23 December 2024

Permit Receipt Centre
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

Dear Sir/Madam,

HAFOD QUARRY: DISCHARGE PERMIT NORMAL VARTIATION APPLICATION

Please find enclosed, on behalf of Tarmac Limited (Tarmac), a normal variation application to vary discharge permit AN0337601 at Hafod Quarry. The proposed changes include:

- a new water management and treatment system to include additional surface water attenuation features and treatment measures to improve the water quality of the discharge;
- move the discharge point upstream; and
- consolidate discharge permit AN0337201 (authorising discharge in storm conditions) with discharge permit AN0235601 into a single permit.

To support the application, the following documents have been submitted:

- A letter of authorisation from Lisa Sumner at Tarmac (ref. TARMAC/HAFOD/10122024) authorising Envireau Water to sign forms relating to the discharge permit variation application;
- A letter of authorisation allowing Lisa Sumner to execute permit applications on behalf of Tarmac;
- A supporting technical report - RPT Permit Variation and H1 Assessment; and
- Completed online form C6.

The report and associated appendices address the requirements for the application set out by NRW in a letter dated 7 November 2024. The discharge passes Test 1 of the H1 Assessment and therefore qualifies for a normal variation. Tarmac has paid the associated fee of £4,846 (ref. WQTARMAC1312, remittance no. RITM0131794).

We look forward to receiving the varied permit in due course, but in the meantime if you would like to discuss any aspect of the application, please do not hesitate to contact us via email (chris@envireauwater.co.uk). Please ensure that the draft permit is issued to Envireau Water so that we can check it prior to issue.

Yours faithfully,

Chris Woodhouse
Principal Hydrogeologist

Windsor House, Windsor Place,
Shrewsbury, SY1 2BY

t 01332 871 882

e info@envireauwater.co.uk
w www.envireauwater.co.uk

Discharge Permit Variation and H1 Assessment

Prepared for Tarmac Trading Ltd

December 2024

CONFIDENTIAL

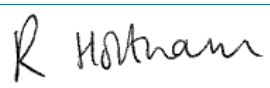
Shrewsbury Office
Windsor House
Windsor Place
Shrewsbury
SY1 2RN

Tel: 01332 871 882
E mail: info@envireauwater.co.uk
Web: www.envireauwater.co.uk

Quality Control Sheet

Title	Discharge Permit Variation And H1 Assessment
Client	Tarmac Trading Ltd
Issue Date	23/12/2024
Reference	3491102 Tarmac Hafod Quarry Discharge \ RPT Permit Variation and H1 Assessment

Authors

	Name	Signed
Prepared by	Mairi Teasdale (Hydrologist)	
Checked by	Richard Holtham	
Approved by	Chris Woodhouse	

Revision History

Revision	Details	Prepared by	Checked by	Approved by	Issue Date
REV01	Draft for client review	MT	CDW	CDW	11/12/2024
REV02	Final Report	MT	RH	CDW	23/12/2024

Contents

Figures

Tables

Appendices

1 INTRODUCTION

1.1 Background

Tarmac Trading Ltd (Tarmac) is applying to vary the Discharge Permit for the discharge of surface water ingress from Hafod Quarry (the Site) to the Nant Hafod-fach. The Site is located near Newbridge in Caerphilly County Borough. Figure 1 shows the Site location and surrounding area. Tarmac holds two discharge activity permits for the Site, these are:

- AN0337201 – authorising discharge of surface water from the Site during storm conditions; and
- AN0235601 – authorising discharge of surface water from the Site under all other weather conditions.

Tarmac is submitting a variation application to:

- introduce a new water management and treatment system to include additional surface water attenuation features and treatment measures to improve the water quality of the discharge through removal of suspended solids;
- move the discharge point further upstream; and
- Consolidate both of the existing discharge permits into a single permit.

On 30 October 2024, Tarmac met on-site with Kirsty Lewis and Elis Llŷr Nuttall of Natural Resources Wales (NRW) to discuss the proposed changes to the current discharge permit. Following this meeting, NRW provided a letter dated 7 November 2024 listing the information required to support the variation application. This letter is provided in Appendix A and Section 1.3 provides a summary of the requirements and where this information is provided in the report.

1.2 Scope of Work

This report has been prepared to support the discharge permit variation. The scope of work undertaken for this report includes the following:

- Review of the baseline conditions for the Site and surrounding area (Section 2);
- Details of the proposed water management, water treatment and discharge arrangement (Section 3);
- Site Environmental Management Plan (Section 4); and
- H1 Risk Assessment (Section 5).

1.3 NRW Letter and Responses

Table 1 summarises the requirements set out in NRW's letter dated 7 November 2024 (ref. PPN-01343), which is provided in Appendix A and the location of the relevant information/response in this report. A full H1 environmental risk assessment has not been carried out because there are no exceedances of the Environmental Quality Standards (EQS) in the discharge (see Section 5).

Table 1 NRW requirements and location within report

No.	NRW Comment	Location within Report	Location within Appendix/Figure
1	Maps showing the proposed new consent point, including the associated national grid reference (NGR).	Section 3.2.3	Figure 1
2	The proposed drawings and design of the treatment system, including the size of the lagoons (length, width, depth).	-	Appendix B
3	Calculations for the rate of discharge should be included, this being the volume and frequency of discharges from site.	Sections 3.2.4 and 3.2.5	
4	Map which shows the new discharge point .	-	Figure 1
	How new infrastructure will be maintained .	Section 4.1	
	How the treatment system will be maintained .	Section 4.1	Appendix F and Appendix G
	How waste from the treatment process (Siltbuster) will be managed and disposed of.	Section 4.2	
	Details on the safe storage of chemicals/materials.	Section 4.3	
	How and what training will be provided for site staff to ensure operational competency.	Section 4.4	
	An incident response plan in the event of system failure. NRW's incident reporting number (03000 65 3000) should be included in this section and used to inform us of any incidents on site.	Section 4.5	
5	An audit log/checklist of areas to be regularly checked which includes timestamped photographs. This log will need to be in a physical paper format and must include a date, time and signature section for the operator conducting the checks.	Section 4.6	Appendix H
6	The safety data/COSHH sheets for both the flocculant and coagulant proposed for use including the analysis as provided in the meeting.	-	Appendix E
7	Accredited sample results from the watercourse at the point of discharge and downstream.	Section 5	Appendix I
8	A spreadsheet showing the sampling parameters, date, limit of detection and Environmental Quality Standards (EQS).		Table 8 and Appendix I

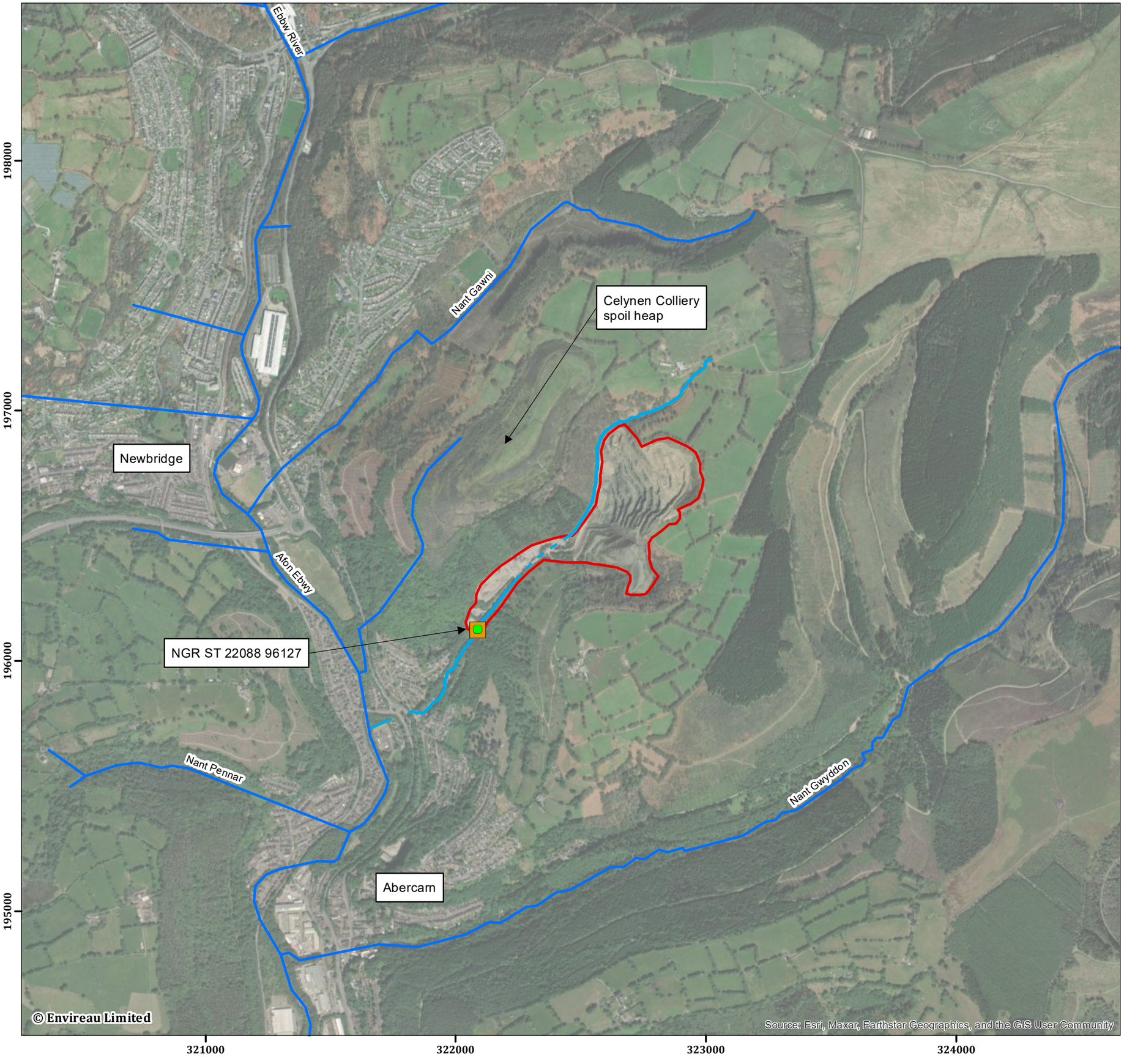
1.4 Data Sources

The information and assessments in this report are based on:

- Previous report for the Site by GWP Consultants (GWP Consultants, 2024);
- Data from Siltbuster Ltd including treatment design requirements;
- British Geological Survey (BGS) mapping;
- Ordnance Survey mapping; and
- Data from NRW including designated sites, rainfall, LiDAR data, and discharge activity permits.

