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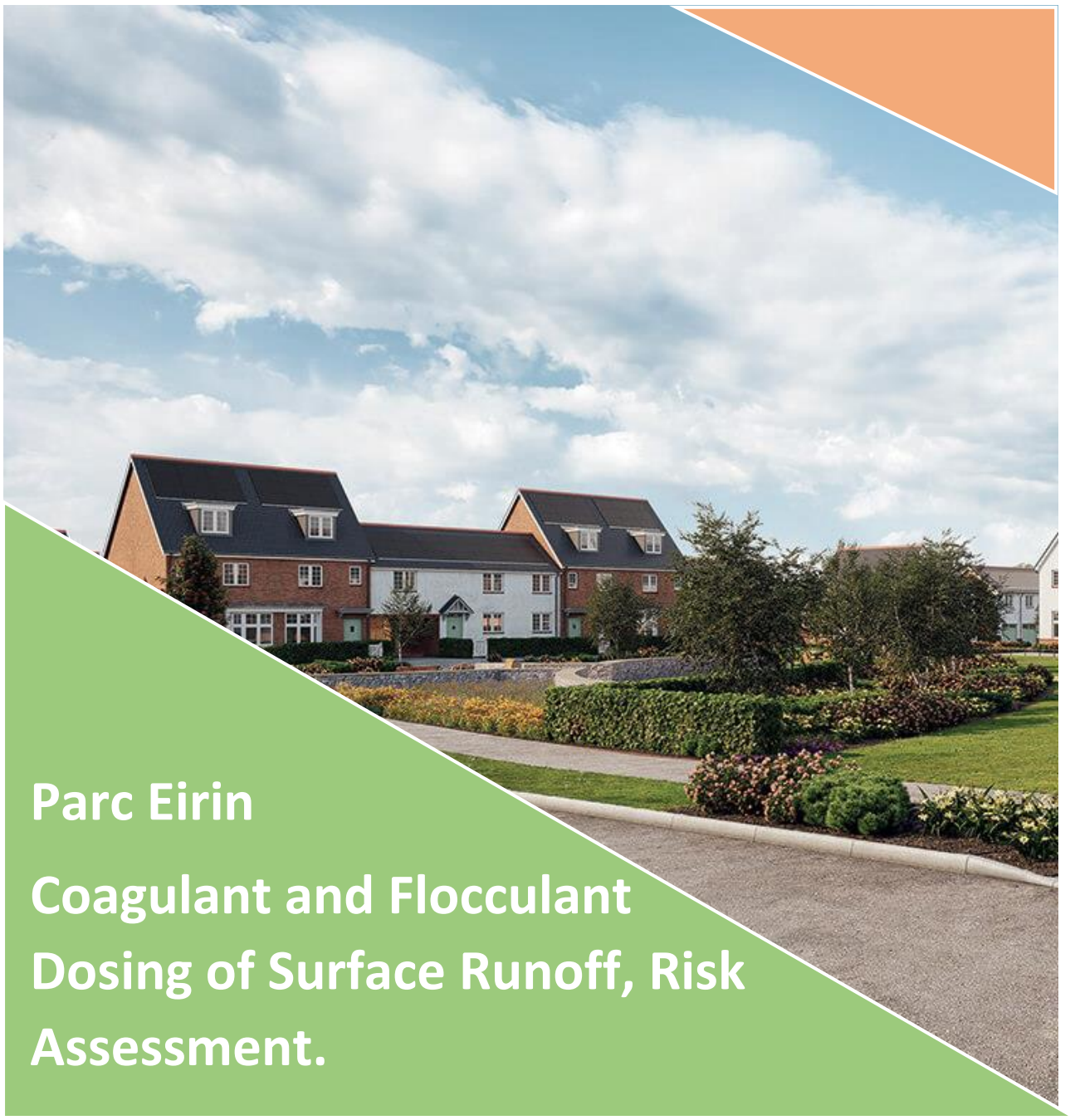

Parc Eirin

Coagulant and Flocculant Dosing of Surface Runoff, Risk Assessment.

EcoVigour

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Contents

1 Introduction

Morganstone Homes are currently constructing Parc Eirin which is a development to construct 205 low carbon Eco-Homes in Tonyrefail in the Ely Valley. The scheme is being funded by Pobl Group and the Welsh Government.

Figure 1 - Approximate Site Extents

The Parc Eirin site slopes from the SW to the SE over a shallow gradient. The Nant Erin flows in a west to east direction around the northern and eastern boundaries of the site.

The site is comprised of a heavily compacted engineered fill, comprising a high percentage of colliery shale, overlain by a thin layer of topsoil, which has probably been created by vegetation decomposition. Due to this there is little infiltration into the sites surface with rainfall lying on the surface and running towards the swales around the northern and eastern boundaries and then into the Nant Erin, which flows around the northern and eastern boundaries.

