULANT TRIAL

Siltbuster Ltd
Williams Building, Kingswood Gate
Monmouth NP25 4EE

T: 01600 77 22 56
W: www.workdry.com/siltbuster

Andrew Przewieslik
RSK Geosciences
OP0001310

8 April 2026

Dear Andrew,

Thank you for despatching a sample from your project site at:

Swanbridge Road, Sully, Penarth,
CF64 5WD
W3W: ///honeybees.lungs.challenge

We have completed outline sample characterisation and settlement trials, the results of which are shown below.

We look forward to working closely with you and your client on this project.

Yours sincerely,

James Baylis
Business Development Manager – Infrastructure

M 07889 535 876
T 01600 77 22 56
E james.baylis@siltbuster.co.uk

OP0001310 Swanbridge Road, RSK – Summary of Analysis

James Baylis – 8 April 2026

V1.1

Received Sample Characterisation

Sample ID	Lab Ref	pH	TSS (mg/L)	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
Soil Suspension	26-092	7.75	**1,666**	4.4	<0.02

The typically accepted quality criteria for disposal of water to the environment may be:

- **<60mg/L** total suspended solids (TSS) (i.e. visually clear water)
- **pH6 to pH9**

The above analysis indicates the sample is pH near-neutral, however the suspended solids concentration is highly elevated and will require treatment before disposing to the environment.

Settling Test

The Siltbuster Laboratory conducted a gravity only settlement test to establish how quickly the suspended particles settle from suspension.

Time (mins)	Settling Velocity (m/h)	TSS (mg/L)	Clarity rating (1 = poor, 5 = tap water)	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
3	2	1,356	1		
6	1	1,330	1	4.3	<0.02
12	0.5	1,016	1		
30	0.2	832	1		
60	0.1	696	1		
120	0.05	506	1		

The above data indicates the particulate matter suspended in the received waters are very slow to settle and may predominantly comprise of clay-sized mineral particles.

A lamella clarifier designed for 1 m/hr settling velocity will remove particles or flocs capable of settling at 1 metre per hour under quiescent conditions, with the inclined plates reducing the effective settling distance to a few centimetres while maintaining laminar flow.

The data above shows that even if a gravity-only lamella clarifier designed to operate at 1m/hr was operated at 0.05m/hr (i.e. 5% of the designed flowrate) the treated water would still contain unacceptably high TSS.

Therefore, it is reasonable to conclude that gravity-only settlement will not achieve the 'visually clear' standard.

Reagent dosing testing

Coagulant and flocculant were added to the water and the settlement test was repeated.

The laboratory used an aluminium-based coagulant which is commonly used in water treatment across the UK.

The data is presented below.

Aluminium-based coagulant then anionic flocculant

Time (Mins)	Rise Rate m/hr	TSS (mg/L)	% Removal TSS	Clarity Rating (1 = poor, 5 = tap water)	pH	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
3	2	15	99.1	4			
6	1	9	99.5	4	7.04	0.180	<0.02
12	0.5	8	99.5	4			

The data above indicates introducing trace concentrations of coagulant and then anionic flocculant followed by gravity settlement will provide excellent TSS reduction and achieve a visually clear water.

Regulator's concerns over the use of chemicals are focused on potential 'carry over' of chemical that can occur if a system is overdosing. The applicable maximum limit for total Aluminium may be 1.0mg/L.

The testing demonstrates treatment reduced total Aluminium from 4.4mg/L before treatment, to less than the EQS of 1.0mg/L after treatment.

If the regulator expresses particular concern over the selection of reagents (SDS enclosed), other options may be equally effective.

Plates

As-received

3-mins settlement

6-mins settlement

30-mins settlement

SILTBUSTER
Part of The Workdry Group

 60-mins settlement	 120-mins settlement
 Treated sample – 6-mins settlement	 Treated sample – 12-mins settlement

Section 1: Identification of Substance/mixture and of the company undertaking

1.1: Product Identifier

Product Name AQUATREAT 2084

1.2: Relevant Identified use of substance/mixture and uses advised against

1.3: Details of the Supplier of the safety data sheet

Company Name: Aquatreat
Albany House
North Dock
Llanelli
Carmarthenshire
SA15 2LF

Telephone: 01554 775236
Fax: 01554 772253
E-mail: enquiries@aquatreat.co.uk
Website: www.aquatreat.co.uk

1.4: Emergency Telephone Numbers:

Emergency Telephone: 0333 333 9499

Section 2: Hazards Identification

2.1: Classification of substance/mixture according to Regulation (EC) No 1272/2008

Classification under CLP: None Not Classified

Additional Information:

2.2: Label Elements: Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Label elements under CLP: None This product has no classification or label elements under CLP

Signal Words:

Hazard Pictograms:

2.3: Other Hazards

Section 3: Composition information on hazardous ingredients

Hydrocarbons, C12 - C15, isoalkanes, cyclics <2% aromatics

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
920-107-4		H302; ASP Tox.1	20 - 45

Isotridecanol, ethoxylated

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
Polymer		H318;Eye Dam.1, H302; Acute Tox.4	<5

Section 4: First Aid Measures

4.1: Description of First Aid measures

Skin Contact: Wash off immediately with soap and plenty of water and remove all contaminated clothing and shoes. In case of persistent skin irritation, consult a physician.

Eye Contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Alternatively, rinse immediately with Diphoterine. Get prompt medical attention

Ingestion: Rinse mounth with water. DO NOT induce vomiting. Call a physician or poison control centre immediately.

Inhalation: Move to fresh air. No hazards which require special first aid measures.

4.2: Most important symptoms and effects both accute and delayed

Skin Contact: None under normal use

Eye Contact: None under normal use

Ingestion: None under normal use

Inhalation: None under normal use

4.3: Indication of any immediate medical treatment and special treatment required

None reasonably foerseeable.

Section 5: Fire fighting measures

5.1: Extinguishing media

Water. Water spray. Foam. Carbon dioxide (CO2). Dry Powder.
Warning! Spills produce extremely slippery surfaces.

Unsuitable Media

None

5.2: Special hazards arising from the substance/mixture

Oxides of Carbon and Nitrogen. Hydrogen cyanide may be produced as a result of combustion in an oxygen deficient atmosphere.

5.3: Advice for firefighters

Wear self contained breathing apparatus and protective suit.
Spills become extremely slippery when wet

Section 6: Accidental Release Measures

6.1: Personal precautions, protective equipment and emergency procedures

Do not touch or walk through spilled material. Spills produce extremely slippery surfaces.
Wear afequate personal protective equipment.
Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2: Environmental precautions

Do not allow spills to enter surface water drains and watercourses

6.3: Methods and Materials for containment and clean up

Small spills: Do not flush with water. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.
Large spills: Do not flush with water.Dam up. Soak up with inert absorbent material. Clean up promptly by scoop or vacuum.
Residues: After cleaning, flush away traces with water.

6.4: References to other sections

Section 7.0: Handling and Storage

7.1: Precautions for safe handling

Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled.
Do not eat, drink or smoke when using this product.

7.2: Conditions for safe storage.

Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material. Incompatible with oxidising agents

7.4: Specific End Use(s)

Section 8: Exposurecontrols/PersonalProtection

8.1: Control Parameters

None known

8.2: Exposure Controls

Engineering Measures	Use local exhaust ventilation if misting occurs. Natural ventilation is adequate in absence of mists.
Respiratory Protection	No personal respiratory protective equipment normally required.
Hand Protection	PVC or other plastic material gloves
Eye Protection	Safety glasses with side shields
Skin Protection	Coveralls or chemical apron and rubber footwear where physical contact can occur. Wash hands before breaks and at the end of workday. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

Section 9.0: Physical and ChemicalProperties

9.1: Information on basic physical and chemical properties

State:	Liquid
Colour:	Milky
Odour:	Aliphatic
Specific Gravity:	1.0-102
pH:	5 - 8 @5g/l

9.2: Other Information

Section 10: Stability and Reactivity

10.1: Reactivity

Stable under recommended conditions of storage and use

10.2: Chemical Stability

Stable under recommended conditions of storage and use

10.3: Possibility of Hazardous Reactions

None known

10.4: Conditions to Avoid

Heat, Sunlight and frost

10.5: Incompatible Materials

Oxidising Agents

10.6: Hazardous Decomposition Products

Thermal decomposition may produce: nitrogen oxides (NOx), carbon dioxide (COx). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combusion in an oxygen deficient atmosphere.

Section 11: Toxicological Information

Aqautreat 2084

Dermal	Rat	LD50	>5000 mg/kg (estimated)

Aquatreat 2084

Oral	Rat	LD50	>5000 mg/kg (estimated)

Section 12: Ecological Information

12.1: Toxicity

LC50/Oncorhyncus myKiss/ 96hours>100mg/l (estimated), EC50/Daphnia Magna/48 hours>100mg/l (estimated), IC50/Algae/72 hours>100mg/l(estimated)

12.2: Persistence and Biodegradable

Not readily biodegradable

12.3: Bioaccumulative Potential

This product is not expected to bioaccumulate

12.4: Mobility in Soil

No data available

12.5: Results of PBT and vPvB Assessment

Not according to the criteria of Annex XIII of REACH

12.6: Other adverse effects

None

Section 13: Disposal Information

Dispose of waste in accordance with local or national regulations

Section 14: Transport Information

UN Number	
Shipping Name	Not classified as hazardous for transport
Transport Class	
Packing Group	
Environment Hazard	
Special Precautions	
Tunnel Code	
Transport Category	

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Section 15: Regulatory Information

15.1: Safety, Health and Environmental regulations/legislation specific for the substance/mixture

All components of this product have been registered or pre-registered with the European Chemical Agency or are exempt from registration.

15.2: Chemical safety assessment

Section 16: Other information

The above information is based on our present knowledge of the product at the time of publication. It is given in good faith, no warranty is implied as to the quality or specification of the product. Information contained in this data does not constitute an assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for their purpose

Material Safety Data Sheet

Section 1: Identification of Substance/mixture and of the company undertaking

1.1: Product Identifier

Product Name PAC 10%

1.2: Relevant Identified use of substance/mixture and uses advised against

1.3: Details of the Supplier of the safety data sheet

Company Name: Aquatreat
Albany House
North Dock
Llanelli
Carmarthenshire
SA15 2LF

Telephone: 01554 775236
Fax: 01554 772253
E-mail: enquiries@aquatreat.co.uk
Website: www.aquatreat.co.uk

1.4: Emergency Telephone Numbers:

Emergency Telephone: 0333 333 9499

Section 2: Hazards Identification

2.1: Classification of substance/mixture according to Regulation (EC) No 1272/2008

Classification under CLP:	H290	Met Corr. 1
	H318	Eye Dam. 1
	H318	Eye Dam. 1

Additional Information:

2.2: Label Elements: Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Label elements under CLP:	H290	May be corrosive to metals
	H318	Causes serious eye damage
	H318	Causes serious eye damage

Signal Words: DANGER

Hazard Pictograms:

Precautionary Statements

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P361 Remove immediately all contaminated clothing.