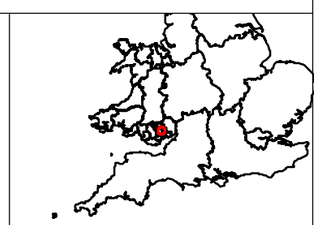
Figure 1: Site Setting

Hafod Quarry, Wales



- Site Boundary
- Watercourse
- Nant Hafod fach
- Nant Hafod fach Culvert
- Proposed Discharge Point
- Proposed Sampling Location

Notes:



0 150 300 450 600 Meters

Scale: 1:15,000 at A3

23 December 2024

NGR: 322,460 E / 196,567 N

Project No. 3491102

Client: Tarmac

Drawn by: MT

Ref: FIG - Site Setting

envireau WATER

2 BASELINE CONDITIONS

2.1 Site Location and Setting

The Site lies within a small valley (Nant Hafod-fach), 750 m east of Newbridge, immediately north of Abercarn and 10.5 km northwest of Newport in South Wales. The Site is an active sandstone quarry and is surrounded by largely agricultural and forestry land with major settlements in the valleys. The Site is in an area that was historically worked for coal.

2.2 Topography

The quarry void is cut into the steep northeastern side of the Nant Hafod-fach valley. The valley is deep and steep sided, with ground levels varying from 130 m AOD at the base of the valley near to the Site entrance to 335 m AOD in the north-eastern part of the Site (see Figure 2). To the west of the Site the land rises steeply to a maximum elevation of around 330 m AOD at the summit of the Celynen Colliery spoil heap around 320 m west of the Site. To the east of the Site the land rises to reach a maximum elevation of 350 m AOD approximately 450 m southeast. Slopes surrounding the Site typically differ between 1 in 1.5 and 1 in 3 (v:h) (although the gradient flattens out above 300 m AOD).

The quarry benches currently range between 195 and 340 m AOD. The main quarry tip (Main Tip) is located on the south side of the quarry void, partially infilling the southern side of the void.

Regionally, ground levels fall to the Afon Ebwy, which is at around 100 m AOD around 450 m west of the Site, and rise to a peak of 472 m AOD on Mynydd Maen 3.3 km northeast of the Site.

2.3 Hydrology

2.3.1 Rainfall

The nearest NRW rain gauge to the Site is at Maes Y Rhiw, approximately 5 km southeast of the Site. The mean annual rainfall from 2005 – 2024 is 1,390 mm. Mean monthly rainfall is lowest (< 90 mm) from April – July and highest (> 160 mm) from October to January. The Site has a Standard Annual Average Rainfall (SAAR) of 1,424 mm, which is similar to that at the NRW rain gauge (CEH, 2024).

2.3.2 Watercourse and Waterbodies

Figure 1 shows the surrounding watercourses. Based on OS mapping, the Nant Hafod-fach is sourced from a spring line located on higher ground (at around 320 m AOD) approximately 325 m north of the Site and flows south westwards along the north western boundary of the Site for approximately 500 m. At this point, it is culverted beneath the Site for approximately 275 m (Figure 2) where it emerges east of the Site access road into a manmade leat (i.e., straightened channel). Approximately 450 m downstream of the Site the Nant Hafod-fach confluences with the Afon Ebwy which subsequently discharges to the River Usk 15 km southeast of the Site.

Cut-off benches are located along the eastern side of Celynen Colliery spoil heap that capture and direct surface water runoff away from the Site and down the south western edge of the hillside before draining into the Afon Ebwy. A small waterbody (Pwllgwinau) is located on agricultural land 340 m east and upgradient of the Site.

2.4 Geology

The underlying bedrock geology at the Site is sandstone of the Hughes Member, which forms part of the Pennant Sandstone Formation (part of the Warwickshire Group) . No superficial deposits have been mapped at the Site.

2.5 Hydrogeology

The Pennant Measures Formation includes several mudstone layers that create perched water tables and spring lines, one of which feeds the Nant Hafod-fach. Coal mining during the 19th and 20th centuries significantly disrupted these mudstone aquicludes, causing most to become leaky. Groundwater in the bedrock is recharged by rainfall and discharges as baseflow to surrounding watercourses, as represented by the relatively high baseflow index in the Nant Hafod-fach (Table 2).

2.6 WFD Status

Table 3 summarises the Water Framework Directive (WFD) classification assigned by NRW to the Afon Ebwy. The Afon Ebwy is designated as Moderate overall. The reasons for not achieving Good are related to surface water abstraction and fish migration. There is no WFD classification for the Nant Hafod-fach as the catchment is too small to qualify.

Table 2 WFD Statuses

Waterbody	Overall Status	Ecology Status	Hydrological Regime	Chemical status
Ebbw R – conf Ebbw Fach R to Maes-glas	Moderate	Moderate	Does not support good	Moderate

2.7 Designated Sites

There are no designated sites located within the vicinity of the Site. The closest designated site is Ty'r Hen Forwyn Site of Special Scientific Interest (SSSI) located approximately 3.3 km northeast. Ty'r Hen Forwyn SSSI is designated for its species-rich neutral grassland. This SSSI is upstream of the Site.

2.8 Current Discharge Permits

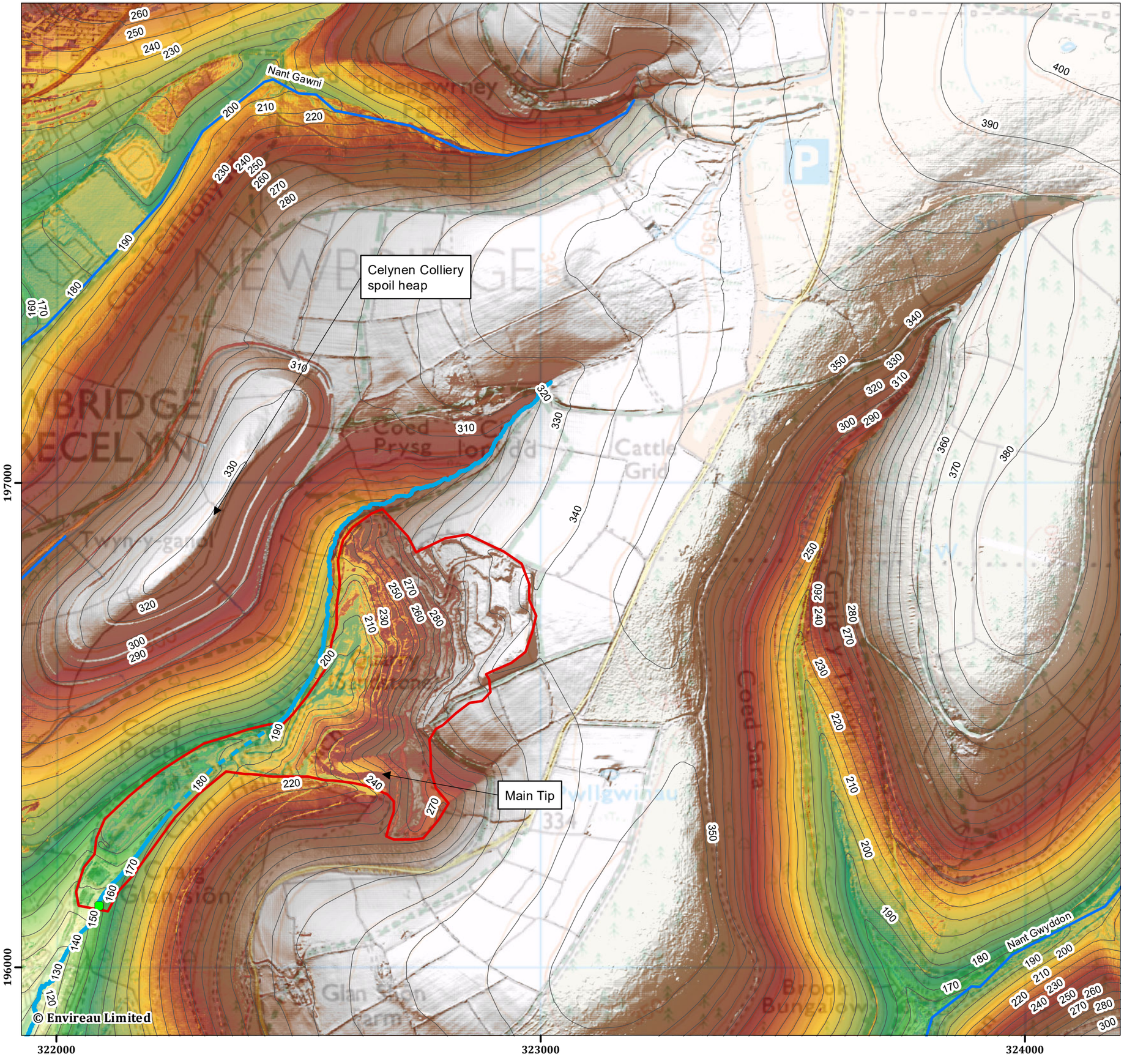
The Site has two discharge permits, one for normal conditions and one for storm conditions, defined as when flows in the Nant Hafod fach are equal to or above 0.53 m^3/s.