Groundwater at the site is shallow and artesian, in places, several boreholes have been sunk for the installation of ground source heat pumps and these have emitted a steady flow of water.

The site covers an area of approximately 68,000m^2 but approximately 42,000m^2 of this has been built out and drains into Swales 1 and 2, which have separate outfall into the Nant Eirin. The remainder of the site drains into Swales 2 and 3, which discharge via a separate outfalls into the Nant Eirin.

Using the ADAS method for the calculation of runoff, using a catchment length of 290m (the total diagonal length of the site), for a 1 in 100 return period, the maximum runoff volume will be 168l/s. The Time of Concentration for this scenario is 9.1hrs i.e. a drop of rain falling on the SW corner of the site would take 9.1 hrs to cross the site to the Nant Erin. This flow rate therefore requires a sustained period of rain and therefore in reality will be approximately 30% lower. We will therefore

assume a maximum discharge rate of 117l/s. The attenuation Swales along the site boundaries are comprised of buried SDS plastic crates, covered with a layer of clean stone, which allows water to percolate through into the crates below and once the crates are full the water will rise through the stone to form a shallow pond. The swales discharge at 3 locations as illustrated in Figure 2. These outfalls have been fitted with hydrobrake flow control and discharge at the following rates:

- Outfall 1 – 7l/s at a Design Head of 2.27m
- Outfall 2 – 29l/s at a Design Head of 2.65m
- Outfall 3 – 18l/s at a Design Head of 2.35m

Storage capacity for the attenuation of flows, is achieved using the 3 underground plastic crate attenuation swales.

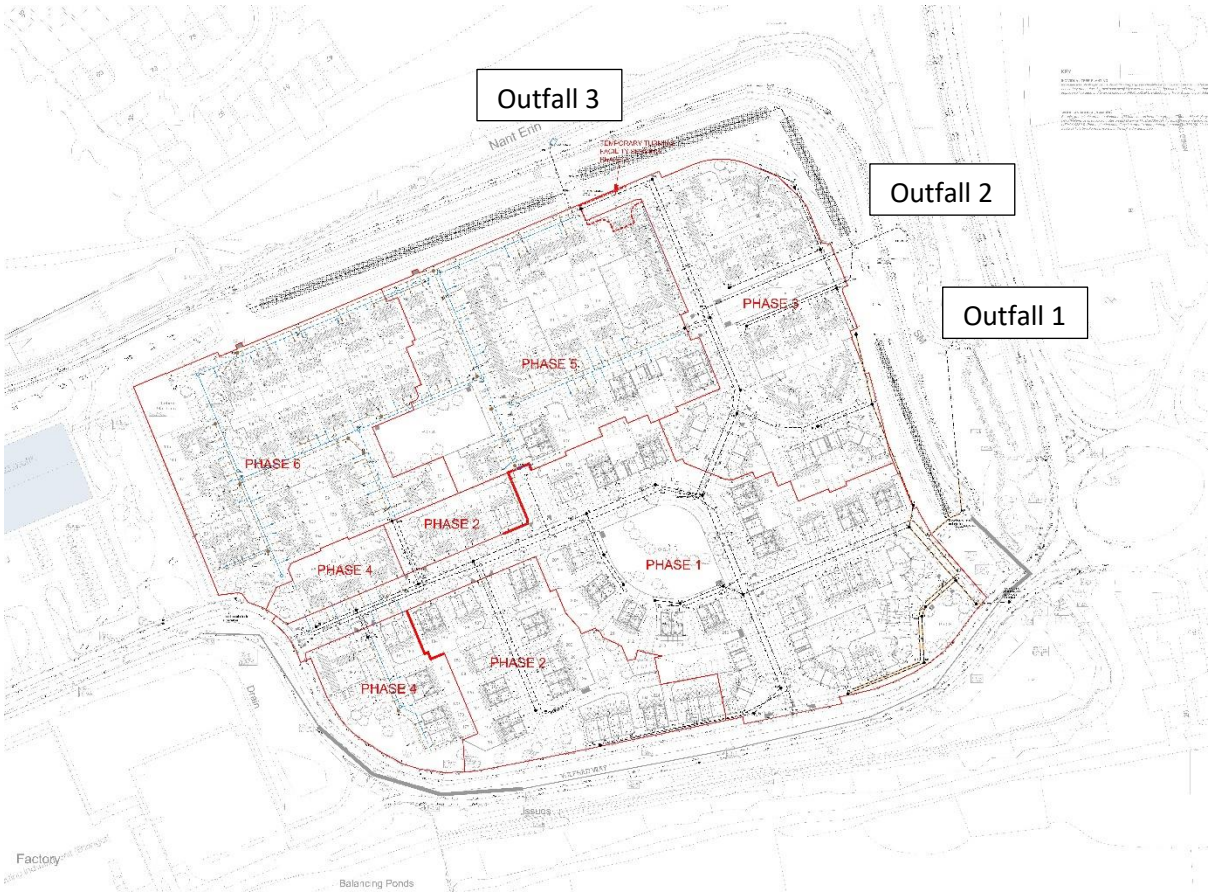

Figure 2 – Outfall Locations, Discharge will be from Outfall 2

2. Principles of Water Management for Parc Eirin

The principles of pollution control for the site are:

- Keep the working footprint to a minimum and vegetate any areas which are not being used, to minimise runoff and exposed soil;
- Contain clean runoff, from areas which are not being worked or have been completed and divert away from works areas, thus keeping areas dryer and preventing this runoff from becoming contaminated. Discharge surface runoff from completed areas, via permanent drainage and runoff from construction areas, via construction treatment systems;
- Divert runoff from sections of the site into localised treatment zones discharging via multiple discharge points into a central treatment area;
- Construct central attenuation ponds, with as large a surface area as possible to contain, attenuate runoff and allow suspended solids to gravity settle out. These ponds will be designed to maintain laminar flow and water will always be discharged from the surface of the ponds;
- Confine site traffic to hard surfaced haul roads to minimise agitation of suspended solids;
- Capture and attenuate runoff to allow suspended solids to settle out;
- Direct and filter runoff to break the force and prevent further scour of fines.

Additional to this, Morganstone Homes would like the option to utilise coagulant and flocculant treatment to bind colloidal suspended solids together, increase their mass and increase settling velocity. Morganstone have therefore contracted Siltbuster Ltd to supply this system, as required.

Discussions with NRW have indicated that the use of this system will require an Environmental Permit to Discharge, as discharge from this process is considered as a Trade Effluent.

This document assesses the risk to water quality in the Nant Eirin and the downstream watercourses due to the use of this process.

Surface runoff from construction areas is currently gravity fed / pumped into the primary settlement attenuation lagoon system as illustrated in Drawing No 248 below and in Appendix 1. This is a seven lagoon system, constructed into the shallow gradient of the site, where water is taken from the surface of each lagoon and discharged into the downstream lagoon maintaining laminar flow as best as possible.

This water is then discharged into Swale 2, which curves around the NE corner of the site. This swale is comprised of a buried SDS plastic crate system, which discharges via a hydrobrake flow control device into the Nant Eirin from Discharge 2 (Grid Reference SS 99438 87742).

Runoff from the area to the east of the ponds is actively drained into the site drainage system and is then pumped from Manholes S54 and S28 (marked in blue on Drawing No 248) into Pond 1 and allowed to attenuate through the pond system, allowing suspended solids to gravity settle, prior to discharge into Swale 2.

As the ponds have been constructed for use as attenuation ponds, i.e. water is abstracted from the surface of the water, there is no potential to utilise these to store water and buffer flows, to maintain a constant flow through the siltbuster system.

It is therefore proposed to place a 750mm VetaStopper Bung into the downstream side of the flow control chamber from Swale 2 and to utilise Swale 2 as a storage pond to buffer flows for the Siltbuster system. Water will then be abstracted from the flow control chamber of Swale 2 and treated within the Siltbuster Dosing Tanks and then attenuated in the HB50 Lamella Clarifier, to remove suspended solids prior to discharge into the downstream side of the flow control chamber, where it will be discharged via Outfall 2.

This will ensure that all runoff from construction areas is discharged via the Siltbuster.