2.3: Other Hazards

Section 3: Composition information on hazardous ingredients

Polyaluminium Chloride: REACH Registration number 01-2119531540-51

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
245-400-7	39290-78-3	H290: Met Corr.1; H318 Eye Dam.1	10

Section 4: First Aid Measures

4.1: Description of First Aid measures

Skin Contact: Remove affected person from source of exposure. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention promptly if symptoms occur after washing

Eye Contact: Remove victim immediately from source of exposure. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

Ingestion: Never make an unconscious person vomit or drink fluids. Rinse mouth thoroughly. Get medical attention immediately

Inhalation: Remove victim from source of exposure. Keep the affected person warm and at rest. Get prompt medical attention

4.2: Most important symptoms and effects both accute and delayed

Skin Contact: May cause serious chemical burns to the skin

Eye Contact: May cause serious eye damage

Ingestion: May cause burns in mucous membrane, throat, oesophagus and stomach

Inhalation: May cause burns to mucous membrane in nose, throat, lungs and bronchial system

4.3: Indication of any immediate medical treatment and special treatment required

No information available

Section 5: Fire fighting measures

5.1: Extinguishing media

Use fire extinguishing media appropriate for the surrounding materials.

Unsuitable Media

None known

5.2: Special hazards arising from the substance/mixture

May evolve corrosive gases/vapours/fumes of Hydrogen Chloride and Sulphurous gases in combustion or at high temperatures

5.3: Advice for firefighters

Wear acid resistant protective clothing and self contained breathing apparatus. Water spray should be used to cool containers

Section 6: Accidental Release Measures

6.1: Personal precautions, protective equipment and emergency procedures

Wear PPE as outlined in section 8

6.2: Environmental precautions

Avoid discharge into water courses or onto ground.

6.3: Methods and Materials for containment and clean up

Stop leak if possible without risk. Dam and absorb with sand, earth or other non combustible material. Shovel into dry containers and dispose of as special waste. Flush area with water

6.4: References to other sections

Section 7.0: Handling and Storage

7.1: Precautions for safe handling

Wear full protective clothing for prolonged exposure and or high concentrations. Eye wash facilities and emergency shower must be available when handling this producrt

7.2: Conditions for safe storage.

Use storage tank made of suitable plastic material or plastic lined steel drum.

7.4: Specific End Use(s)

Section 8: Exposurecontrols/PersonalProtection

8.1: Control Parameters

Soluble Aluminium Salts

8 Hour TWA: 2 mg/m3 **15MinSTEL:**

8.2: Exposure Controls

Engineering Measures	Provide adequate ventilation. Eye wash and emergency shower should be available.
Respiratory Protection	Respiratory protection required in case of aerosol formation
Hand Protection	PVC or rubber gloves.
Eye Protection	Goggles or face shield.
Skin Protection	Lightweight protective clothing, rubber or plastic apron

Section 9.0: Physical and ChemicalProperties

9.1: Information on basic physical and chemical properties

State:	Liquid
Colour:	Light or pale yellow
Odour:	Almost odourless
Specific Gravity:	1.2
pH:	0.5 - 1.0

9.2: Other Information

Section 10: Stability and Reactivity

10.1: Reactivity

In contact with metals generates hydrogen gas which can form explosive mixtures

10.2: Chemical Stability

Stable at ambient temperature

10.3: Possibility of Hazardous Reactions

10.4: Conditions to Avoid

Avoid excessive heat for prolonged periods of time. Avoid contact with acids

10.5: Incompatible Materials

Avoid contact with chlorites, hypochlorites and sulfites. Incompatible with other aluminium salts and iron salts.

10.6: Hazardous Decomposition Products

Hydrogen Chloride may be evolved during fire or at high temepratures

Section 11: Toxicological Information

No data available

Section 12: Ecological Information

12.1: Toxicity

12.2: Persistence and Biodegradable

Hydrolyses when diluted in water forming AL(OH)3

12.3: Bioaccumulative Potential

The product is not bioaccumulating

12.4: Mobility in Soil

No data available

12.5: Results of PBT and vPvB Assessment

No data available

12.6: Other adverse effects

Product is acidic and will reduce the pH of water courses and drains, and cause damage to fauna and flora. It should not be allowed to enter controlled waters in large quantities - in such cases the National Rivers Authority should be contacted.

Section 13: Disposal Information

Dispose of in accordance with local and national regulations

Section 14: Transport Information

UN Number	UN3264
Shipping Name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (polyaluminium chloride)
Transport Class	8
Packing Group	II
Environment Hazard	No

Special Precautions	Emergency Action Code 2X		
Tunnel Code	E	Transport Category	2

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Section 15: Regulatory Information

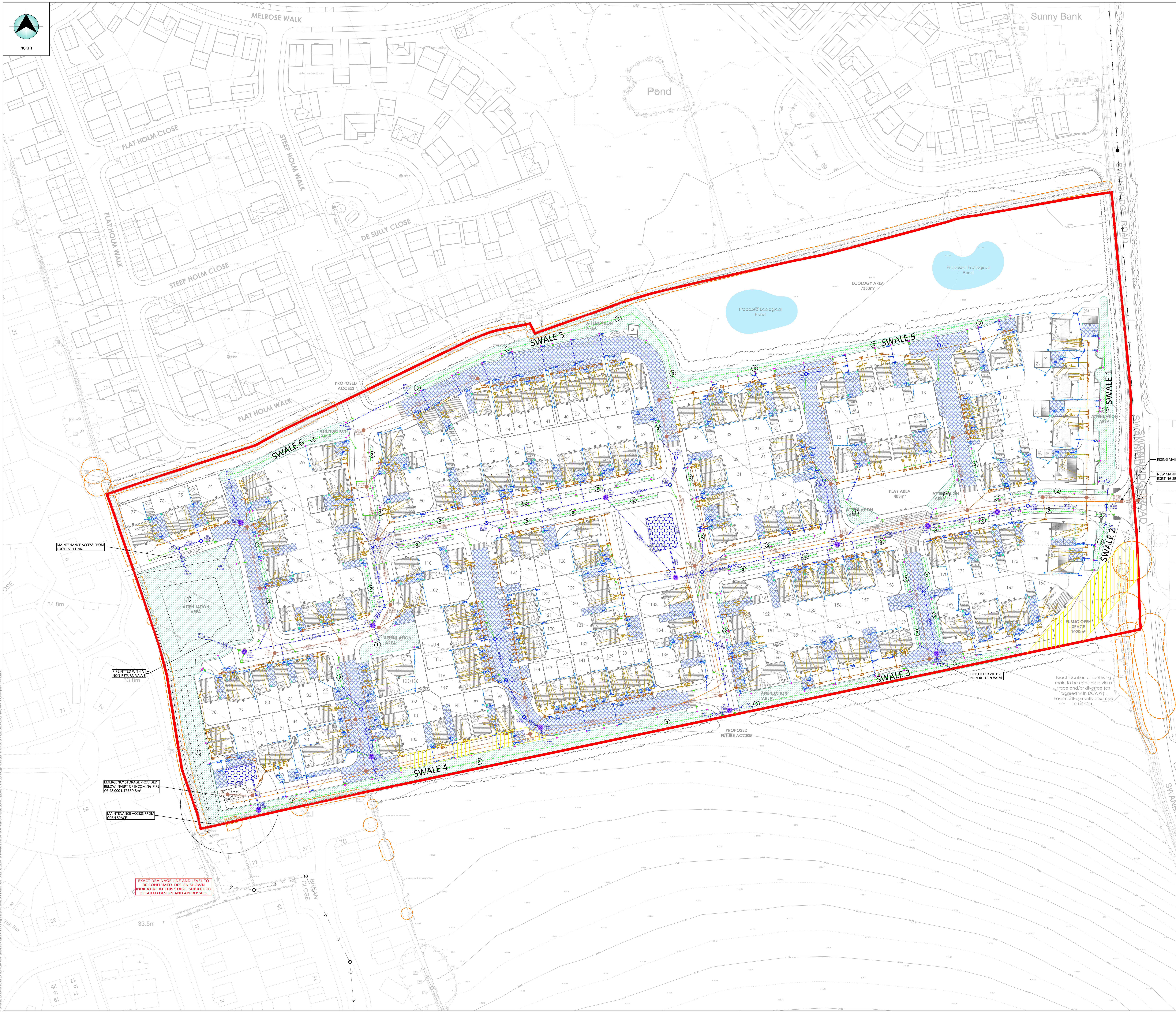
15.1: Safety, Health and Environmental regulations/legislation specific for the substance/mixture

15.2: Chemical safety assessment

Section 16: Other information

The above information is based on our present knowledge of the product at the time of publication. It is given in good faith, no warranty is implied as to the quality or specification of the product. Information contained in this data does not constitute an assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for their purpose

APPENDIX D
DESIGN DRAWINGS



LEGEND

- PROPOSED STORM WATER SEWER
- EXISTING STORM WATER SEWER
- PROPOSED FOUL WATER SEWER
- EXISTING FOUL WATER SEWER
- PROPOSED FW RISING MAIN
- (3) SUDS DETAIL REFERENCE (SEE DRG NO. D-003)
- SITE BOUNDARY
- PERMEABLE BLOCK PAVING
- DRAINAGE EASEMENT
- SURFACE WATER DRAIN & INSPECTION CHAMBER
- SURFACE WATER LATERAL DRAIN & INSPECTION CHAMBER
- ROAD GULLY
- FOUL WATER DRAIN & INSPECTION CHAMBER
- FOUL WATER LATERAL DRAIN & INSPECTION CHAMBER
- SURFACE WATER RODDING EYE
- SEL DIFFUSER UNIT (OR SIMILAR)
- SEL EROSION PAD (OR SIMILAR)
- SUDS UNDERDRAIN
- GEOGROW SMALL DIAMETER HEADWALL
- GEOGROW LARGE DIAMETER HEADWALL
- HYDROBRAKE CHAMBER (PLEASE NOTE: THERE ARE AN ADDITIONAL 5No. HYDROBRAKES NOT SHOWN, WITHIN RAIN GARDENS/SWALES/BASINS ETC)

FLOW CONTROL SCHEDULE	
HYDROBRAKE CHAMBERS	ORIFICE PLATE CHAMBERS (NOT SHOWN)
18 No.	61 No.

NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERING, ARCHITECTS & SPECIALISTS' DRAWINGS AND SPECIFICATIONS.
4. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS & SPECIFICATIONS TO THE SATISFACTION THE LOCAL AUTHORITY.
6. ANY PIPES LOCATED UNDER VEHICULAR AREAS, HAVING LESS THAN 1.2M FROM F.G.L. TO CROWN IN ROADS, 0.9M IN DOMESTIC DRIVEWAYS & 0.35M IN GARDENS SHALL HAVE CONCRETE SURROUNDS & APPROPRIATE BEDDING TO CLAUSE B3.1.10 & C3.1.10 & SFA7 CLAUSE B6.3 FOR PROTECTION. ALL OTHER PIPES WITH 1.2M OR GREATER COVER TO CROWN SHALL USE TYPE S BED & SURROUND.
7. ALL MANHOLES / INSPECTION CHAMBERS SHOULD HAVE A CONCRETE SURROUND. CONCRETE RINGS SHALL BE SEALED USING “TOKSTRIP” AND LIFTING EYES POINTED WITH RESIN MODIFIED MORTAR.
8. ALL ADOPTABLE INSPECTION CHAMBER COVERS TO BE B125 OR SIMILAR APPROVED. PLASTIC COVERS ARE NOT ACCEPTABLE FOR ADOPTION.
9. ALL PIPES SHALL HAVE THERMOPLASTIC STRUCTURED WALLS & SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 AND WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PARTY CERTIFICATION.
10. PIPES LESS THAN OR EQUAL TO 500 MM IN DIAMETER SHALL HAVE NOMINAL SHORT-TERM RING STIFFNESS NOT LESS THAN 8 KN PER M2 (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE AND EMBEDMENT.
11. NOMINAL SHORT-TERM RING STIFFNESS OF 2 KN PER M2 (SN2) IS ACCEPTABLE FOR PIPES GREATER THAN 500 MM IN DIAMETER, SUBJECT TO STRUCTURAL DESIGN LOAD CALCULATIONS IN ACCORDANCE WITH BS 9295:2019 WHICH SHALL BE PROVIDED TO SUPPORT THIS.
12. MAXIMUM LENGTH OF PIPE FOR LAYING IS 3 M OR 10 X DN, WHICHEVER IS THE GREATER.
13. CONTRACTOR TO LOCATE MANHOLE COVERS OUTSIDE OF VEHICLE TRACKS & ORIENTATED SQUARE WITH CARRIAGEWAY.
14. NO PRIVATE SURFACE WATER RUN-OFF IS TO DISCHARGE ONTO THE ADOPTED HIGHWAY.
15. ALL PRIVATE DRAINAGE SHALL BE IN ACCORDANCE WITH BS8301 & RELEVANT SECTIONS OF APPROVED DOCUMENT H OF THE BUILDING REGULATIONS.
16. PLOT DRAINAGE TO BE FLEXIBLY JOINTED 100mØ PLASTIC OR CLAY PIPES UNLESS NOTED OTHERWISE.
17. WHERE PIPES PASS THROUGH SCREEN WALLS, FOOTINGS OR RETAINING WALLS, LINTELS ARE TO BE PROVIDED.
18. ALL GULLIES & RWP'S CONNECTED DIRECTLY TO DRAINS ARE TO BE RODDABLE.
19. WHERE VERGES DIRECTLY ABUT THE DRIVEWAY, PLANTING SHOULD BE NO MORE THAN 600MM MAX HEIGHT OVER A 2M x 2M VISIBILITY SPLAY.
20. PLANTING WITHIN SuDS FEATURES TO BE SPECIFIED BY LANDSCAPE ARCHITECT.
21. CONTRACTOR TO VERIFY INVERT LEVELS AT DRAINAGE CONNECTION POINTS. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
22. THE DEVELOPER MUST COMPLY WITH NRSWA 1991, FOR TRAFFIC MANAGEMENT & FOR ANY ROAD WORKS WITHIN THE HIGHWAY.
23. ALL MANHOLES & PIPE RUNS TO BE PROTECTED AGAINST HEAVY LOADING DURING CONSTRUCTION STAGE.
24. MAIN FOUL DRAINAGE TO BE 100Ømm WHEN SERVING UP TO 10 PLOTS AND 150mm Ø THEREAFTER.
25. MAIN STORM WATER DRAINAGE TO BE 150Ømm UNLESS NOTED OTHERWISE.
26. ALL FWP, RWPS, DC & GULLIES ARE SHOWN INDICATIVELY.POSITIONS OF CONNECTION POINTS TO BE CHECKED AGAINST LATEST ARCHITECTS DRAWINGS PRIOR TO COMMENCEMENT OF WORKS.
27. POSITION AND DEPTH OF EXISTING STATUTORY UNDERTAKERS EQUIPMENT AFFECTED BY THE PROPOSED WORKS ARE TO BE CHECKED FOR ACCURACY ON SITE PRIOR TO COMMENCEMENT OF ANY OTHER WORKS.
28. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING SEWER CONNECTION AGREEMENTS, ROAD OPENING & TRAFFIC MANAGEMENT LICENSES.
29. FLOOD EXCEEDANCE PROTECTION BUNDS TO BE CONSTRUCTED 400mm ABOVE HIGHEST TOP OF SWALE BANK

(1) PROPOSED DETENTION BASIN TO PROVIDE ON SITE SURFACE WATER STORAGE & AMENITY.

(2) PROPOSED HIGHWAY RAIN GARDEN TO PROVIDE HIGHWAY SURFACE WATER TREATMENT.

(3) PROPOSED SWALE TO PROVIDE ON SITE SURFACE WATER STORAGE & AMENITY.

Rev	Details	Drawn	Checked	Date
K	HYDROBRAKE CHAMBERS AND FLOW CONTROL SCHEDULE ADDED	SJ	LF	02.03.26
J	ISSUED FOR TENDER	SJ	LF	27.02.26
i	UPDATED DRAINAGE AS PER LLFA	LF	LF	19.01.26
G	MAINTENANCE LOCATION ADDED	LF	LF	05.11.25
F	SURFACE WATER UPDATED	ACT	LF	06.08.25
E	EXISTING FOUL RISING MAIN EASEMENT ADDED SHOWING NO SUDS FEATURES WITHIN ITS EXTENTS	SJ	LF	08.07.25
D	NEW LAYOUT ADDED	ACT	LF	09.04.25
C	NEW LAYOUT ADDED AND DRAINAGE UPDATED TO SUIT	ACT	LF	22.01.25

thinkurban Architecture & Civil Engineering
Quest House
St Mellons Business Park
Fortran Road
Cardiff
CF3 0EY
T: 02922 520 219

Client: Taylor Wimpey Cardiff

Project: Cog Road, Sully Phase 2

Drawing: Surface Water Drainage Strategy

Scale	Sheet Size
NTS	A0

Drawn	Checked	Date
SJ	LF	01/07/2024

Drawing Number	Revision
181102_TWC_D_002	K

...ineering\1- Drawings\D - Drainage\ 181102-PH2-TWC-D-002 K Drainage Strategy.dwg

APPENDIX E
INSPECTION CHECKLIST EXAMPLES

GULLEY INSPECTION CHECKLIST
SITE:

Date	Gully no	Fit for purpose (yes/no)	(if no: action required, clean / replace?)	Comment	Signature

SITE INSPECTION CHECKLIST
SITE:

Name of person undertaking inspection: .....
Date: .....
Current weather conditions: .....

Description	Comments	Action	Initial
1) What is the current condition of the gully protection measures within the completed / un-adopted areas of the site? *Note any gullies requiring maintenance measures*			
2) What is the current condition of the gully protection measures within the active areas of the site? *Note any gullies requiring maintenance measures*			
3) Are site roads clean and relatively free of mud? Is the frequency of visits by the road sweeper adequate? *Consider whether additional visits should be scheduled.*			
4) Are there currently unsurfaced areas being trafficked which may be causing silt to enter the site drainage or stream? *Note if additional measures are required to reduce the run-off from these unsurfaced areas.*			

5) Are control measures in place to prevent silt run-off from unsurfaced areas and soil stockpiles? *Note if the control measures are adequate and whether the increased runoff requires an increase in the frequency of inspection of any control measures.*			
6) What is the current water condition of the water bodies / watercourses (including attenuation basins / swales)? *Note any discolouration of the water or obvious sign of sediment within the water.*			
7) Is there any dewatering of excavations taking place on site? *Note what activities are taking part and their location.* *Note any control measures in place.*			
Notes and actions to be taken:			

Completed by	Name	Signature	Date
Site Manager			

APPENDIX C – TAYLOR WIMPEY ENVIRONMENTAL MANAGEMENT SYSTEMS

HEALTH, SAFETY AND ENVIRONMENTAL (HSE) POLICY

General Policy Statement

This HSE policy for Taylor Wimpey plc applies to all Taylor Wimpey UK companies, sites and businesses; Spain; and any other of its businesses and operations (collectively "Taylor Wimpey"). Taylor Wimpey plc regards HSE management as a non-negotiable number one priority for our business. We want all our employees and sub- contractors to leave each of our sites safe and well every day. Taylor Wimpey plc fully recognises the importance of maintaining good standards of HSE management and the impact this has on the effectiveness and sustainability of its business. In order to demonstrate our understanding and commitment, HSE Management Systems have been developed and are fully communicated throughout our organisation at all levels applying risk management and pollution prevention principles to our activities, products and services.

It is the policy of the Board of Taylor Wimpey plc ("Board") to ensure all activities meet or exceed all applicable HSE legislation, regulations and any other requirements to which we subscribe. In doing so all employees, contractors' employees, self-employed persons and the general public will be assured acceptable standards of HSE management.

The Board views HSE management as the top priority within the company and promotes HSE best practice being accepted as a core value in all businesses.

This Policy reflects the commitment of the Board and those accountable to the Board for its implementation. This Policy therefore outlines Taylor Wimpey's ongoing commitment to continuous improvement of our HSE performance. All businesses are required to conduct their business in a manner that, as far as is practicable, will minimise adverse effects upon the environment.

Taylor Wimpey will ensure the HSE policy is communicated, understood and implemented effectively at all levels throughout the business, including those persons working for or on behalf of the Taylor Wimpey and is formalised within the HSE management systems.

Organisation

- All levels of management across the Taylor Wimpey business are to be held responsible and accountable for operating a safe workplace that seeks to create a minimum burden upon the environment.

All employees are expected to strive to achieve and maintain the highest standards of HSE management and to comply fully with our HSE Management Systems.

Arrangements

- HSE considerations are agenda points at every meeting of the Group Management Team. A review of performance is carried out and measurable targets for HSE performance improvement are set and reviewed.

- Taylor Wimpey will maintain a review process that incorporates HSE performance targets, progress measurement, continual improvement and communication with relevant interested parties.

- The Board recognises that it can only achieve significant lasting improvement in HSE performance of its businesses if it has the co-operation and support of its contractors. Taylor Wimpey intends to continually encourage and promote the provision of suitable health, safety and environmental training to its contractors' employees and self-employed.

- Homes and Communities Agency, local planning authorities, NHBC, local and national government sustainability criteria, private and public landowners and other interested parties will be consulted over time to ensure our policies meet other non-statutory requirements and to ensure best practice.