Table 3 Site Discharge Permits

Licence ID	Purpose	Permitted Rate (m^3/day)	Water Quality limits	Application
AN0235601	Trade effluent comprising of site drainage	Rainfall Dependent (Flows under 0.53 m^3/s)	Suspended solids: 80 mg/l pH: 6-9 Mineral Oil: 5 mg/l	When receiving flows are <0.53 m^3/s)
AN0337201	Site drainage under storm conditions	Rainfall Dependent (Flows over 0.53 m^3/s)	No limits	When receiving flows are > 0.53 m^3/s)

Figure 2: Topography and Catchments

Hafod Quarry, Wales



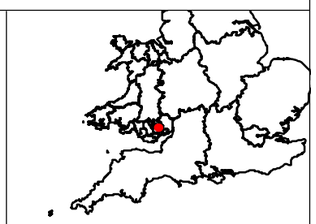
- Site Boundary
- Watercourse
- Nant Hafod fach
- Nant Hafod fach Culvert
- contours
- Discharge Point

Ground Elevation (mAOD)

High : 453.95

Low : 83.7803

Notes:



0 90 180 270 360 Meters

Scale: 1:7,750 at A3

23 December 2024

NGR: 323,063 E / 196,925 N

Project No.	3491102
Client:	Tarmac
Drawn by:	MT
Ref:	FIG - Topography

envireau WATER

3 PROPOSED WATER MANAGEMENT, TREATMENT, AND DISCHARGE ARRANGEMENTS

3.1 Overview

This section sets out the proposed water management strategy at the Site based on the design by GWP Consultants (2024). The total catchment area draining to the discharge point is 21.6 ha. Section 3.2 sets out how runoff and Site drainage will be managed, whilst Section 3.3 covers the designed treatment measures. Figure 3 shows the proposed water management in plan view, and Figure 4 shows the water management as a schematic. Drawings of the proposed attenuation lagoons are provided in Appendix B.

3.2 Water Management Strategy

3.2.1 Quarry Void

All water entering the quarry void (principally rainfall and runoff) drains to the Quarry Sump (Settlement Pond 1 on Figure 3 and Figure 4). From here, it flows under gravity via a french drain to the attenuation pond (Settlement Pond 2). The quarry sump and attenuation pond combined provide up to 11,000 m^3 of water storage which is sufficient for a 1 in 100 year 6 hour storm event (GWP Consultants, 2024). The attenuation pond also receives runoff from the south side of the Main Tip, which will be conveyed via a cut-off drain. Water will be pumped from the attenuation pond via two separate pumped systems, diverting water through two sets of MT30 Chemical Pre-Treatment systems and HB50R Operated Settlement Units designed by Siltbuster Ltd (Siltbuster). These are herein referred to as the MT30 and HB50R treatment system. Once water has passed through the MT30 and HB50R it will enter a 150 mm pipe to prevent mixing with untreated runoff. This will become a 250 mm diameter pipe where it is joined by treated water from the plant and stockyard area. From here, it will be conveyed along the pipe to the discharge point.

3.2.2 Plant and Stockyard Area

Runoff from the plant and stockyard area, which covers around 3.6 ha, will be collected in open ditches running along the eastern and south-western perimeters of the area, preventing untreated runoff from entering Nant Hafod-fach. These open ditches will be covered with cattle grids where vehicular access is required. Runoff from the northern area of the plant yard will flow through a grit tank to remove coarse sediment before passing to the Plant Area attenuation pond, which will have a capacity of 1,700 m^2. Water is pumped from this attenuation pond into a MT30 and HB50R treatment system. Flows will then join the main pipe containing the treated water from the quarry void and south side of the Main Tip and continue to the discharge point.

3.2.3 Discharge Location

Tarmac is applying to vary the discharge and sampling point to be 150 m upstream of the current discharge point so that it is within an area of Tarmac's control. The proposed new discharge point is at NGR ST 22088 96127.

3.2.4 Discharge Rate and Frequency

Under conditions when flows in the Nant Hafod-fach are < 0.53 m^3/s (i.e., storm conditions), the maximum discharge rate will be the maximum designed capacity of the MT30 and HB50R treatment system. Each of the three MT30 and HB50R treatment systems has a maximum treatment capacity of 50 m^3/hr. The maximum discharge is therefore 3,600 m^3/day, or 0.0417 m^3/s. This is more than the Qbar, this shows that the treatment system is able to treat runoff volumes of up to 40 m^3/s more than Qbar. See Appendix C for Greenfield Runoff Rated calculated by GWP (GWP Consultants, 2024).

The discharge rate will be entirely dependent on incident rainfall. Given the consistency of rainfall at the Site (Section 2.3.1), the discharge will likely be active throughout the year being higher during the autumn and winter months when rainfall is higher and lower during spring and summer.

3.2.5 Storm Conditions

Tarmac proposes no changes to the conditions stated on AN0337201. On the consolidated permit, it is proposed that these would apply under storm conditions. During storm conditions, when the flow rate in the Nant Hafod-fach is above 0.53 m^3/s, discharge from the Site will occur at the required rate to prevent flooding within the Site. This is the flow rate in a 1 in 100 year storm event. As per the current arrangement, there will be no specific limits on the quality in this event.

3.3 Treatment Measures

3.3.1 Outline

The combined area of the sump and attenuation pond is insufficient to facilitate the settlement of suspended solids and there is insufficient area on-site to accommodate larger ponds. Therefore, further treatment measures are required and these are set out below. This system has been designed by Siltbuster based on site-specific testing (Siltbuster, 2023).

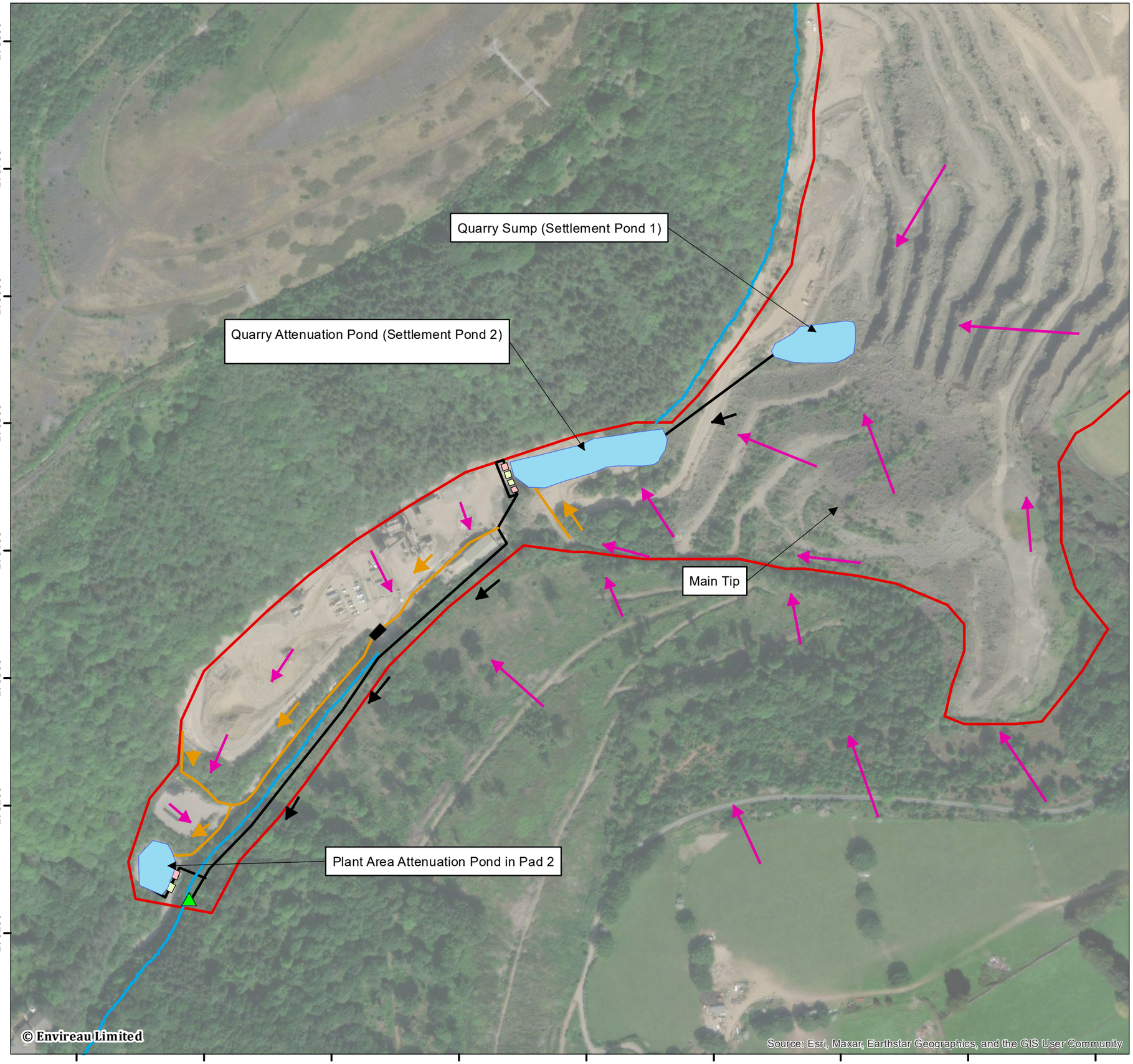
3.3.2 Treatment Processes

An inlet electromagnetic flow meter will record the volume of inflowing water and allow flow proportional dosing by coagulant (polyaluminium chloride) and polymer (Aquatreat AQ2084), the Material Safety Sheets are provided in Appendix E. The use of an automatic flow proportional dosing system (of coagulant and flocculant) prevents overdosing. The system has been designed to ensure the reagents fully mix with the water. Pre-conditioned water then passes through a backflow Lamella Settlement Tank and settling solids are retained. These tanks will have integrated de-sludge pumps. This will allow Tarmac to set the frequency and duration of de-sludge periods to suit site requirements.

The treatment system has been designed through two rounds of testing. The results of the testing show that the above specified treatment system removes 99% of the suspended solids from the sample after 12 minutes when using both a coagulant (polyaluminium chloride) and a polymer (Aquatreat). Full results are provided in Appendix D.