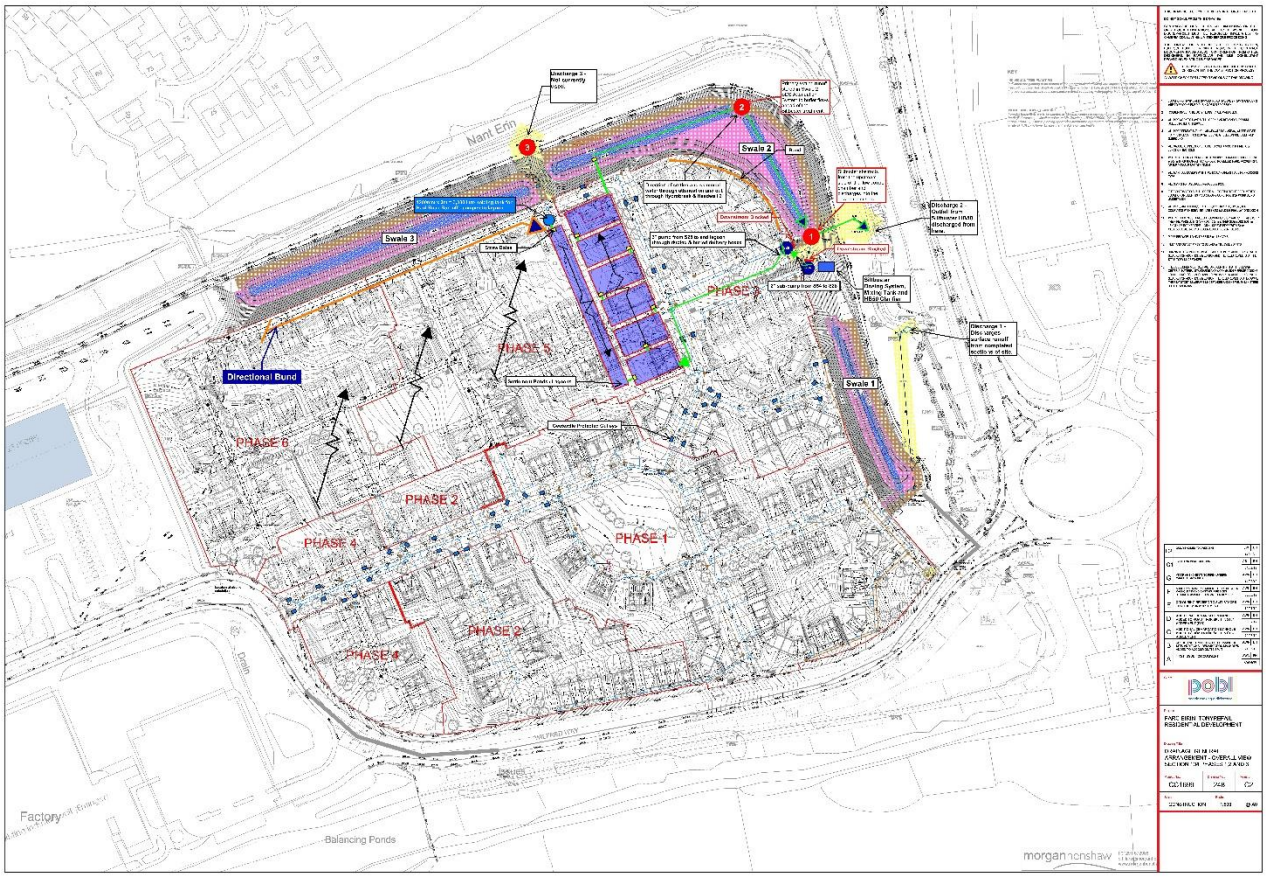

Figure 3 – Drawing No 248 – Layout of Drainage and Water Control Measures,

Figure 4 – Nant Eirin and Outfall 2 Headwall

3 Siltbuster System and Coagulants / Flocculants to be used.

- The current proposed treatment system is configured to operate with flows between 4 and 40 m^3/h. Where flows exceed 40 m^3/h it is likely that increased suspended solids will remain in the outflow water. From experience with this system we are targeting 20 – 25m^3/h as a discharge. With the slight buffering effect of the attenuation ponds and the volume of Swale 2, a discharge of 10m^3/h would be sufficient and hence there is scope to fine tune throughput to achieve maximum efficiency.
- The pH of the water must be within the required 6-9 pH range that is typically required for discharge to water course. It is considered likely that due to the composition of the site material, there will be requirements to neutralise acidic waters to a more neutral value prior to discharge. This is achieved through the automatic introduction of Sodium Hydroxide (NaOH).
- The local geology is comprised of superficial glacial till and a bedrock of mudstone, siltstone, and sandstone (South Wales Lower Coal Measures). This results in the surface geology being likely to contain clay and silt particles as well as a reduced pH.
- Following chemical pre-treatment suspended solids will be recovered using a Siltbuster HB50 (gravity operated) Settlement Unit which will remove the particles from suspension and capture them within the unit's twin hoppers.

3.1 Siltbuster 3-Stage Chemical Pre-Treatment System

Fine particles in suspension often have negative electrical surface charges. These prevent aggregation, due to repulsive forces between them, hence the particles remain in suspension. Coagulation is a chemical process that involves the neutralization of these charges. A coagulant is typically a positively charged metal ion, generally iron or aluminium, depending on the receiving water. When added, the destabilized particles are able to start coming together forming micro floc.

Following coagulation and the formation of micro flocs, a long string organic polymer flocculant will be added to bind micro flocs together into more stable flocs, with sufficient mass to gravity settle from the water.

The chemical treatment will comprise:

- Inlet electromagnetic flow meter to record the volume of water to be treated and allow flow proportional dosing of coagulant and polymer.
- Mix Tank to allow the controlled mixing of the treatment chemicals ensuring flocculation of the solids (size dependent on flow).
- Flow proportional control system for coagulant and flocculant polymer dosing. The use of the flow proportional dosing system minimises the risk associated with the overdosing of the treatment chemicals.
- pH adjustment system (Sodium Hydroxide) to raise the pH after coagulant addition.
- Coagulant dosing pump and associated pipework to allow the automatic flow proportional addition of the coagulant.