- This policy and commitment of the organisation is only achievable by ensuring resources, be they human, technical or financial, are provided to those actively engaged in any of Taylor Wimpey's business activities. The Board is committed to provide those resources.

- The Board will regularly monitor and keep under review the effectiveness of this Policy.

Jennie Daly
Chief Executive
Taylor Wimpey plc
Date: 01.01.2026

Environment Policy

The Board of Taylor Wimpey plc will monitor the effectiveness of this Policy and will review the Policy on a regular basis and at least every two years.			
Approved by:	Board of Taylor Wimpey plc	Last Reviewed:	3 March 2026

Environment Policy

Taking action on the environment is essential to create great places to live for our customers, to reduce risks and costs to our business and to help protect the wellbeing of communities today and in the future. We are committed to continually reducing our footprint, building sustainable communities and creating a positive environmental legacy.

Our commitment covers all stages of development from land buying through to construction, and encompasses our operations, supply chain and customer homes and developments. We have a particular focus on three areas:

- Climate change
- Nature
- Resources and waste (including water use)

We aim to align with the UN Sustainable Development Goals and in particular to contribute to delivering UN Sustainable Development Goal 11: 'making cities and human settlements inclusive, safe, resilient and sustainable'. We are committed to reducing our environmental impacts and aim to work towards environmental net gain.

It is our policy to:

- Comply with all relevant environmental regulations and planning requirements
- Understand our environmental impacts and conduct regular materiality assessments
- Set quantitative targets through our environmental strategy to continually improve performance across our value chain
- Put systems in place to identify and manage environmental risks and opportunities and embed these into our wider risk identification and mitigation processes
- Implement our Health, Safety and Environmental Management System (EMS)
- Engage with suppliers, peers, environmental experts and others to reduce the environmental footprint of our business and the wider housebuilding sector
- Make it easier for customers to live a more sustainable lifestyle through the design and construction of our homes and developments and through our communications
- Ensure all business units comply with our Environment Policy
- Allocate resources and provide training to enable colleagues and site operatives to implement this policy
- Establish clear governance and review processes for environmental performance at business unit and Group level
- Publicly report performance against our environmental targets at least annually.

This policy should be read in conjunction with our Health, Safety and Environment Policy, Sustainability Policy and Supply Chain Policy.

Detailed policy commitments for Climate Change and Energy Use, Biodiversity and Nature, Sustainable Timber, Waste and Resources, and Water are provided in the following pages and collectively form our Environment Policy.

Climate Change and Energy Use

We will play our part in keeping global temperature rises to 1.5°C by reducing emissions across our value chain in line with climate science.

We have a significant carbon footprint through our operations, through the goods and services we buy and the energy used in our homes once customers move in. We also have an opportunity to help customers live a lower carbon lifestyle through the way we design our homes and developments.

We seek to align our approach with the Paris Climate Change Agreement and the UN Sustainable Development Goals 13 - Climate Action and 7 - Affordable and Clean Energy.

It is our policy to:

- Implement our net zero transition plan to reach net zero emissions by 2045
- Achieve our carbon reduction targets which have been verified by the Science Based Targets initiative and publicly report performance at least annually
- Purchase REGO backed green electricity for all new sites and transition existing contracts to REGO backed contracts
- Deliver energy efficient homes for customers and design our sites to enable sustainable transport and lower carbon lifestyles
- Engage with suppliers to achieve our scope 3 carbon targets, including selecting materials with lower embodied carbon and selecting energy efficient products
- Monitor and disclose our greenhouse gas emissions at least annually, in line with the Greenhouse Gas Protocol
- Identify and manage climate change adaptation and mitigation risks and opportunities for our operations, supply chain and customer homes, including conducting climate change due diligence on our sites prior to acquisition
- Engage with regulators, local planning authorities, peers, suppliers and others in the UK to speed up the decarbonisation of the housebuilding sector.

Taylor Wimpey Spain mainly buys serviced plots so does not control climate change and energy impacts relating to the development and infrastructure beyond the homes.

Biodiversity and Nature

Species, ecosystems and biodiversity are under threat across the world, due to changes in land use, pollution and climate change.

We recognise that our business depends on nature and the ecosystems services provided by the natural world. We aim to avoid and minimise the negative impacts of housing development on nature, and to use our sites to protect, enhance and increase biodiversity. This will also benefit the health and

wellbeing of our customers and communities.

We seek to align our approach with the UN Sustainable Development Goal 15, Life on Land.

It is our policy to:

- Identify and mitigate biodiversity impacts at all stages of development
- Comply with all relevant laws and planning requirements in relation to nature and biodiversity
- Conduct an ecological impact assessment for all sites and consult with ecologists to identify measures needed in relation to protected species and habitats. This includes where sites contain or are adjacent to protected areas (e.g. World Heritage sites or Sites of Special Scientific Interest). Measures must be integrated into the Site Specific Environmental Action Plan, part of our environmental management system
- Work with expert nature organisations and ecologists to develop and implement our biodiversity targets.
- Work with suppliers to address biodiversity impacts for our developments and in our supply chain
- Create opportunities for customers and communities to engage with nature on our sites
- Carry out risk assessments and additional due diligence for developments in areas of nutrient stress and work closely with the local authority to develop a proactive plan to address and mitigate the potential impacts of development.

This policy applies to our operations in the UK. Taylor Wimpey Spain mainly buys serviced plots and cannot control land outside the boundary of the homes. Taylor Wimpey Spain complies with all relevant laws and planning requirements in relation to nature and biodiversity.

Sustainable Timber

Forests are a vital natural habitat and home to 80% of the world's terrestrial biodiversity. They help to mitigate climate change, clean the air, prevent soil erosion and are a source of livelihoods for many millions of people. However, deforestation and illegal logging are affecting forests across the world.

We use significant amounts of timber to build and fit out our homes and operate our own timber frame factory. We are committed to responsible timber sourcing and to achieving a deforestation-free timber supply chain. As a landowner, we also have an opportunity to support efforts to increase tree planting by integrating trees into our development sites.

We aim to align our approach with the UN Sustainable Development Goal 15, Life on Land.

It is our policy to:

- Use timber and timber products from legally logged sources, in compliance with relevant regulations including the UK Timber Regulations and the EU Timber Regulations in Spain
- Not to use species included on the IUCN Red List of Threatened Species as vulnerable or endangered
- Require suppliers to supply timber and timber products from well managed forests with full chain

of custody certification from either the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC)

- Through our use of certified timber support the way of life, rights and livelihoods of indigenous communities that live and work in forests
- Reuse or recycle waste timber wherever possible during the manufacturing and construction process
- Integrate trees into our development sites, retaining existing mature trees wherever feasible
- Engage suppliers on our timber policy to aim to achieve a deforestation-free timber supply chain
- In the UK we require suppliers to disclose the timber species used, country of origin and volume for all timber and timber products supplied

Waste and Resources

Over consumption of resources and disposal of waste contributes to climate change, pollution and other environmental problems.

At Taylor Wimpey we use significant volumes of materials and natural resources to build our homes.

We aim to select sustainable materials, use resources efficiently, avoid and reduce waste, and increase reuse and recycling. This makes good business sense, reduces our environmental footprint and can help to improve resilience to future resource shortages and price rises.

We look for opportunities to adopt circular approaches to resource use and to work with others in our sector to bring about wider change. Our long-term goal is to achieve net zero avoidable waste from the construction of our homes.

We align our approach with UN Sustainable Development Goal 12 Responsible Production and Consumption.

It is our policy to:

- Apply the waste hierarchy to waste management in our operations, including avoiding waste through design, reusing and recycling as much as possible, and only disposing of waste to landfill as a last resort
- Set group waste reduction targets and report performance annually
- Ensure that all waste is handled and disposed of in an environmentally acceptable manner, in compliance with regulation
- Communicate our standards to suppliers and work with them to reduce waste, improve resource efficiency, increase recycling on our sites and increase our use of recycled, renewable and more sustainable materials
- Integrate resource efficiency into the design of our homes and developments
- Avoid and minimise any pollution from our development sites including in relation to remediated land, silt run-offs, spillages, dust and air quality.

- Develop a Site Waste Management Plan for all our construction sites.

In addition, in the UK it is our policy to:

- Maximise the reuse and recycling of soil and demolition waste from our sites, aiming to achieve zero mass balance for earthworks

- Ensure that any previously derelict or contaminated land is fully remediated so that it is safe and suitable for housing development

Taylor Wimpey Spain mainly buys serviced plots so does not control waste impacts relating to demolition and remediation, or excavation beyond the plot boundary.

Water

Human and environmental factors are putting pressure on global water resources. These include:

- Flooding due to the increase in intensity and frequency of storms, peak river levels and sea level rise caused by climate change;

- Increased demand for water supply due to population growth and urbanisation;

- Water scarcity and drought resulting from climate change and growing demand; and

- Damage to ecosystems from water over-abstraction and water pollution.

Our business is dependent upon water for the health and wellbeing of our employees, contractors and customers, and water is essential for the construction and use of our homes and developments. We recognise our business has both positive and negative impacts on the water environment. We strive to use water responsibly and to play our part in managing flood risk, reducing water use, minimising ecosystem impacts of abstraction, and protecting water quality for the benefit of our customers, communities, business and the environment.

We acknowledge the human right to water and sanitation and aim to support the UN Sustainable Development Goal 6 on clean water and sanitation.

It is our policy to:

- Help our customers reduce water consumption through measures such as low flow taps and showers, dual flush toilets, water meters in our homes; and to explore other ways to reduce home water consumption, and providing them with the information that they need.

- Work with suppliers to improve water efficiency and water quality in the supply chain.

- Use our environmental management systems and HSE processes to protect groundwater and surface water environments during construction.

- Set group targets for water use reduction from our operations and report performance annually.

Where we buy land in the UK, we are committed to:

- Assessing potential flood risk on proposed developments, (including from rivers, coast lines, groundwater, surface water and damaged drainage infrastructure) and ensuring that our developments are built to appropriate standards of flood resistance in line with the expected

impacts of climate change

- Working with local stakeholders to plan for water use in the areas we operate that experience water scarcity or drought.
- Working with local authorities to address challenges relating to water neutrality where needed
- Using surface water features to support placemaking, biodiversity and sustainable drainage, where this is appropriate.

Taylor Wimpey Spain mainly buys serviced plots. It complies with all laws in relation to flood risk and water management.

APPENDIX D – GEL AND LIQUID FLOCCULANT SETTLEMENT TEST REPORTS

Clear thinking
for cleaner water

Frog Environmental

Settlement test and flocculant validation report

RSK Geosciences
Sully Phase 2
FC7745
30 March 2026

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info@frogenvironmental.co.uk
frogenvironmental.co.uk

Company number: 973815

Project disclaimer

The use of flocculants on site requires permission from the local regulatory authority. Proceeding with deployment of Gel Flocculant without regulatory permission is not advised.