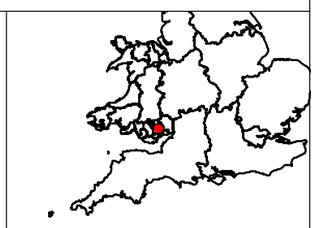
Figure 3: Proposed Water Management

Hafod Quarry, Wales



- Site Boundary
- Grit Tank
- HB50R
- MT30
- Settlement Pond
- Nant Hafod fach
- Pipe
- Pipe Flow Direction
- Open Channel
- Open Channel Flow Direction
- Overland Flow Direction
- Proposed Discharge Location

Notes:



0 40 80 120 160 Meters

Scale: 1:3,000 at A3

23 December 2024

NGR: 322,387 E / 196,417 N

Project No. 3491102

Client: Tarmac

Drawn by: MT

Ref: FIG - Proposed Water Managementm....

envireau WATER

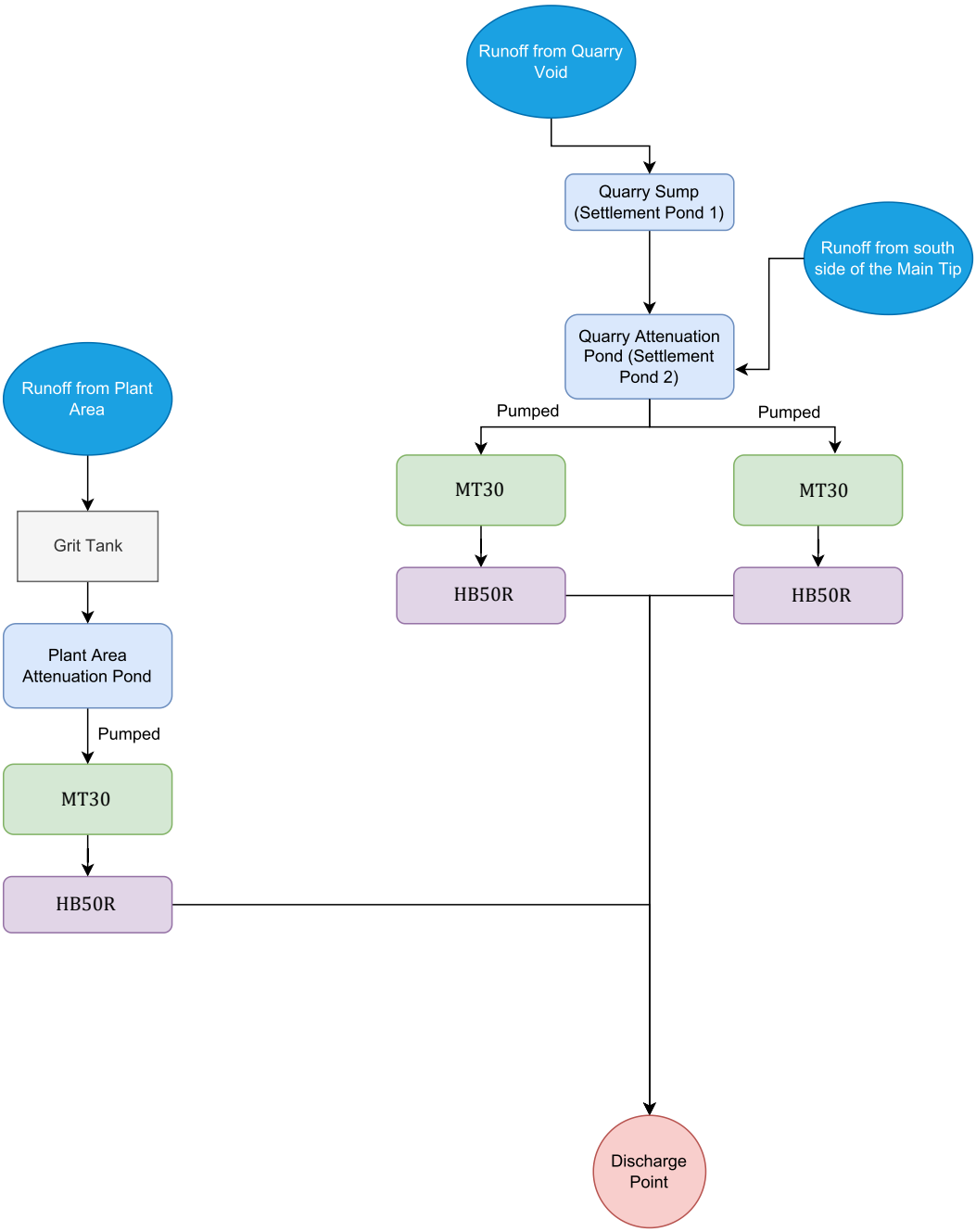


Figure 4 :Proposed Water Management

Date: 10 December 2024
Project No. 3491102
Client: Tarmac
Ref: Flow Diagram
Drawn by: MT

4 SITE MANAGEMENT PLAN

4.1 Maintenance Schedule

4.1.1 Outline

This section outlines the maintenance and management schedules for the Site water management plan. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual (C753) (Woods Ballard, et al., 2015).

There are three categories of maintenance activities referred to in this plan:

- **Regular maintenance** – tasks required on a weekly or monthly basis, or as frequently as required.
- **Occasional maintenance** – tasks required periodically, typically at intervals of three months or more.
- **Remedial maintenance** – tasks not required on a regular basis but are done when necessary.

This section is intended to give an overview of the operation and maintenance for the drainage features included within the surface water management plan.

Maintenance schedules for the proposed components are provided in Table 5 to Table 7. These schedules will be reassessed at regular intervals to determine if any additional maintenance is required to preserve the performance and condition of the drainage system.

In addition to the maintenance schedules below, Tarmac requires site managers to inspect drainage systems after storm events, particularly around soil bunds, and material storage areas to ensure that the drainage system is functioning as designed.

4.1.2 Sumps/ Attenuation Ponds

A schedule of maintenance activities for the sump and attenuation ponds is set out in Table 5. Pumps will be maintained in accordance with manufacturer specifications. The sump and attenuation ponds will be designed to ensure that a long reach excavator can access the base on the lagoons to remove settled silt.

Table 4 Sump/ Attenuation Pond Maintenance Schedule

Schedule	Required action	Frequency
Regular maintenance and monitoring	Visual inspection of water clarity	Daily
	Remove litter and debris	Monthly or as required
	Inspect banksides, structures, pipework for evidence of physical damage	Monthly
	Inspect inlets and surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly and following storm events
	Remove any settled silt and sediment from inlets and reinstate design levels	Every 2 months and following storm events. The frequency of silt/sediment removal will

Schedule	Required action	Frequency
		be informed by regular inspections and adjusted accordingly.
	Removal of settled silt	Annually or as required
Remedial actions	Repair erosion or other damage	As required

4.1.3 Open Channels

A schedule of maintenance activities for the open drainage channels is included in Table 6.

Table 5 Open Channel Maintenance Schedule

Maintenance schedule	Required action	Frequency
Regular maintenance and monitoring	Visual inspection of water clarity	Daily
	Remove litter and debris	Monthly or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets, and culverts for blockages and clear if required	Monthly and after flood events
	Inspect base of channel for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours	Monthly or when required
	Inspect vegetation coverage	Monthly
	Inspect banksides for evidence of physical damage	Monthly
	Inspect inlets, outlets, and channel surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly
	Removal of settled silt	Annually or as required
Remedial actions	Repair erosion or other damage	As required

4.1.4 Pipes

A schedule of maintenance activities for pipes is included in Table 7.

Table 6 Pipes Maintenance Schedule

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc	Monthly, or as required
	Inspect for evidence of poor operation	Monthly (during the first year), then half yearly
Occasional maintenance	High pressure water jet removal of silt build-up and avoid blockages, particularly at bends or changes in direction	Six monthly, or as required
Remedial actions	Clear pipework of blockages	As required
	Replace any damaged or failed pipes or manholes	As required

4.1.5 Treatment Maintenance Schedule

Maintenance schedules for the MT30 and HB50R treatment systems are provided in Appendix F and Appendix G, respectively. Tarmac will carry out maintenance in accordance with Siltbuster's specifications.

4.2 Silt Disposal Measures

Settled silt from the treatment process will be removed and stored within a constructed area within the quarry void.

4.3 Safe Storage of Chemicals and Materials

Best practice will be adopted throughout the operation and restoration of the Site. Relevant guidance will be followed, in particular the Guidance for Pollution Prevention (GPP) documents (NetRegs, 2024).

Tarmac operates an Environmental Management System (EMS) accredited to ISO 14001. The EMS dictates that standard best practice will be followed to minimise the impact of refuelling and the storage of fuel and oil etc. on the environment in accordance with the GPPs (GPP 2: Above ground oil storage and GPP 8: Safe storage and disposal of used oils). This includes the following measures:

- Facilities for the storage of fuels or chemicals are sited on an impervious base and surrounded by impervious bund walls.
- The volume of the bunded compound is greater than the tank capacity (at least 110% of the maximum tank capacity).
- Filling points, vents, gauges, and sight glasses are located within the bund walls.

- The bund drainage system will be sealed with no discharge to any watercourse, land, or underground strata permitted. Associated pipework is located above ground and protected so as to prevent accidental damage.
- All filling points and tank overflow pipe outlets discharge downwards into the bund.
- Storage of loose drums of fuel on-Site is not permitted.

An emergency spill kit (containing absorbent materials and spill socks and pillows, storage receptable/bin bags, ties, and hazard tape) is maintained in good order and stored in an accessible location in the unlikely event of a spillage of fuel or other chemical within the Site.

All plant operators routinely check mobile and fixed plant for leaks as a minimum at the start and end of each shift. All vehicles and plant at the Site are maintained and serviced in accordance with the manufacturer's recommendations. All contractor vehicles are subject to similar procedures.

All chemicals including flocculant and coagulant will be stored in accordance with the manufacturer's guidance (Appendix D) and Tarmac's EMS this will include:

- Storage isolated from sources of heat and ignition and will not be allowed to freeze or mix with other chemicals.
- Storage of poly-aluminium chloride (PAC 10%) in plastic containers or a plastic-lined steel drum.