- Flocculant make-up system complete with 1000 litre make up tank, mixer bridge 110 V (32 Amp) mixer complete with paddle (potable water will be used for polymer dilution) and peristaltic flow proportional dosing pump.
- 1 No IBC spill stand/containment bunds for the temporary storage of chemicals.
- 1 No. Siltbuster HB50 Lamella Clarifiers (dependent on flow rate) to separate the suspended solids from the treated water. An additional clarifier can be added if additional capacity is required.

The HB50 settlement unit captures and retains particles that settle faster than the velocity of the water through the Siltbuster lamella plates. Following dosing in the chemical pre-treatment system virtually all particles will be retained in the HB50 unit's bottom hopper with visually clear water being sent to the discharge point.

The mixing tanks and HB50 will be placed on a level stoned area.

Figure 5 – Example of a 4 – 40m³/h, 2 Stage Chemical Treatment System (Mix Tank set up)

4. Coagulant and Flocculant to be used

Prior to commissioning of the system, technicians from Siltbuster will attend site and will take water samples from the upstream side of the Flow Control chamber. These will be returned to the Siltbuster laboratory and tested for Total Suspended Solids (TSS), iron (total and dissolved) and pH. This information will be used to inform the choice of coagulant and dosing rates for coagulant, flocculant and pH adjustment and programme the micro computer which will undertake the dosing.

Samples will also be taken form the Nant Eirin to further inform the choice of coagulant. It will be important to determine current iron levels within the watercourse, which from a visual assessment appear to be high (orange, ferrous oxide staining of the bed of the watercourse).

4.1 Coagulant:

Ferric Chloride 25 – 99% - Active component Iron Trichloride, supplied as a liquid in 1000l IBC.

4.2 Flocculant:

Aquatreat EM533 – Anionic Polymer – This is supplied in a 1000l IBC, as an emulsion.

4.3 pH Adjustment (if required):

Caustic Soda Liquor >=2% - <=50% - Active component sodium hydroxide – supplied as a liquid.

Coagulant is supplied in liquid form ready to dose, the flocculant comes in a concentrated form and needs to be diluted using treated water to achieve the required working strength solution, hence the need for the flocculant make-up system. This will be fed from a potable water supply on site. This will also supply a tap, within the set up to aid with sampling and maintenance of the system.

Key to the success of the treatment operation will be balancing flow to ensure that all suspended solids and flocculant / coagulant are settled from the discharge water prior to water being discharged. This will require careful monitoring of input and discharge water.

5. Maintenance:

Daily maintenance will be required of the Siltbuster system to ensure all meters and dosing pumps are operating correctly and that flow is being controlled into the system to ensure there is sufficient residence time for chemical dosing and for flocs to settle from water before it passes over the outfall weir. A proforma for these inspections will be produced in conjunction with the Siltbuster Technician.

The flow, pH and dosing meters will be checked at the start and end of each shift, to ensure that they are operating within agreed parameters. The pH will be checked at the outlet weir once per shift using pH strips, to ensure readings are the same as the sensor / gauge. A calculation will be undertaken as to the approximate dose of coagulant and flocculant to be added over a 24hr period of operation. The side of the IBC containers will be marked to allow monitoring of this dosing, to ensure that dosing is not exceeded.

If ferric chloride is used, the discharge from the Siltbusters will be monitored for iron (total FE^{2+}), using testing strips.

The Siltbuster system will be serviced by a Siltbuster engineer, monthly, or if there is any suspicion that it is not operating within agreed parameters.

The HB50 Clarifier will be maintained to ensure flocs do not build up within the hoppers, to a degree where they can be re-mobilised by water flowing through the until. This will require regular de-sludging of the unit. A desludge pond will be constructed adjacent to the siltbuter, where sludge can be removed, allowed to settle and supernatant water removed back into the treatment system. Sludge can then be disposed of, in line with the duty of care for the waste stream.

A COSHH cabinet wil be placed at the system, which will contain any small containers of chemicals, test equipment, de-sludge equipment and COSHH Data Sheets for all of the chemicals used within the process.

5.1 Monitoring:

Visual assessments will be undertaken daily at the discharge points into the Nant Erin during wet conditions (this is currently undertaken as part of the Daily Site Inspections) as this is a good instant indicator for silt contamination. The findings of these assessments will be recorded on the Site Environmental Inspection Forms.

The flow, pH and dosing meters will be checked at the start and end of each shift, to ensure that they are operating within agreed parameters. The pH will be checked at the outlet weir once per shift using pH strips, to ensure readings are the same as the sensor / gauge. A calculation will be undertaken as to the approximate dose of coagulant and flocculant to be added over a 24hr period of operation. The side of the IBC containers will be marked to allow monitoring of this dosing, to ensure that dosing is not exceeded.

If ferric chloride is used, the discharge from the Siltbusters will be monitored for iron (total FE^{2+}), using testing strips.