Whilst Frog Environmental provide advice on product specification and deployment, we are not in control of the construction site or any portion of the construction site at any time. Frog Environmental does not take responsibility for the quality of water discharging from site at any time, and do not accept design liability for the efficacy of any water treatment systems that are developed as part of this report. Please refer to our full Terms & Conditions prior to procurement, as these will form part of any contract for supply of silt control products and services.

Any product specifications, technical drawings, sketches and site plans provided by Frog Environmental Ltd in relation to this report are proposals and should be reviewed and approved by the Permanent Works Designer.

Testing results are indicative and are reliant on the representative nature of samples. Most silt control systems require an element of fine tuning once installed to operate at optimal levels.

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info@frogenvironmental.co.uk
frogenvironmental.co.uk

Frog Environmental Ltd.
The Stables, Blakenhall Park,
Bar Lane, Barton under Needwood,
Staffordshire, DE13 8AJ, UK

Purpose and scope

Testing has been undertaken on a soil & water sample from the above-mentioned site. The testing process examines the rate of natural separation of solid fraction from water and helps inform the type of silt pollution control measures that may be required during Temporary Works.

Frog Environmental has a protocol in place that we will first examine the possibilities for treating water without the deployment of flocculants. Only when this avenue has been exhausted through testing and site investigation will frog suggest the use of a flocculant. For more information about the use of flocculants on construction sites, please follow the link: https://www.frogenvironmental.co.uk/pollution-avoidance-and-mitigation/flocculant-use-on-a-construction-site/

If test results show that a flocculant is required, there is a preference for working with the customer to develop gravity fed treatment systems. Gravity fed systems have several distinct advantages over pumped system:

- Reduced energy and carbon footprint
- Reduced fuel costs
- Reduced pump hire costs
- Reduced risk associated with refueling

A limitation of gravity fed treatment systems can be the effective mixing of flocculant with effluent. In these circumstances, forced mixing using a pumped flow of water can improve reaction times and settlement rates. Gravity fed systems are therefore not appropriate for every site.

Technical summary

Natural settlement at Sully Phase 2 reduced turbidity from a Start (Control) value of 709 NTU to 571 NTU over a period of 10 mins. After 2 hours NTU, turbidity further decreased to 350 NTU, with slight visible change. A 24-hour settlement provided a reduction in turbidity to 163 NTU.

Testing showed the most effective Gel Flocculant to be a combination of 494+360. The flocculant validation test comprises of three stages:

- The first stage of testing reduced turbidity from 709 NTU to 575 NTU.
- A second stage lowered turbidity further to 433 NTU.
- The third stage reduced turbidity to 216 NTU.

Contents

1. Results

Natural Settlement.

Water temperature (°C)	pH
6 °C	7.6

Control vs Settlement 2 hours

Turbidity
709 NTU to 350 NTU

Control vs Settlement 24 hours

Turbidity
709 NTU to 163 NTU

Natural settlement period	Turbidity
Control (start)	709 NTU
10 mins	571 NTU
30 mins	563 NTU
1 hour	453 NTU
2 hours	350 NTU
24 hours	163 NTU

Natural settlement at Sully Phase 2 reduced turbidity from a Start (Control) value of 709 NTU to 571 NTU over a period of 10 mins. After 2 hours NTU, turbidity further decreased to 350 NTU, with slight visible change. A 24-hour settlement provided a reduction in turbidity to 163 NTU.

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Frog Environmental Ltd.
The Stables, Blakenhall Park,
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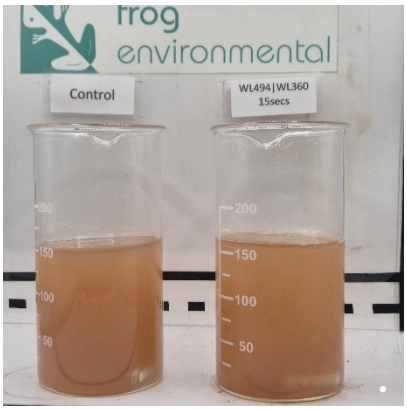
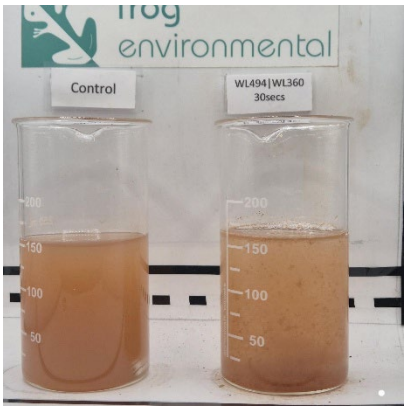
Gel Flocculant Validation



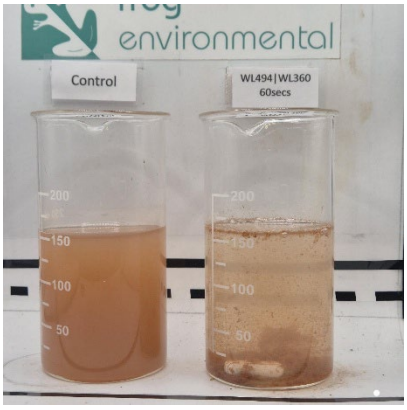
A. Test 1 Control vs Gel Flocculant 494+360 (15 seconds agitation plus 30 seconds settlement)

Turbidity
709 NTU to 575 NTU



B. Test 2 Control vs Gel Flocculant 494+360 (further 15 second agitation from Test 1 plus 60 seconds settlement)

Turbidity
575 NTU to 433 NTU



C. Test 3 Control vs Gel Flocculant 494+360 (further 15 second agitation from Test 2 plus 60 second settlement)

Turbidity
433 NTU to 216 NTU

Test 3 Close-up

Testing showed the most effective Gel Flocculant to be a combination of 494+360. The flocculant validation test comprises of three stages:

- The **first stage** of testing reduced turbidity from 709 NTU to 575 NTU.
- A **second stage** lowered turbidity further to 433 NTU.
- The **third stage** reduced turbidity to 216 NTU.

2. Conclusions and next steps

Physical settlement can produce clear water at Sully Phase 2 under laboratory conditions. However, achieving the same results on-site is unlikely unless large attenuation can be provided and external factors such as weather and flow are managed. Therefore, treatment is recommended to enhance sediment deposition and improve treatment performance, provided this is part of a structured deployment plan.

To discuss next steps, contact: natalia@frogenvironmental.co.uk.

3. Factors affecting the risk of silt pollution

Settlement Testing is a key factor when it comes to assessing the risk of a construction site causing a silt pollution event. However, there are other important factors to consider:

Factor	Why is it important?
Settlement characteristics of particle (defined by Settlement Test)	Defines how the silt particles behaves when in suspension with and without the application of Gel Flocculant
Water Attenuation areas and attenuation design	Attenuation areas slow the flow of water and allow time for silt or floc particles to settle out of suspension. If this can be done without use of flocculant, it should be.
Permitted Total Suspended Solids (TSS) value expressed in mg/l	Notes the quality of water acceptable for discharge.
The flow rate of effluent that requires treatment	Treatment solutions have differing effective treatment rates. Knowing the flow rate helps to come up with the most cost-effective approach.
Proximity and connectivity to watercourse(s)	Where does surface water from your site drain to? It is illegal to cause silt pollution or erosion at the point of discharge.
Knowledge and Experience on site	Skills and knowledge on site can help prevent a silt pollution incident or react quickly to mitigate one
Management Systems	Named roles and responsibilities on site helps a company to respond effectively to an incident.

There are 5 key components to a treatment system using Gel Flocculant:

- Mixing: the mixing of effluent with Gel Flocculant, through passive or forced measures.
- Capturing: trapping flocculated particles, either in attenuation features, Silt Capture Channels or a combination of measures.
- Maintenance: removing accreted silt from attenuation features or Silt Capture Channels
- Monitoring: testing effluent quality to ensure compliance
- Optimise: refine the system, scaling treatment up or down depending on the season or the risk associated with a specific construction phase

More information on the deployment of Gel Flocculant is available from Frog Environmental.

4. About Gel Flocculant

Gel Flocculant is an active silt control product applied in slow-release solid gel blocks. It is designed to separate liquid from solid. Gel Flocculant is stored in dehydrated state and only activates in contact with water. There are several different blends of Gel Flocculant frequently used in the UK and settlement testing establishes the most effective blend for the site in question. In some circumstances a combination of 2 different blends of Gel Flocculant may provide the most effective solid separation.

Gel Flocculant products applied in the UK are synthetic anionic polyacrylamides that also have a coagulating function.

For peer reviewed information regarding the safety of Gel Flocculant and its fate in the environment, a literature review is available from Frog Environmental upon request.

Management calculations to demonstrate the carry-over concentrations of three key substances; Acrylamide, Polyacrylamide Polyelectrolyte (PP) and Aluminium contained in Gel Flocculant are completed for every project to ensure compliance with relevant Environmental Quality Standards (EQS) for drinking water. These calculations are intentionally conservative and do not account for the factor of dilution within the receiving waterbody nor any binding to the sediments. It is anticipated that any residual concentrations are present in very small concentrations.

Should there be specific environmental sensitivities, testing for acrylamide and aluminum concentrations in effluent can be undertaken as part of a management system to ensure thresholds are not breached. However, there are no UK laboratory tests available for polyelectrolytes.

5. Test process

The aim of testing is to record the natural separation of the solid fraction from water in controlled conditions. The control is tested against different Gel Flocculant blends with reaction times and type of floc produced noted. Where a control shows promise for effective natural settlement this will be recorded in the report and the customer advised of passive silt management interventions.

Once all Gel Flocculant blends have been tested, the most effective blend is photographed and included in the report, with the results of testing from other less effective blends omitted. The control is also photographed for comparison purposes.

Repeated agitation of the same sample gives a good indication for the reaction time required to settle solids from suspension. In each case an NTU reading is taken and shown in the key alongside a photographic record of the test. The level of agitation required for reaction helps to inform a deployment plan.

In some cases, Gel Flocculant will not be effective. Whilst cationic flocculants and liquid products are available, Frog Environmental do not supply these products for use in 'open' applications, such as surface water drainage from construction sites due to the associated environmental risks.

Where products tested by Frog Environmental are not effective, this will be openly discussed with the client and support provided in objectively reviewing alternative pollution control interventions.