4.4 Staff Training

All Tarmac staff will be aware of the potential risks of water contamination and will be trained in best practice and Tarmac's EMS. Site staff will ensure that all contractors are aware of the EMS and relevant procedures. Siltbuster will run official training at their own facility to train and certify at least 50% of Tarmac staff employed at the Site.

4.5 Incident Response Plan

All incidents associated with Site activities including environmental incidents and non-conformance with the EMS, will be reported and investigated. The following procedure will be followed in the unlikely event of an incident:

- related works will cease;
- the Quarry Manager will be contacted;
- the nature of the incident will be assessed;
- if the incident is controllable by staff on Site, remedial action will be taken immediately in accordance with the EMS;
- if the incident cannot be controlled by the staff on Site, emergency assistance will be sought;
- NRW's incident reporting number (03000 65 3000) will be contacted if the event could impact the water environment, atmosphere, and/or protected species;
- Tarmac will instigate an investigation into the occurrence of the incident;
- the findings will be sent to the NRW if necessary; and
- an action plan will be prepared to determine why the incident occurred and whether any modifications to working practices are required to prevent a recurrence and all workers will be notified.

4.6 Audit Log/Checklist

Regular inspections will be carried out by Tarmac on all works being carried out at the Site including those related to the discharge. The audits will include timestamped photographs and will be completed in a standard physical paper format that includes the date, time and person carrying out the checks. All audit findings will be recorded and disseminated to relevant parties as appropriate. An example of the audit log can be found in Appendix H.

4.7 Monitoring and Sampling

Tarmac will maintain safe access to the outlet to allow samples of the discharge water to be collected. Tarmac will monitor the following:

- Discharge rate;
- Suspended solids;
- pH; and
- TPH concentrations.

Flow monitoring equipment will be installed in an appropriate location along the Nant Hafod-fach to monitor when storm conditions have been reached.

5 H1 RISK ASSESSMENT

5.1 Overview

An H1 risk assessment has been undertaken in accordance with the Environment Agency's surface water pollution risk assessment guidance (Environment Agency, 2022), which has been adopted by NRW (Natural Resources Wales, 2023). Runoff from the Site is discharged to the Nant Hafod-fach, which is classified as freshwater. The water quality sampling results show that Test 1 of the H1 assessment is passed and, therefore, there is no requirement for a full H1 assessment. Full details of the water quality sampling results and H1 parameterisation are set out below.

5.2 Water Quality Sampling

5.2.1 Discharge Water Quality

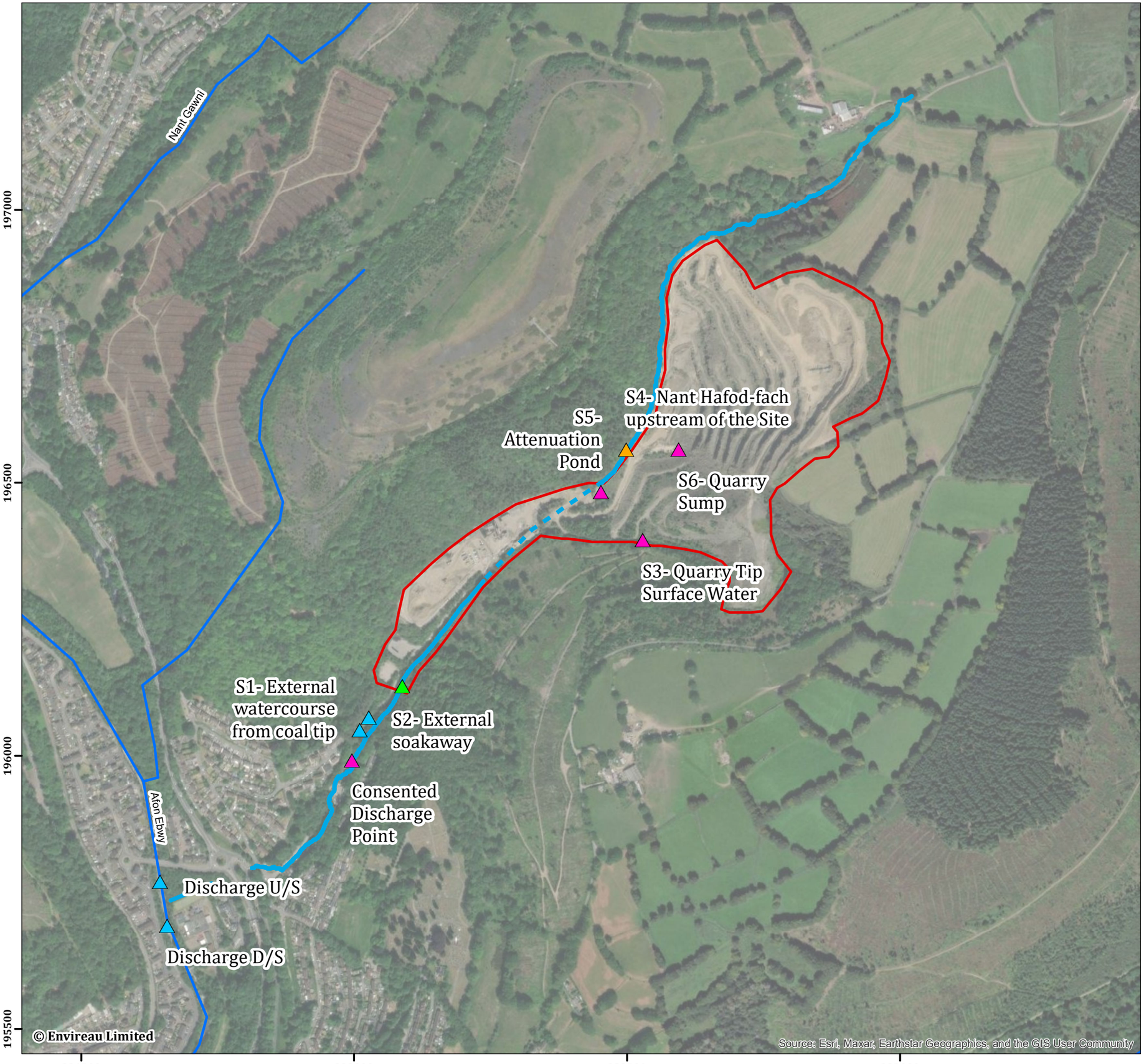
The discharged water will be treated Site runoff. The quality of the water within the discharge has been assessed using water samples collected on 25 November 2024 from three locations within the quarry runoff catchment (S3, S5 and S6) as well as from the point of discharge, as shown on Figure 5. These samples are representative of the current discharge quality; however, the proposed treatment will reduce suspended solids concentrations within the discharge.

5.2.2 Background Water Quality

Background water quality has been assessed using one set of samples taken from upstream of the Site also on 25 November 2024, S4 (Figure 5). A further four water quality samples were collected from two the Nant Hafod-fach and two from the Afon Ebwy, shown in Figure 5.

Figure 5: Sampling Locations

Hafod Quarry, Wales



Site Boundary

Nant Hafod fach

Nant Hafod fach Culvert

Watercourse

Proposed Discharge Point

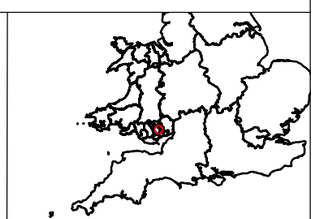
Sampling Locations

Background Water Quality

Site Runoff and Discharge

External Sources

Notes:



0 80 160 240 320 Meters

Scale: 1:7,000 at A3

20 December 2024

NGR: 322,416 E / 196,416 N

Project No.	3491102
Client:	Tarmac
Drawn by:	MT
Ref:	FIG - Sampling Locations

5.3 Test 1

The water quality sample results are shown in Table 8, showing the results from the discharge (S3, S4, S5, S6 and Discharge Point)(Figure 5), screened against the EQS for metals, hazardous substances and pH. The full results displayed in Appendix I.

The pH of the discharge is neutral; which is similar to all sampling locations including the background sample in the Nant Hafod-fach. Runoff at the Site is categorised as hard water, suggesting that there is a groundwater component to the discharge.

All nine sample locations have been compared against the EQS values. The only parameters that are above the EQS were aldrin, isodrin and P,P'-DDT within locations outwith the Site boundary (S1 and Discharge D/S). These samples contain runoff from the coal tip which is not related to Site operations and this water is disconnected from the Site.

Table 8 shows the comparison of the discharge water quality results against the EQS. All sample results used for the assessment (S3, S4, S5,S6 and Discharge Point) are below the EQS. Therefore, the discharge passes Test 1 of the H1 assessment and Test 2 is not required.

Table 7 Water Chemistry Results

Parameter	Units	LOD	EQS	Maximum Concentration in Site Runoff and Discharge (S3, S5, S6 and Discharge Point)
pH	-		6-9 MAC	7.6
Biological Oxygen Demand	mg/l	1		1
Total Suspended Solids (TSS)	mg/l	5		307
Hardness	mg/l			138
Cadmium as Cd (Dissolved)	mg/l	0.00002	0.08	0.00002
Iron as Fe (Dissolved)	mg/l	0.01	1	<0.01
Total Sulphur as SO4 (Dissolved)	mg/l	3	400,000	128
Nickel as Ni (Dissolved)	mg/l	0.001	4	<0.001
Lead as Pb (Dissolved)	mg/l	0.0002	1.2	<0.0002
Zinc as Zn (Dissolved)	mg/l	0.002	10.9	0.005

Parameter	Units	LOD	EQS	Maximum Concentration in Site Runoff and Discharge (S3, S5, S6 and Discharge Point)
Total Chromium as Cr (Dissolved)	mg/l	0.001	4.7	<0.001
Copper	mg/l	0.001	1	<0.001
Lead	mg/l	0.0002	1.2	<0.0002
Mercury	mg/l	0.00003	0.07 MAC	<0.00003
Aldrin	µg/l	0.01	0.01	<0.01
Isodrin	µg/l	0.01	0.01	<0.01
p,p'-DDT	µg/l	0.01	0.01	<0.01

5.4 Impact Assessment

The proposed treatment will ensure that the discharge water quality meets the permitted discharge quality limits. There will be no release of aluminium or iron into the discharge due to dosing being controlled within the HB50R treatment system.