Formal water samples will be taken weekly from the Nant Eirin, up and downstream of Discharge 2. These will be submitted to a UKAS accredited laboratory and tested for the following parameters:

- pH
- Suspended Solids (SS)
- Iron (total and dissolved)
- Aluminium (only of a PAC based coagulant is being used)
- TPH Total C6-C40

Results will be compared against Environmental Quality Standards (EQS) and Drinking Water Standards (including Freshwaters priority hazardous substances, priority substances and other pollutants and Freshwaters specific pollutants and operational environmental quality standards (EQS)) to determine if the discharge water meets these standards.

Monitoring results shall be fed back to the Site Manager within 8hrs of being received.

If samples fail against any of these standards, further monitoring will be undertaken to determine the source i.e. monitoring of inlet water into the Siltbuster system and then site monitoring if surface and shallow / artesian groundwater.

If a trend can be established from sampling and testing, sampling frequency will be reviewed and may be reduced, provided sample results remain to be consistent.

6. Final Effluent Discharge Quality

The system is designed to deliver the following final effluent quality:

- Total Suspended Solids - >60mg/l
- Iron Dissolved – Maximum concentration - 1000µg/l
- Aluminium – To be agreed with NRW – DWS = 0.2mg/l
- pH - 6 to 8

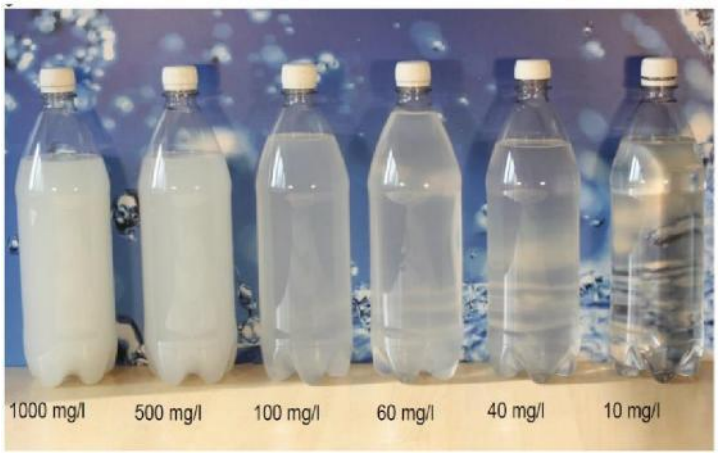

Figure 6 – Illustration of varrying SS loading

7. Risk Assessment

The following risks associated, as part of the use of the Siltbuster System have been considered:

Table 1- Specific Silt mitigation Measures to be implemented

Risk	Mitigation	Inspection Frequency
Coagulant / Flocculant being discharged into the Nant Eirin. Over dosing of the system.	Flow proportional dosing will be used to ensure that excessive chemical dosing is not used. This is reliant on the correct operation of the flow meter, pH meter and dosing pumps. The HB50 Clarifier will be maintained to ensure flocs do not build up within the hoppers, to a degree where they can be re-mobilised by water flowing through the until. This will require regular de-sludging of the unit. A de-sludge pond will be constructed adjacent to the siltbuter, where sludge can be removed and de-watered, tested and disposed of from site, in line with the duty of care for the waste stream.	Monitoring of pH and iron (total) will be undertaken of the outfall from the Siltbuster system daily, with the results recorded. Bottled samples will be taken weekly and tested for, pH Suspended Solids (SS) Iron (total and dissolved) Aluminium (only of a PAC based coagulant is being used) TPH Total C6-C40
pH of discharge water being outside of the parameters 6 – 8	As part of the commissioning of the system, a Siltbuster Technician will attend site and take water samples from the upstream side of the flow control chamber (the point at which the Siltbuster system will abstract water. These samples will be returned to the SIltbust laboratory and will be tested for Total Suspended Solids (TSS) and pH. This data will be used to define whether pH adjustment is required. The site is a former colliery and has been filled using an engineering fill, which contains colliery shale. The groundwater at the site is shallow and artesian in places, so it is likely that deeper fill will be saturated. Runoff from the site during low flow conditions has been tested and found to be very slightly acidic. Sodium hydroxide (caustic soda) may be added to reduce pH, to aid treatment.	A pH meter will be included within the Siltbuster system to enable the monitoring of pH and adjustment of NaOH. pH test strips will alsp be used to test discharge water, to ensure it is within the parameters of the permit.
Discharge water being contaminated with suspended	Bottled samples will be taken from the HB50 discharge point and will be assessed visually for turbidity. If it is found that the suspended solids loading is too high, flow into the system will be reduced using the throttle valve and the system will be checked to ensure it is operating	A visual inspection of the discharge water will be undertaken daily and the results recorded.