Clear thinking
for cleaner water

Frog Environmental

Head to our **Knowledge Hub** for guidance, videos & events

frogenvironmental.co.uk/knowledge-hub/

Or visit our website to see our **free CPD & training** courses

Frogenvironmental.co.uk/training/

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Frog Environmental Ltd.
The Stables, Blakenhall Park,
Bar Lane, Barton under Needwood,
Staffordshire, DE13 8AJ, UK

Siltbuster Ltd
Williams Building, Kingswood Gate
Monmouth NP25 4EE

T: 01600 77 22 56
W: www.workdry.com/siltbuster

Andrew Przewieslik
RSK Geosciences
OP0001310

8 April 2026

Dear Andrew,

Thank you for despatching a sample from your project site at:

Swanbridge Road, Sully, Penarth,
CF64 5WD
W3W: ///honeybees.lungs.challenge

We have completed outline sample characterisation and settlement trials, the results of which are shown below.

We look forward to working closely with you and your client on this project.

Yours sincerely,

James Baylis
Business Development Manager – Infrastructure

M 07889 535 876
T 01600 77 22 56
E james.baylis@siltbuster.co.uk

OP0001310 Swanbridge Road, RSK – Summary of Analysis

James Baylis – 8 April 2026

V1.1

Received Sample Characterisation

Sample ID	Lab Ref	pH	TSS (mg/L)	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
Soil Suspension	26-092	7.75	**1,666**	4.4	<0.02

The typically accepted quality criteria for disposal of water to the environment may be:

- **<60mg/L** total suspended solids (TSS) (i.e. visually clear water)
- **pH6 to pH9**

The above analysis indicates the sample is pH near-neutral, however the suspended solids concentration is highly elevated and will require treatment before disposing to the environment.

Settling Test

The Siltbuster Laboratory conducted a gravity only settlement test to establish how quickly the suspended particles settle from suspension.

Time (mins)	Settling Velocity (m/h)	TSS (mg/L)	Clarity rating (1 = poor, 5 = tap water)	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
3	2	1,356	1		
6	1	1,330	1	4.3	<0.02
12	0.5	1,016	1		
30	0.2	832	1		
60	0.1	696	1		
120	0.05	506	1		

The above data indicates the particulate matter suspended in the received waters are very slow to settle and may predominantly comprise of clay-sized mineral particles.

A lamella clarifier designed for 1 m/hr settling velocity will remove particles or flocs capable of settling at 1 metre per hour under quiescent conditions, with the inclined plates reducing the effective settling distance to a few centimetres while maintaining laminar flow.

The data above shows that even if a gravity-only lamella clarifier designed to operate at 1m/hr was operated at 0.05m/hr (i.e. 5% of the designed flowrate) the treated water would still contain unacceptably high TSS.

Therefore, it is reasonable to conclude that gravity-only settlement will not achieve the 'visually clear' standard.

Reagent dosing testing

Coagulant and flocculant were added to the water and the settlement test was repeated.

The laboratory used an aluminium-based coagulant which is commonly used in water treatment across the UK.

The data is presented below.

Aluminium-based coagulant then anionic flocculant

Time (Mins)	Rise Rate m/hr	TSS (mg/L)	% Removal TSS	Clarity Rating (1 = poor, 5 = tap water)	pH	Total Aluminium (mg/L)	Dissolved Aluminium (mg/L)
3	2	15	99.1	4			
6	1	9	99.5	4	7.04	0.180	<0.02
12	0.5	8	99.5	4			

The data above indicates introducing trace concentrations of coagulant and then anionic flocculant followed by gravity settlement will provide excellent TSS reduction and achieve a visually clear water.

Regulator's concerns over the use of chemicals are focused on potential 'carry over' of chemical that can occur if a system is overdosing. The applicable maximum limit for total Aluminium may be 1.0mg/L.

The testing demonstrates treatment reduced total Aluminium from 4.4mg/L before treatment, to less than the EQS of 1.0mg/L after treatment.

If the regulator expresses particular concern over the selection of reagents (SDS enclosed), other options may be equally effective.

Plates

As-received

3-mins settlement

6-mins settlement

30-mins settlement

SILTBUSTER
Part of The Workdry Group

 60-mins settlement	 120-mins settlement
 Treated sample – 6-mins settlement	 Treated sample – 12-mins settlement

APPENDIX E – GEL AND LIQUID FLOCCULANT MATERIAL SAFETY DATA SHEETS

SAFETY DATA SHEET

Gel Flocculant 360

SECTION 1: IDENTIFICATION OF MIXTURE AND COMPANY

1.1 Product identifier

Gel Flocculant 360

CHEMICAL FAMILY: Polyacrylamide/polyacrylate polymer

CAS NUMBER: none identified

CHEMICAL NAME: none identified

1.2 Relevant Identified Uses

Water treatment

1.3 Supplier

Frog Environmental Ltd

Business Contact

The Byre

0345 057 4040

Blackenhall Park

Emergency Contact

Bar Lane

Staffordshire DE13 8AJ

0345 057 4040 (not 24 hours)

24 Hour Emergency Contact

UK National Poisons Information Service: 0344 892 0111

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification

Not classified according to EU regulation 1272/2008 as implemented in The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019.

2.2 Label elements

No labeling required

2.3. Other hazards

No component meets the criteria of a PBT or vPvB substance according to EU regulation 1907/2006 as implemented in The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019 (as amended)

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

There are no components present, within the current knowledge of the supplier that are classified as hazardous to health or the environment and present at concentrations that require reporting in this section.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid.

Skin

Wash skin with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If irritation occurs get medical attention.

Inhalation

Remove exposed person to fresh air. Seek medical attention if the patient feels unwell.

Eye

Flush eyes with large amounts of water for at least 15 minutes, lifting eyelids to insure complete flushing of surface. Seek medical attention if irritation persists.

Ingestion

Keep at rest. Never give anything by mouth to an unconscious person. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Keep airway clear. Seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed.

Signs and Symptoms of Acute Exposure

Inhalation: vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.

Ingestion: May cause irritation of the lining of the stomach.

Skin: Mild to moderate irritation can occur.

Eyes: Can cause mild to moderate irritation.

Chronic Health Effects

Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness. No known other chronic effects.

4.3 Indication of any immediate medical attention and special treatment needed.

Treat symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

5.1. Extinguishing Media

Suitable: Use extinguishing media suitable for the surrounding fire.

Unsuitable: None.

5.2. Special hazards arising from the mixture

Hazardous Combustion Products: Carbon and Nitrogen Oxides (CO, CO2, NOx)

5.3. Advice for Firefighters

Protective Equipment/Clothing: Wear full protective clothing including positive pressure self-contained breathing apparatus.

Fire Fighting Guidance: Fight large fires from maximum distance or use unmanned hose handlers or monitor nozzles. Move containers from fire area if you can do it without risk. Cool containers with flooding quantities of water until after fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear appropriate protective equipment (see section 8). Wet product and aqueous solutions of product are very slippery. Trace amounts of product on smooth surfaces can become extremely slippery when wet.

6.2 Environmental precautions

Prevent entry of concentrated solutions into waterways or sewers.

6.3. Methods and materials for containment and clear up

Sweep or scoop dry material and place in appropriate container. Absorb aqueous solutions with a dry inert material, such as clay, and place in an appropriate waste disposal container. After most of the material has been recovered, clean the area with warm, soapy water.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Normal precautions common to good manufacturing practice should be followed in handling and storage. Open and handle container with care. Keep the containers closed when not in use. Avoid physical damage to blocks. Use appropriate personnel protective equipment (See section 8).. Avoid contact with eyes, skin, and clothing. Do not ingest. After handling, wash hands thoroughly with soap and water.

7.2. Conditions for safe storage, including any incompatibilities.

Store in a cool, dry area. Store in accordance with good industrial practices. Keep away from direct sunlight. Protect against physical damage.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1. Control parameters

None identified.

8.2. Exposure controls

8.2.1. Engineering Controls

No specific measures required.

8.2.2. Individual Personal Protection

Eye Safety glasses are required as a minimum. Use splash goggles or a face shield when eye contact due to splashing is possible.

Skin: Wear nitrile, butyl or Viton® gloves. The specification of glove depends on the work being undertaken; consult manufacturer's recommendations. Breakthrough times >480 mins (thickness ≥0.1 mm). When skin contact is possible for other than the hands, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn. Protective clothing must be cleaned thoroughly after each use.

Respiratory: No specific measures required.

Thermal: No hazard

Additional Remarks: Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse. Use care in walking on spilled material. Material spilled on hard surfaces can be a serious slipping/falling hazard.

8.2.3. Environmental exposure controls

No specific measures identified for normal handling and use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid.

Colour: Green to white or off-white

Odor: Slight vinegar odour.

Melting Point: > 100 °C

Boiling Point: > 100 °C

Flammability: not flammable

Lower/Upper Flammable Limit: Not applicable

Flash Point: No Data Available

Auto-Ignition temperature: No data available

Decomposition temperature: No data available.

pH: 7 (concentration dependent)

Viscosity: Not applicable.

Solubility (Water): Soluble in water but dissolves very slowly.

Partition Coeffecient (KOW): No Data Available.

Vapor Pressure: No data available

Relative density: ~1.1

Vapour density: No data available

Particle characteristics: Not applicable, bulk form

Other information : No relevant data identified

SECTION 10: STABILITY AND REACTIVITY

10.1: Reactivity

No hazardous reactions identified. Does not react with air, water or other common materials.

10.2. Chemical Stability

This product is stable.

10.3. Possibility of hazardous reactions

None identified. Hazardous polymerization will not occur.

10.4. Conditions to Avoid

High temperatures.

10.5. Incompatible materials

Oxidising agents. Strong bases may cause the release of ammonia.

10.6. Hazardous Decomposition Products

Carbon and nitrogen oxides (CO, CO_2 NO_x)

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes

Acute Toxicity: This product is of a low order of acute toxicity. Oral LD50 (Rat) >5000 mg/kg

Skin Irritation: Mild to moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin

Eye irritation: Transient mild to moderate irritation can occur.

Respiratory of skin sensitization: No known effects.

Germ cell mutagenicity: No known effects

Carcinogenicity: No known effects

Reproductive toxicity: No known effects

Specific target organ toxicity – single exposure: No known effects

Specific target organ toxicity – repeated exposure: No known effects

Aspiration hazard: not applicable for solids

11.2. Other information

The substance is not expected to have endocrine disrupting properties. No other relevant information identified.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Ecotoxicity

Fish (Oncorhynchus mykiss): 96 hr LC_{50}: 140- 150 mg/L.

Invertebrates (Daphnia magna): 48 hr EC_{50}: ≥ 125 mg/L.

12.2. Persistence and Degradability

Not readily biodegradable but complete mineralization is expected under environmental exposure. Degradation initialization and rate are dependent on UV levels.

12.3. Bioaccumulation potential

The product is not expected to bioaccumulate.

12.4. Mobility in soil

The product is designed to bind to sediment and soil, so it is not expected to suffer from leaching or mobility.

12.5. Results of the PBT assessment

This product does not meet the criteria of a PBT or vPvB substance.