6 SUMMARY

Tarmac is submitting a normal variation application to vary its existing discharge permits at Hafod Quarry to:

- introduce a new water management and treatment system to include additional surface water attenuation features and treatment measures improve the water quality of the discharge through removal of suspended solids;
- move the discharge point further upstream; and
- consolidate both of the existing discharge permits into a single permit.

An H1 risk assessment has been undertaken for the discharge from Hafod Quarry. A comparison between site runoff and the EQS shows that concentrations of all parameters are below the EQS where there is a limit. With the implementation of the proposed water management strategy, suspended solids concentrations will be maintained below the permitted limit of 80 mg/l during non-storm conditions. The proposed water management strategy will provide betterment due to the additional attenuation, and due to the treatment provided by the MT30 and HB50R units.

REFERENCES

CEH. (2024, June). *Flood Estimation Handbook Web Service*. Retrieved from https://fehweb.ceh.ac.uk/

Environment Agency. (2022). *Guidance: Surface water pollution risk assessment for your environmental permit*. Retrieved from https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit

GWP Consultants. (2024). *Hafod Quarry Surface Water Management Scheme.*

Natural Resources Wales. (2023, September). *H1 Software tool and guidance*. Retrieved from Horizontal Guidance: https://naturalresources.wales/permits-and-permissions/environmental-permits/horizontal-guidance/?lang=en

NetRegs. (2024). *Guidance for Pollution Prevention (GPP) documents*. Retrieved from https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/

Siltbuster. (2023). *HB50R- Lamella Clarifier Operation and Maintenance Manual.*

Woods Ballard, B., Wilson, S., Udale-Clarke, H., Illman, S., Scott, T., Ashley, R., & Kellagher, R. (2015). *The SuDS Manual (C753).* CIRIA.

APPENDICES

Appendix A NRW Letter

Your Ref: PPN-01343

Tarmac Trading Limited
Ground Floor T3 Trinity Park,
Bickenhill Lane,
Birmingham,
United Kingdom,
B37 7ES

07/11/2024

Dear Sirs,

Improvement works at Hafod Quarry, Abercarn

Thank you for inviting Kirsty Lewis and I to the meeting at Hafod Quarry on the 30/10/2024. Please see below a list of actions/guidance as discussed in the meeting.

An application to vary your existing environmental permit EPR- AN0337201 will need to be submitted to reflect the proposed works which includes a new treatment system using flocculant and coagulant, a new discharge point and discharge frequency/rate. This can be done by filling out the C6 application form online via Natural Resources Wales / Change (vary) an existing permit for a discharge of trade or mixed effluent. Charges for the application can be found via the above link.

The variation should be classed as a “normal variation.” However, if the sampling shows presence of any hazardous material, then it will be deemed as a “substantial variation.”

To support the variation application, we advise that you ensure the following is included:

1) Maps showing the proposed new consent point, including the associated national grid reference (NGR).

2) The proposed drawings and design of the treatment system, including the size of the lagoons (length, width, depth).

3) Calculations for the rate of discharge should be included, this being the volume and frequency of discharges from site.

4) An updated site management plan, which includes:

   - Map which shows the new discharge point
   - How new infrastructure will be maintained
   - How the treatment system will be maintained
   - How waste from the treatment process (Siltbuster) will be managed and disposed of
   - Details on the safe storage of chemicals/materials

- How and what training will be provided for site staff to ensure operational competency.

- An incident response plan in the event of system failure. NRW's incident reporting number (03000 65 3000) should be included in this section and used to inform us of any incidents on site.

5) An audit log/checklist of areas to be regularly checked which includes timestamped photographs. This log will need to be in a physical paper format and must include a date, time and signature section for the operator conducting the checks.

6) The safety data/COSHH sheets for both the flocculant and coagulant proposed for use including the analysis as provided in the meeting.

7) Accredited sample results from the watercourse at the point of discharge and downstream which includes the following parameters:

   - Biological Oxygen Demand (BOD)
   - Metals
   - Total Suspended Solids (TSS)
   - pH
   - Hazardous substances

Guidance on the key hazardous substances to check against and the processes to follow can be found via the following link: Surface water pollution risk assessment for your environmental permit - GOV.UK.

8) Once sampling has been undertaken, a spreadsheet needs to be formulated showing the sampling parameters, date, limit of detection and Environmental Quality Standards (EQS).

9) In the event of any exceedances, additional samples will be required and a full H1 environmental risk assessment if the exceedances persist. Guidance on how to undertake a H1 assessment can be found using the following link: H1 Tool | ADMLC.

If you have any questions on the above, please feel free to contact me.

Yours sincerely,

Elis Llŷr Nuttall

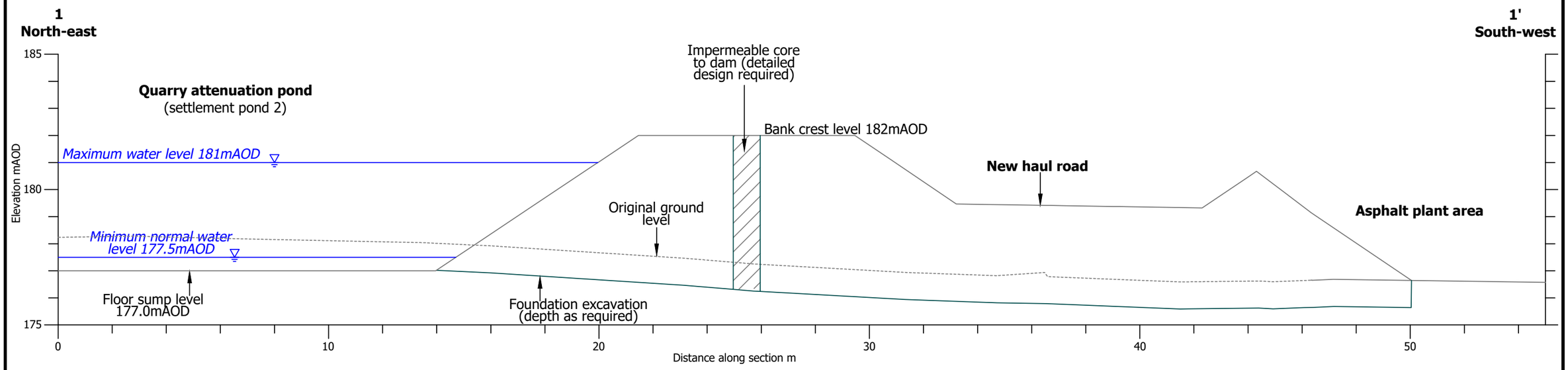
Swyddog Amgylchedd / **Environment Officer**
Tîm Amgylchedd Casnewydd, Caerffili a Blaeneau Gwent / **Newport, Caerphilly and Blaenau Gwent Environment Team**
Rhif ffôn / **Phone number**: 0300 065 4651
Rhif symudol / **Mobile number**: 07813 396378
E-bost / **E-mail:** elis.nuttall@cyfoethnaturiolcymru.gov.uk

Plas yr Afon, Parc Busnes Llaneirwg, Llaneirwg, Caerdydd, CF3 0EY / Rivers House, St Mellons Business Park, St Mellons, Cardiff, CF3 0EY

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

Appendix B Proposed Attenuation Lagoon Drawings



NOTES

- Ground surface derived from the Defra LiDAR DTM 1m 2020.
- See Drawing No. HAFODSWM2408-4 for location of cross section.

Version	Revision and compilation notes	Date
a	Issued	12.09.2024
b	Issued	03.10.2024

Client
Tarmac Trading Limited.

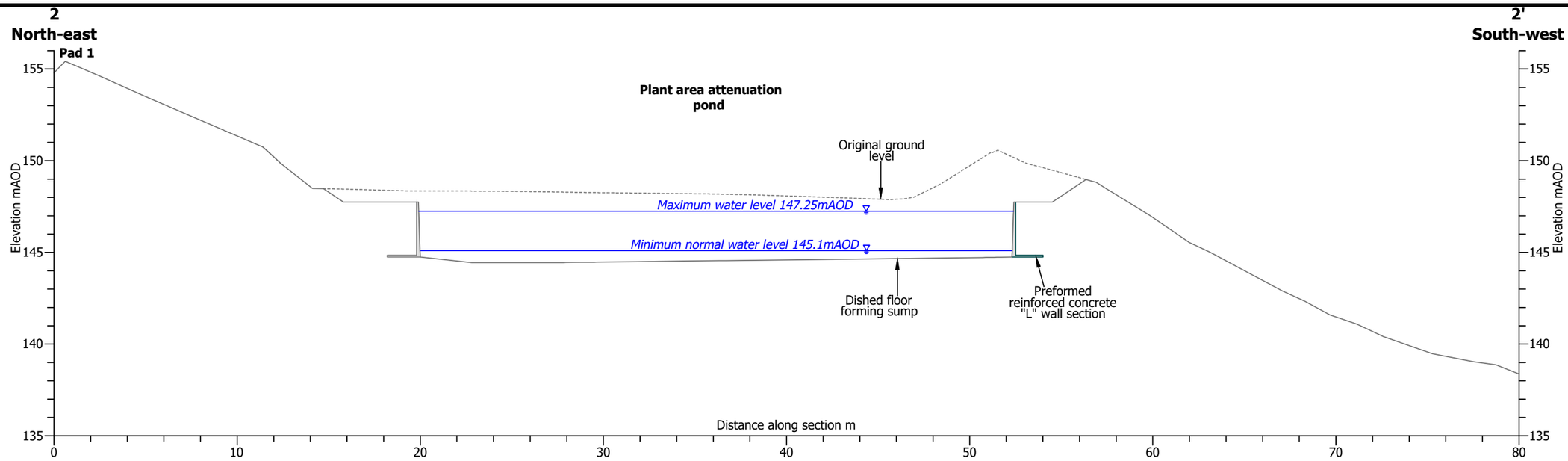
Project
Hafod Quarry, surface water management scheme