solids above 60mg/l	efficiently i.e has to much sludge built up in the hopers or around the outlet weir. Samples will be taken weekly and sent to a laboratory	Weekly samples will be tested for TSS.
Spillage / Leakage of coagulant, flocculant or sodium hydroxide.	The system will be inspected for leaks as part of the daily inspections. Containers of chemicals will be stored in a spill containment cell. COSHH data will be held at the Siltbuster system and within the COSHH File in the site office. If there is a spillage, the procedure within the Emergency Preparedness and Response section of this document and the Water Management Plan will be followed i.e. chemicals will not be allowed to enter surface or groundwater. Leaking fluid will be contained. Contaminated soils will be quickly excavated and placed into a quarantine area.	Daily inspection of the system for any signs of wear or damage, particularly to hoses, fittings and pumps.
Vandalism causing accidental release of coagulant, flocculant or sodium hydroxide.	The worksite is fenced using heras fencing with security clips. The siltbuster area will be fenced with heras fencing, double clipped with security clips. A pedestrian gate will be installed and this will be locked with a combination padlock at the end of the shift. Containers of chemicals will be stored in a spill containment cell.	Site security will check that the pedestrian gate has been locked at the end of the shift and will respond to the presence of unauthorised people within the construction area.
Use of permanent attenuation for storage of construction runoff	It is not considered best practice to utilise permanent attenuation for the attenuation of construction runoff. However in this instance, the permanent attenuation will be used to accommodate runoff from the area which will be drained as part of the permanent development. Runoff will have been processed through primary settlement ponds, which will remove all but the finest colloidal suspended solids. This will prevent the silting up of the SDS crate system.	A camera survey will be undertaken of the SDS Crate system following the completion of construction. If it is found that the crate system has become silted, a jet-vac system will be bought to site to de-silt the system. Runoff from this will be captured and treated.
Swale 2 being over capacity due to prolonged	If prolonged periods of high rainfall intensity occur, there is a risk that the Siltbuster system will not be able to accommodate the flow. This would result in water backing up into the Swale and rising through the clean	Water levels within the swale will be monitored weekly by lifting the manhole on

periods of heavy rain.	stone on the surface of the Swale. Prior to the construction of the swales, the areas were occupied by shallow ponds. During periods of wet weather, these ponds overflowed across the footpath into the Nant Eirin. In a worst-case scenario, this would be the case, if the Swale were to overflow.	the flow control chamber.

8. Environmental Emergency Preparedness and Response:

8.1 Emergency Contacts:

Incident Manager:	Adam McCarthy	- 07818065301
HSE Manager	Atila Balla	- 07725837705
Environmental Advisor:	Julian Gregory	- 07974386841
Natural Resources Wales:	0300 065 3000 (to be informed in the event of oil/chemical spill or fire).	
Emergency Services:	999 (Request service required)	

8.2 Environmental Incident:

Incident / Issue Type	Example
An inappropriately controlled emission to land, air or water (e.g. spillage, fumes, dust, vibration, noise, disposal) that has potential to cause environmental harm if not controlled properly.	Release of silt contaminated water to the Nant Eirin. Release of chemicals to the Nant Eirin. Dust emissions to neighbouring properties or onto agricultural land and areas of ecological significance.
A substantiated complaint from a third party affected by the project	Noise complaint from local resident. Statutory intervention from RCTCBC / NRW.
An event causing major quantifiable environmental harm	Damage to a site or archaeological significance. Injury or death to a European Protected Species.
A breach of an Environmental Permit that may lead to statutory intervention	Breach of discharge limits agreed with NRW. Breach of Planning Conditions
A breach of Environmental Legislation	Failure to ensure the Duty of Care for waste has been complied with.
Issue of a statutory enforcement notice, Local Authority, Natural Resources Wales (Works Notice)	NRW prosecution or warning letter. Local authority abatement notice.
An environmental emergency (i.e. an event on site that is not under control and requires assistance from external bodies to minimise potential harm to the environment)	Controlled release of hydrocarbons, cement, silt or chemicals i.e. leaks, RTA. Out of control fire. Uncontrolled works in agricultural restriction area.

8.3 Responsibilities

In all cases responsibility for immediate action lies with the person discovering the incident. They should take whatever actions they can, to immediately stop the source and contain the pollution.

In all cases the incident shall be immediately reported to the general foreman who shall report it immediately to the site manager who will act as the incident controller. The Incident Controller shall coordinate resources to put the containment and mitigation plan in place. The HSE Manager shall be informed immediately and shall assist in the supervision of the containment and mitigation plan as necessary.

The HSE Manager shall assist in post incident training, incident reporting/monitoring and documentation.