12.6 Endocrine disrupting properties

The substance is not expected to have endocrine disrupting properties

12.7 Other adverse effects

None identified

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods: Dispose of all waste must be in accordance with all applicable national and local health and environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 14: TRANSPORT INFORMATION

14.1: UN number: Not applicable. The products is not classified as dangerous for transport.

14.2: UN proper shipping name: The products is not classified as dangerous for transport.

14.3: Transport hazard classes: Not applicable. The products is not classified as dangerous for transport

14.4: Packing group: Not applicable. The products is not classified as dangerous for transport

14.5: Environmental hazards: None identified.

14.6: Special precautions for users: None identified.

14.7. Maritime transport in bulk: Not applicable. The products is not classified as dangerous for transport

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/ legislation specific for the product

EU REACH: All components of this product have been registered with the European Chemicals Agency or are exempt from registration.

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

15.2. Chemical Safety Assessment

A chemical safety assessment has not been carried out for this product.

SECTION 16: OTHER INFORMATION

DATE: December 2022: First issue:

DISCLAIMER OF RESPONSIBILITY

Information contained in this publication, while accurate to the best knowledge and belief of Frog Environmental Ltd (FEL) is not intended and should not be construed as a warranty or representation for which FEL assumes any legal responsibility.

Any information or advice obtained from FEL otherwise than by means of this publication is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that the product is suitable for the particular purpose intended. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product.

FEL accepts no liability whatsoever (except as otherwise expressly provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of FEL materials or the use of FEL materials in conjunction with such other materials. The information in this safety data sheet relates only to the product designated herein, and does not relate to its use in combination with any other material.

SAFETY DATA SHEET

Gel Flocculant 494

SECTION 1: IDENTIFICATION OF MIXTURE AND COMPANY

1.1 Product identifier

Gel Flocculant 494

CHEMICAL FAMILY: Polyacrylamide polymer

CAS NUMBER: none identified

CHEMICAL NAME: none identified

1.2 Relevant Identified Uses

Water treatment

1.3 Supplier

Frog Environmental Ltd

Business Contact

The Byre

0345 057 4040

Blackenhall Park

Emergency Contact

Bar Lane

Staffordshire DE13 8AJ

0345 057 4040 (not 24 hours)

24 Hour Emergency Contact

UK National Poisons Information Service: 0344 892 0111

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification

Not classified according to EU regulation 1272/2008 as implemented in The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019.

2.2 Label elements

No labeling required

2.3. Other hazards

No component meets the criteria of a PBT or vPvB substance according to EU regulation 1907/2006 as implemented in The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019 (as amended)

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

There are no components present, within the current knowledge of the supplier that are classified as hazardous to health or the environment and present at concentrations that require reporting in this section.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid.

Skin

Wash skin with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If irritation occurs get medical attention.

Inhalation

Remove exposed person to fresh air. Seek medical attention if the patient feels unwell.

Eye

Flush eyes with large amounts of water for at least 15 minutes, lifting eyelids to insure complete flushing of surface. Seek medical attention if irritation persists.

Ingestion

Keep at rest. Never give anything by mouth to an unconscious person. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Keep airway clear. Seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed.

Signs and Symptoms of Acute Exposure

Inhalation: vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.

Ingestion: May cause irritation of the lining of the stomach.

Skin: Mild to moderate irritation can occur.

Eyes: Can cause mild to moderate irritation.

Chronic Health Effects

Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness. No known other chronic effects.

4.3 Indication of any immediate medical attention and special treatment needed.

Treat symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

5.1. Extinguishing Media

Suitable: Use extinguishing media suitable for the surrounding fire..

Unsuitable: None.

5.2. Special hazards arising from the mixture

Hazardous Combustion Products: Carbon and Nitrogen Oxides (CO, CO_2, NO_x)

5.3. Advice for Firefighters

Protective Equipment/Clothing: Wear full protective clothing including positive pressure self-contained breathing apparatus.

Fire Fighting Guidance: Fight large fires from maximum distance or use unmanned hose handlers or monitor nozzles. Move containers from fire area if you can do it without risk. Cool containers with flooding quantities of water until after fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear appropriate protective equipment (see section 8). Wet product and aqueous solutions of product are very slippery. Trace amounts of product on smooth surfaces can become extremely slippery when wet.

6.2 Environmental precautions

Prevent entry of concentrated solutions into waterways or sewers.

6.3. Methods and materials for containment and clear up

Sweep or scoop dry material and place in appropriate container. Absorb aqueous solutions with a dry inert material, such as clay, and place in an appropriate waste disposal container. After most of the material has been recovered, clean the area with warm, soapy water.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Normal precautions common to good manufacturing practice should be followed in handling and storage. Open and handle container with care. Keep the containers closed when not in use. Avoid physical damage to blocks. Use appropriate personnel protective equipment (See section 8).. Avoid contact with eyes, skin, and clothing. Do not ingest. After handling, wash hands thoroughly with soap and water.

7.2. Conditions for safe storage, including any incompatibilities.

Store in a cool, dry area. Store in accordance with good industrial practices. Keep away from direct sunlight. Protect against physical damage.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1. Control parameters

None identified.

8.2. Exposure controls

8.2.1. Engineering Controls

No specific measures required

8.2.2. Individual Personal Protection

Eye Safety: glasses are required as a minimum. Use splash goggles or a face shield when eye contact due to splashing is possible.

Skin: Wear nitrile, butyl or Viton® gloves. The specification of glove depends on the work being undertaken; consult manufacturer's recommendations. Breakthrough times >480 mins (thickness ≥0.1 mm). When skin contact is possible for other than the hands, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn. Protective clothing must be cleaned thoroughly after each use.

Respiratory: No specific measures required.

Thermal: No hazard

Additional Remarks: Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse. Use care in walking on spilled material. Material spilled on hard surfaces can be a serious slipping/falling hazard.

8.2.3. Environmental exposure controls

No specific measures identified for normal handling and use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid

Colour: Yellow to white or off-white

Odor: Slight vinegar odour

Melting Point: > 100 °C

Boiling Point: > 100 °C

Flammability: not flammable

Lower/Upper Flammable Limit: Not applicable

Flash Point: No data available

Auto-Ignition temperature: No data available

Decomposition temperature: No data available

pH: 5-7.5 (concentration dependent)

Viscosity: Not applicable

Solubility (Water): Soluble in water but dissolves very slowly

Partition Coeffecient (KOW): No data available

Vapor Pressure: No data available

Relative density: ~1.1

Vapour density: No data available

Particle characteristics: Not applicable, bulk form

Other information : No relevant data identified

SECTION 10: STABILITY AND REACTIVITY

10.1: Reactivity

No hazardous reactions identified. Does not react with air, water or other common materials

10.2. Chemical Stability

This product is stable

10.3. Possibility of hazardous reactions

None identified. Hazardous polymerization will not occur

10.4. Conditions to Avoid

High temperatures

10.5. Incompatible materials

Oxidising agents. Strong bases may cause the release of ammonia

10.6. Hazardous Decomposition Products

Carbon and nitrogen oxides (CO, CO_2 NO_x)

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes

Acute Toxicity: This product is of a low order of acute toxicity. Oral LD50 (Rat) >5000 mg/kg

Skin Irritation: Mild to moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin

Eye irritation: Transient mild to moderate irritation can occur

Respiratory of skin sensitization: No known effects

Germ cell mutagenicity: No known effects

Carcinogenicity: No known effects

Reproductive toxicity: No known effects

Specific target organ toxicity – single exposure: No known effects

Specific target organ toxicity – repeated exposure: No known effects

Aspiration hazard: not applicable for solids

11.2. Other information

The substance is not expected to have endocrine disrupting properties. No other relevant information identified

SECTION 12: ECOLOGICAL INFORMATION

12.1. Ecotoxicity

Fish (Oncorhynchus mykiss): 96 hr LC_{50}: > 2500 mg/L.

Invertebrates (Daphnia magna): 48 hr EC_{50}: immobility 705 mg/L.

12.2. Persistence and Degradability

Not readily biodegradable but complete mineralization is expected under environmental exposure. Degradation initialization and rate are dependent on UV levels.

12.3. Bioaccumulation potential

The product is not expected to bioaccumulate.

12.4. Mobility in soil

The product is designed to bind to sediment and soil, so it is not expected to suffer from leaching or mobility.

12.5. Results of the PBT assessment

This product does not meet the criteria of a PBT or vPvB substance.

12.6 Endocrine disrupting properties

The substance is not expected to have endocrine disrupting properties

12.7 Other adverse effects

None identified

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods: Dispose of all waste must be in accordance with all applicable national and local health and environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 14: TRANSPORT INFORMATION

14.1: UN number: Not applicable. The products is not classified as dangerous for transport.

14.2: UN proper shipping name: The products is not classified as dangerous for transport.

14.3: Transport hazard classes: Not applicable. The products is not classified as dangerous for transport

14.4: Packing group: Not applicable. The products is not classified as dangerous for transport

14.5: Environmental hazards: None identified.

14.6: Special precautions for users: None identified.

14.7. Maritime transport in bulk: Not applicable. The products is not classified as dangerous for transport

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/ legislation specific for the product

EU REACH: All components of this product have been registered with the European Chemicals Agency or are exempt from registration.

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

15.2. Chemical Safety Assessment

A chemical safety assessment has not been carried out for this product.

SECTION 16: OTHER INFORMATION

DATE: December 2022: First issue:

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FEL accepts no liability whatsoever (except as otherwise expressly provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of FEL materials or the use of FEL materials in conjunction with such other materials. The information in this safety data sheet relates only to the product designated herein, and does not relate to its use in combination with any other material.

Section 1: Identification of Substance/mixture and of the company undertaking

1.1: Product Identifier

Product Name AQUATREAT 2084

1.2: Relevant Identified use of substance/mixture and uses advised against

1.3: Details of the Supplier of the safety data sheet

Company Name: Aquatreat
Albany House
North Dock
Llanelli
Carmarthenshire
SA15 2LF

Telephone: 01554 775236
Fax: 01554 772253
E-mail: enquiries@aquatreat.co.uk
Website: www.aquatreat.co.uk

1.4: Emergency Telephone Numbers:

Emergency Telephone: 0333 333 9499

Section 2: Hazards Identification

2.1: Classification of substance/mixture according to Regulation (EC) No 1272/2008

Classification under CLP: None Not Classified

Additional Information:

2.2: Label Elements: Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Label elements under CLP: None This product has no classification or label elements under CLP

Signal Words:

Hazard Pictograms:

2.3: Other Hazards

Section 3: Composition information on hazardous ingredients

Hydrocarbons, C12 - C15, isoalkanes, cyclics <2% aromatics

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
920-107-4		H302; ASP Tox.1	20 - 45

Isotridecanol, ethoxylated

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
Polymer		H318;Eye Dam.1, H302; Acute Tox.4	<5

Section 4: First Aid Measures

4.1: Description of First Aid measures

Skin Contact: Wash off immediately with soap and plenty of water and remove all contaminated clothing and shoes. In case of persistent skin irritation, consult a physician.