Cross section 1-1' through Quarry attenuation pond bank

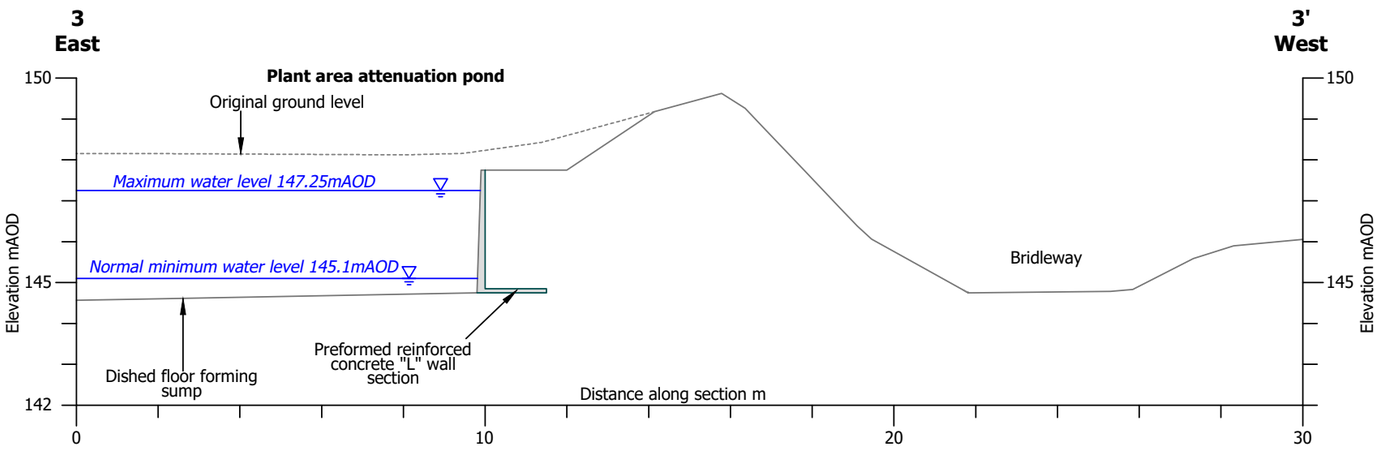
GWP consultants
Upton House
Market Street, Charlbury
Oxfordshire OX7 3PJ
United Kingdom
tel +44 (0)1608 810374
fax +44 (0)1608 810093
e-mail info@gwp.uk.com
web www.gwp.uk.com
earth & water resources
GWP Consultants LLP. Registered No. OC326183.
Registered Office: Upton House, Market Street, Charlbury, Oxfordshire OX7 3PJ, UK

Date	Drawn	Checked	Scale
03.10.2024	AEC/EMB	*DJ*	1:150 at A3

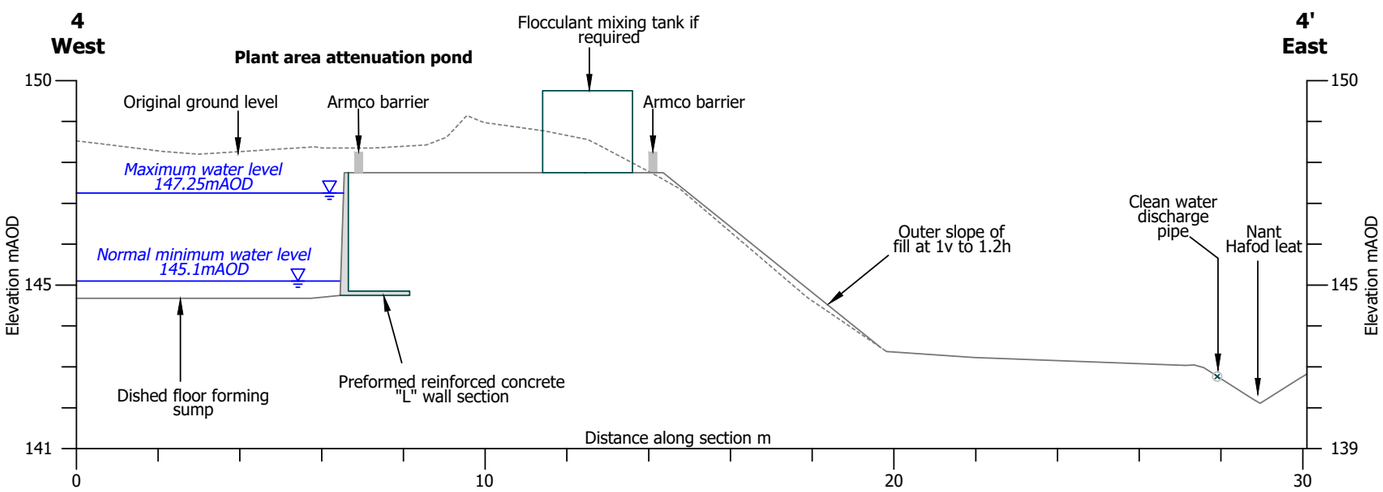
Drawing Ref	Drawing No	Version
HAFODSWM2408	8	b



Section 2-2' through Plant area attenuation pond bank (scale 1:250)



Section 3-3' through Plant area attenuation pond (scale 1:150)



Section 4-4' through Plant area attenuation pond (scale 1:150)

NOTES

- Ground surface derived from the Defra LiDAR DTM 1m 2020.
- See Drawing No. HAFODSWM2408-6 for location of cross section.

Version	Revision and compilation notes	Date
a	Issued	12.09.2024
b	Issued	03.10.2024

Client: Tarmac Trading Limited.

Project: Hafod Quarry, surface water management scheme

Cross sections through Plant area attenuation pond

GWP consultants
Upton House
Market Street, Charlbury
Oxfordshire OX7 3PJ
United Kingdom
tel +44 (0)1608 810374
fax +44 (0)1608 810093
e-mail info@gwp.uk.com
web www.gwp.uk.com
earth & water resources
GWP Consultants LLP. Registered No. OC326183.
Registered Office: Upton House, Market Street, Charlbury, Oxfordshire OX7 3PJ, UK

Date	Drawn	Checked	Scale
03.10.2024	AEC/EMB	DJ	As shown at A3

Drawing Ref	Drawing No	Version
HAFODSWM2408	9	b

Appendix C Greenfield Runoff Rates

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Alan Cobb
Site name:	Hafod Quarry
Site location:	Quarry catchment

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.65839° N
Longitude:	3.128° W
Reference:	919610071
Date:	Aug 13 2024 15:27

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	21.6

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Calculate from dominant HOST
HOST class:	13
BFI / BFIHOST:	0.955
Q_{MED} (l/s):	32.19
Q_{BAR} / Q_{MED} factor:	1.08

Hydrological characteristics

	Default	Edited
SAAR (mm):	1424	1523
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	34.61	37.7
1 in 1 year (l/s):	30.45	33.17
1 in 30 years (l/s):	61.6	67.1
1 in 100 year (l/s):	75.44	82.18
1 in 200 years (l/s):	85.13	92.73