8.4 Specific Pollution Incidents.

Silt entering a watercourse:

If water quality at the two discharge points from site reduces, the following actions should be taken:

- Undertake an immediate investigation to identify the source of the pollution.
- Check the outfall from the Siltbuster system for any evidence of raised suspended solids and check the daily records.
- If it is identified that the source is runoff from the surface of the site. Construct bunds to divert silt contaminated runoff away from surface water discharges and into the attenuation ponds. If necessary, set up pumping sumps and pump runoff to the primary settling ponds.
- Reduce flow into the Siltbuster dosing / mixing tanks by closing the butterfly valve on the inlet. If this causes water levels within ponds to rise and potentially overtop, this is acceptable in the short term, as over topping water will flow through vegetation at several diffuse locations prior to entering the watercourse. This will remove the majority of the suspended solids from the water and will minimise silt loading at the site discharge.
- Bottled samples should be taken at the discharge points and retained for reference.
- Silt mitigation should then be reviewed and additional measures added as required i.e. additional siltfence to direct and filter runoff.
- If the source of the pollution cannot be identified, works should cease and silt contaminated water should be diverted or pumped back into Swale 2, until the source can be found.
- The incident must be reported as described in Section 8.6 – Incident Reporting.

Fuel or Oil entering a watercourse or drainage:

The response will depend on the amount of hydrocarbon spilt and the flow of the river. As a general rule the following steps should be taken.

- Stop release of fuel by removing the source or by using plastic sheeting and bunding.
- Deploy an oil absorbent boom across the watercourse to contain the spill.
- Place oil absorbent mats on the water surface to absorb the oil. N.B. once used these are to be stored and disposed of as special waste. Impermeable gloves and boots and disposable overalls are to be worn.
- The above items can be found in the oil spill kit, these are located with foremen, environmental coordinator, store man and in the environmental emergency area in main stores.
- Contaminated water can also be pumped from the watercourse into a sealed container for disposal by a registered waste handler.

- Natural Resources Wales to be contacted (0300 065 3000)

Fuel or Oil spillage on land:

- Stop release of fuel by removing the source or by using plastic sheeting and bunding.
- Excavate oil contaminated soil and place in an oil tight container. This must be disposed of by a specialist waste handler as hazardous waste.
- If spillage is onto a hard surface, all drains and gullies must be sealed immediately. Absorbent materials such as sand, sawdust, straw or oil absorbent granules/mats are to be placed over the contaminated area to soak up the spill. These should then be removed and stored and disposed of as special waste. Impermeable gloves and boots and disposable overalls are to be worn.
- The above items can be found in the oil spill kit, these are located with foremen, environmental coordinator, store man and in the environmental emergency area in main stores.
- Natural Resources Wales to be contacted (0300 065 3000)

Spillage of chemicals:

- Where possible remove source of pollution.
- Obtain as much information on the chemical spilt as possible to evaluate the potential harm it could cause to staff and the environment. MSDS Data Sheets will be held in the COSHH store and the COSHH file in the site office.
- If it can be ascertained that there is no significant health and safety risk the chemicals should be dealt with as oil, above.
- Contaminated soils should be excavated and placed into a plastic sheet lined bunded quarantine area.
- If a potential health and safety risk is identified the area should be evacuated and the emergency services contacted.
- Natural Resources Wales to be contacted (0300 065 3000)

8.5 Environmental Response Equipment

Spill kits are available from foremen's vehicles, Environmental Response Crews, site cabins, and the stores. Sandbags, straw bales, plastic sheeting, etc are available from the Environmental response area in the stores.

Environmental Response store inventory:

- Sandbags filled
- sandbags empty
- Straw bales
- Rolls of silt fence
- Rolls of Terram
- Plastic sheeting
- Wooden stakes
- Oil spill kits
- Pairs, plastic gloves

Also stored locally quantities of 20mm and 40mm clean stone.

8.6 Incident Reporting

All environmental incidents shall be reported to the Incident Controller immediately, they will then take the necessary action to ensure that the incident is dealt with and the responsible agencies (NRW, CADW, ENV Health, etc) are informed. The HSE Manager and Project Manager must be informed so that they can take any measures required. The incident shall then be reported on form MH/IR/001 Environmental Incident Report within 24 hours of the incident. The report shall include an explanation of the cause, the actions taken to mitigate the incident and proposals to prevent reoccurrence of the incident. Incidents shall be ranked in terms of their severity:

- Category A – Major incident i.e. release of polluting substance resulting in fish kill or serious environmental harm. Death of a protected species. Intervention of statutory authorities required. Incident to be notified to statutory authorities i.e. NRW (0300 065 3000).
- Category B – Spillage of 5l or more of polluting substance, silt contamination of a watercourse, extending past the site boundary. Incident to be notified to statutory authorities i.e. NRW (0300 065 3000).
- Category C – Minor incident – spillage of less than 5l of polluting substance, silt contamination of a watercourse which can be controlled by the time it reaches the site boundary. No requirement to notify NRW.

Assessment of incident severity is subjective and the discretion of the Incident Controller and ECO will be applied.

The Environmental Incident Report Form shall include the following information:

- Time, date and location of the incident
- The root causes of the incident
- Actions taken to remedy the incident
- Personnel involved
- Third parties and statutory bodies involved
- Procedures put in place to ensure there is no re-occurrence.

Appendix 1 – Drawing Number 248 – Pollution Prevention Plan

Appendix 2 – Coagulant, Flocculant and pH neutralisation MSDS Records.