Eye Contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Alternatively, rinse immediately with Diphoterine. Get prompt medical attention

Ingestion: Rinse mounth with water. DO NOT induce vomiting. Call a physician or poison control centre immediately.

Inhalation: Move to fresh air. No hazards which require special first aid measures.

4.2: Most important symptoms and effects both accute and delayed

Skin Contact: None under normal use

Eye Contact: None under normal use

Ingestion: None under normal use

Inhalation: None under normal use

4.3: Indication of any immediate medical treatment and special treatment required

None reasonably foerseeable.

Section 5: Fire fighting measures

5.1: Extinguishing media

Water. Water spray. Foam. Carbon dioxide (CO2). Dry Powder.
Warning! Spills produce extremely slippery surfaces.

Unsuitable Media

None

5.2: Special hazards arising from the substance/mixture

Oxides of Carbon and Nitrogen. Hydrogen cyanide may be produced as a result of combustion in an oxygen deficient atmosphere.

5.3: Advice for firefighters

Wear self contained breathing apparatus and protective suit.
Spills become extremely slippery when wet

Section 6: Accidental Release Measures

6.1: Personal precautions, protective equipment and emergency procedures

Do not touch or walk through spilled material. Spills produce extremely slippery surfaces.
Wear afequate personal protective equipment.
Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2: Environmental precautions

Do not allow spills to enter surface water drains and watercourses

6.3: Methods and Materials for containment and clean up

Small spills: Do not flush with water. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.
Large spills: Do not flush with water.Dam up. Soak up with inert absorbent material. Clean up promptly by scoop or vacuum.
Residues: After cleaning, flush away traces with water.

6.4: References to other sections

Section 7.0: Handling and Storage

7.1: Precautions for safe handling

Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled.
Do not eat, drink or smoke when using this product.

7.2: Conditions for safe storage.

Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material. Incompatible with oxidising agents

7.4: Specific End Use(s)

Section 8: Exposurecontrols/PersonalProtection

8.1: Control Parameters

None known

8.2: Exposure Controls

Engineering Measures	Use local exhaust ventilation if misting occurs. Natural ventilation is adequate in absence of mists.
Respiratory Protection	No personal respiratory protective equipment normally required.
Hand Protection	PVC or other plastic material gloves
Eye Protection	Safety glasses with side shields
Skin Protection	Coveralls or chemical apron and rubber footwear where physical contact can occur. Wash hands before breaks and at the end of workday. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

Section 9.0: Physical and ChemicalProperties

9.1: Information on basic physical and chemical properties

State:	Liquid
Colour:	Milky
Odour:	Aliphatic
Specific Gravity:	1.0-102
pH:	5 - 8 @5g/l

9.2: Other Information

Section 10: Stability and Reactivity

10.1: Reactivity

Stable under recommended conditions of storage and use

10.2: Chemical Stability

Stable under recommended conditions of storage and use

10.3: Possibility of Hazardous Reactions

None known

10.4: Conditions to Avoid

Heat, Sunlight and frost

10.5: Incompatible Materials

Oxidising Agents

10.6: Hazardous Decomposition Products

Thermal decomposition may produce: nitrogen oxides (NOx), carbon dioxide (COx). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combusion in an oxygen deficient atmosphere.

Section 11: Toxicological Information

Aqautreat 2084

Dermal	Rat	LD50	>5000 mg/kg (estimated)

Aquatreat 2084

Oral	Rat	LD50	>5000 mg/kg (estimated)

Section 12: Ecological Information

12.1: Toxicity

LC50/Oncorhyncus myKiss/ 96hours>100mg/l (estimated), EC50/Daphnia Magna/48 hours>100mg/l (estimated), IC50/Algae/72 hours>100mg/l(estimated)

12.2: Persistence and Biodegradable

Not readily biodegradable

12.3: Bioaccumulative Potential

This product is not expected to bioaccumulate

12.4: Mobility in Soil

No data available

12.5: Results of PBT and vPvB Assessment

Not according to the criteria of Annex XIII of REACH

12.6: Other adverse effects

None

Section 13: Disposal Information

Dispose of waste in accordance with local or national regulations

Section 14: Transport Information

UN Number	
Shipping Name	Not classified as hazardous for transport
Transport Class	
Packing Group	
Environment Hazard	
Special Precautions	
Tunnel Code	
Transport Category	

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Section 15: Regulatory Information

15.1: Safety, Health and Environmental regulations/legislation specific for the substance/mixture

All components of this product have been registered or pre-registered with the European Chemical Agency or are exempt from registration.

15.2: Chemical safety assessment

Section 16: Other information

The above information is based on our present knowledge of the product at the time of publication. It is given in good faith, no warranty is implied as to the quality or specification of the product. Information contained in this data does not constitute an assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for their purpose

Material Safety Data Sheet

Section 1: Identification of Substance/mixture and of the company undertaking

1.1: Product Identifier

Product Name PAC 10%

1.2: Relevant Identified use of substance/mixture and uses advised against

1.3: Details of the Supplier of the safety data sheet

Company Name: Aquatreat
Albany House
North Dock
Llanelli
Carmarthenshire
SA15 2LF

Telephone: 01554 775236
Fax: 01554 772253
E-mail: enquiries@aquatreat.co.uk
Website: www.aquatreat.co.uk

1.4: Emergency Telephone Numbers:

Emergency Telephone: 0333 333 9499

Section 2: Hazards Identification

2.1: Classification of substance/mixture according to Regulation (EC) No 1272/2008

Classification under CLP:	H290	Met Corr. 1
	H318	Eye Dam. 1
	H318	Eye Dam. 1

Additional Information:

2.2: Label Elements: Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Label elements under CLP:	H290	May be corrosive to metals
	H318	Causes serious eye damage
	H318	Causes serious eye damage

Signal Words: DANGER

Hazard Pictograms:

Precautionary Statements

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P361 Remove immediately all contaminated clothing.

2.3: Other Hazards

Section 3: Composition information on hazardous ingredients

Polyaluminium Chloride: REACH Registration number 01-2119531540-51

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
245-400-7	39290-78-3	H290: Met Corr.1; H318 Eye Dam.1	10

Section 4: First Aid Measures

4.1: Description of First Aid measures

Skin Contact: Remove affected person from source of exposure. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention promptly if symptoms occur after washing

Eye Contact: Remove victim immediately from source of exposure. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

Ingestion: Never make an unconscious person vomit or drink fluids. Rinse mouth thoroughly. Get medical attention immediately

Inhalation: Remove victim from source of exposure. Keep the affected person warm and at rest. Get prompt medical attention

4.2: Most important symptoms and effects both accute and delayed

Skin Contact: May cause serious chemical burns to the skin

Eye Contact: May cause serious eye damage

Ingestion: May cause burns in mucous membrane, throat, oesophagus and stomach

Inhalation: May cause burns to mucous membrane in nose, throat, lungs and bronchial system

4.3: Indication of any immediate medical treatment and special treatment required

No information available

Section 5: Fire fighting measures

5.1: Extinguishing media

Use fire extinguishing media appropriate for the surrounding materials.

Unsuitable Media

None known

5.2: Special hazards arising from the substance/mixture

May evolve corrosive gases/vapours/fumes of Hydrogen Chloride and Sulphurous gases in combustion or at high temperatures

5.3: Advice for firefighters

Wear acid resistant protective clothing and self contained breathing apparatus. Water spray should be used to cool containers

Section 6: Accidental Release Measures

6.1: Personal precautions, protective equipment and emergency procedures

Wear PPE as outlined in section 8

6.2: Environmental precautions

Avoid discharge into water courses or onto ground.

6.3: Methods and Materials for containment and clean up

Stop leak if possible without risk. Dam and absorb with sand, earth or other non combustible material. Shovel into dry containers and dispose of as special waste. Flush area with water

6.4: References to other sections

Section 7.0: Handling and Storage

7.1: Precautions for safe handling

Wear full protective clothing for prolonged exposure and or high concentrations. Eye wash facilities and emergency shower must be available when handling this producrt

7.2: Conditions for safe storage.

Use storage tank made of suitable plastic material or plastic lined steel drum.

7.4: Specific End Use(s)

Section 8: Exposurecontrols/PersonalProtection

8.1: Control Parameters

Soluble Aluminium Salts

8 Hour TWA: 2 mg/m3 **15MinSTEL:**

8.2: Exposure Controls

Engineering Measures	Provide adequate ventilation. Eye wash and emergency shower should be available.
Respiratory Protection	Respiratory protection required in case of aerosol formation
Hand Protection	PVC or rubber gloves.
Eye Protection	Goggles or face shield.
Skin Protection	Lightweight protective clothing, rubber or plastic apron

Section 9.0: Physical and ChemicalProperties

9.1: Information on basic physical and chemical properties

State:	Liquid
Colour:	Light or pale yellow
Odour:	Almost odourless
Specific Gravity:	1.2
pH:	0.5 - 1.0

9.2: Other Information

Section 10: Stability and Reactivity

10.1: Reactivity

In contact with metals generates hydrogen gas which can form explosive mixtures

10.2: Chemical Stability

Stable at ambient temperature

10.3: Possibility of Hazardous Reactions

10.4: Conditions to Avoid

Avoid excessive heat for prolonged periods of time. Avoid contact with acids

10.5: Incompatible Materials

Avoid contact with chlorites, hypochlorites and sulfites. Incompatible with other aluminium salts and iron salts.

10.6: Hazardous Decomposition Products

Hydrogen Chloride may be evolved during fire or at high temepratures

Section 11: Toxicological Information

No data available

Section 12: Ecological Information

12.1: Toxicity

12.2: Persistence and Biodegradable

Hydrolyses when diluted in water forming AL(OH)3

12.3: Bioaccumulative Potential

The product is not bioaccumulating

12.4: Mobility in Soil

No data available

12.5: Results of PBT and vPvB Assessment

No data available

12.6: Other adverse effects

Product is acidic and will reduce the pH of water courses and drains, and cause damage to fauna and flora. It should not be allowed to enter controlled waters in large quantities - in such cases the National Rivers Authority should be contacted.

Section 13: Disposal Information

Dispose of in accordance with local and national regulations

Section 14: Transport Information

UN Number	UN3264
Shipping Name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (polyaluminium chloride)
Transport Class	8
Packing Group	II
Environment Hazard	No

Special Precautions	Emergency Action Code 2X		
Tunnel Code	E	Transport Category	2

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Section 15: Regulatory Information

15.1: Safety, Health and Environmental regulations/legislation specific for the substance/mixture

15.2: Chemical safety assessment

Section 16: Other information

The above information is based on our present knowledge of the product at the time of publication. It is given in good faith, no warranty is implied as to the quality or specification of the product. Information contained in this data does not constitute an assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for their purpose