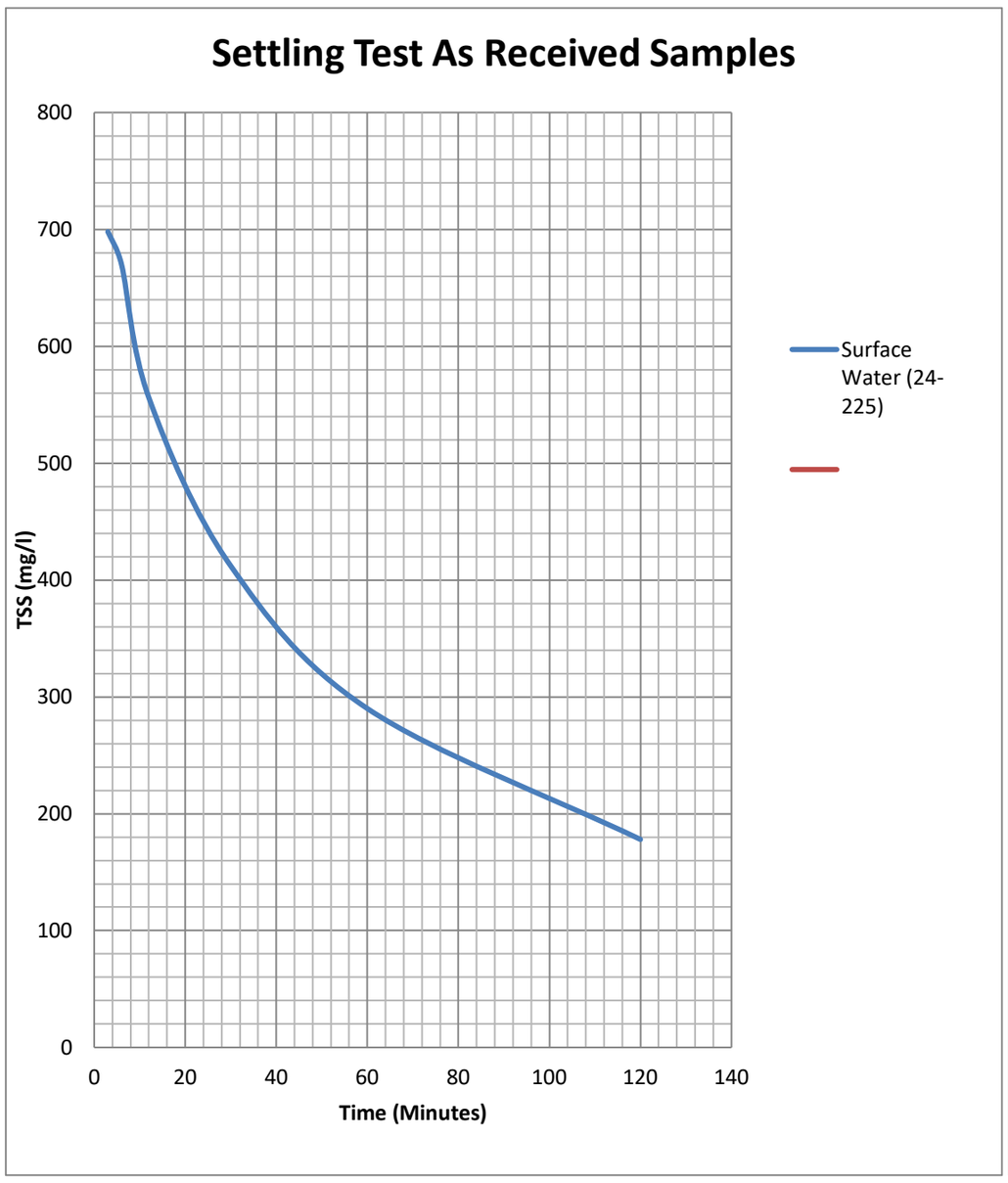
Appendix D Siltbuster Testing Results

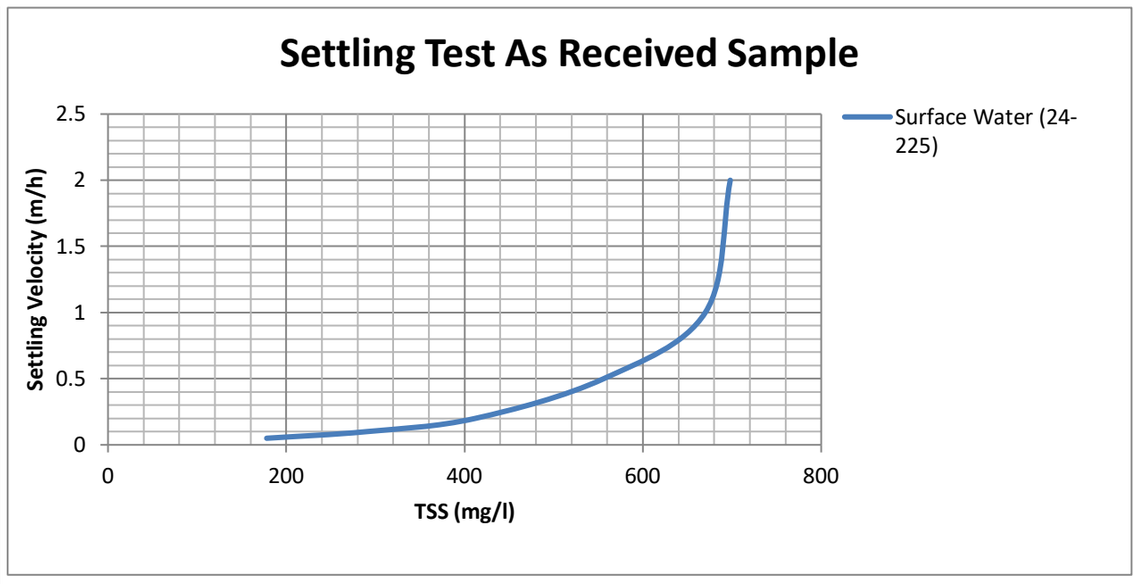
SE33666 Tarmac Sample Delivered (05-09-2024) Summary of Analysis (17/09/2024)

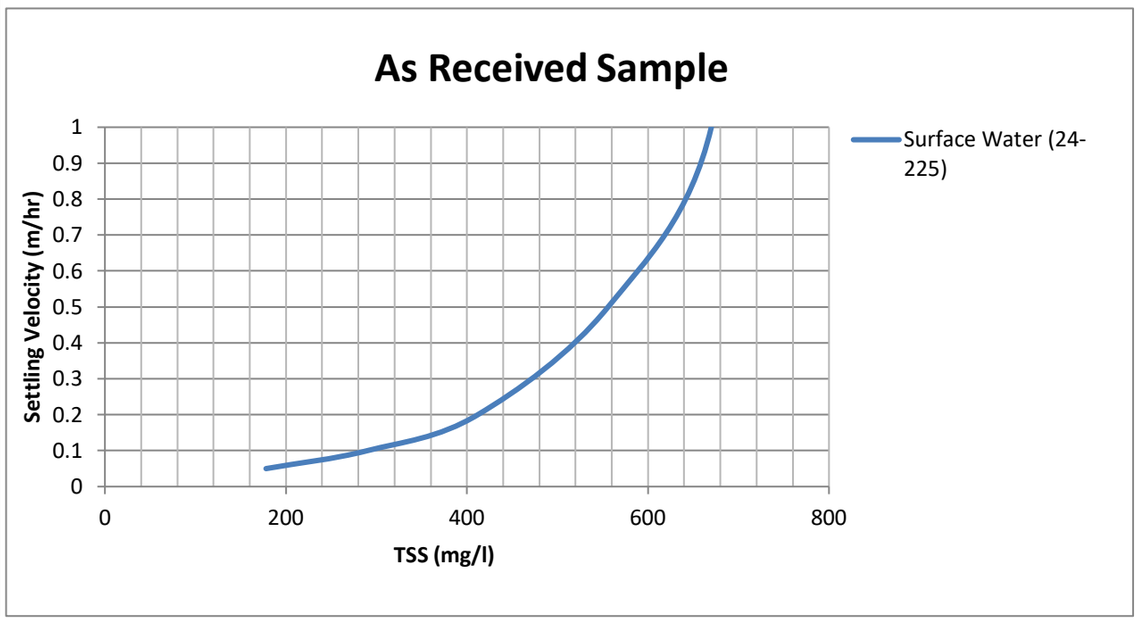
As Received Sample Characterisation				
Sample ID	**Lab Ref**	**pH**	**TSS (mg/l)**	**Comments**
Surface Water	**24-225**	7.86	1000	

Settling Test As Received Samples

	Surface Water (24-225)		
Time (mins)	**Settling Velocity (m/h)**	**TSS (mg/l)**	**Clarity rating (1 = poor, 5 = tap water)**
3	2	698	1
6	1	670	1
12	0.5	556	1
30	0.2	412	1
60	0.1	290	1
120	0.05	178	1







Surface Water Treated Settlement AQ2084					
Time (Mins)	**Rise Rate m/hr**	**TSS (mg/l)**	**% Removal TSS**	**Clarity Rating (1 = poor, 5 = tap water)**	**pH**
3	2	384	61.60	4	
6	1	273	72.70	4	7.88
12	0.5	170	83.00	4	

Surface Water Treated Settlement PAC + AQ2084					
Time (Mins)	**Rise Rate m/hr**	**TSS (mg/l)**	**% Removal TSS**	**Clarity Rating (1 = poor, 5 = tap water)**	**pH**
3	2	16	98.40	4	
6	1	11	98.90	4	6.89
12	0.5	8	99.20	4	

Chemical Treatment Dose Rates		
	Surface Water Treated Settlement PAC + AQ2084	**Surface Water Treated Settlement AQ2084**
Coagulant used	**PAC**	
Dose rate As Aluminium (mg/l)	10	
Dose rate As 10% PAC (6.4 % wt/vol as Al) NEAT	0.156	
PAC Mix Time in (Seconds)	30	
pH after addition of Coagulant	7.58	
Polymer Used	**AQ2084**	**AQ2084**
Polymer dose as active (mg/L)	3	3
Polymer dose as neat product (ml/L)	0.00909	0.00909
Polymer dose as 0.1% active solution (ml/L)	3	3
Floc Strength (1 = weak, 5 = strong)	3	3
Floc Size (1 = pin floc, 5 = cornflake)	3	3

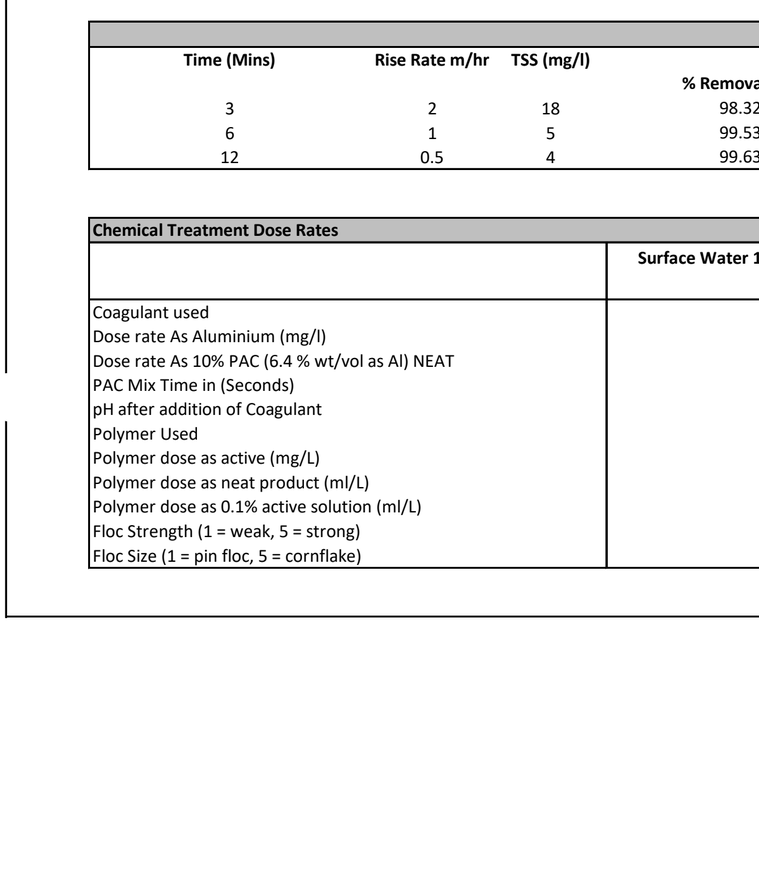
SE33666 Tarmac Sample Delivered (31-10-2024) Summary of Analysis (08/11/2024)

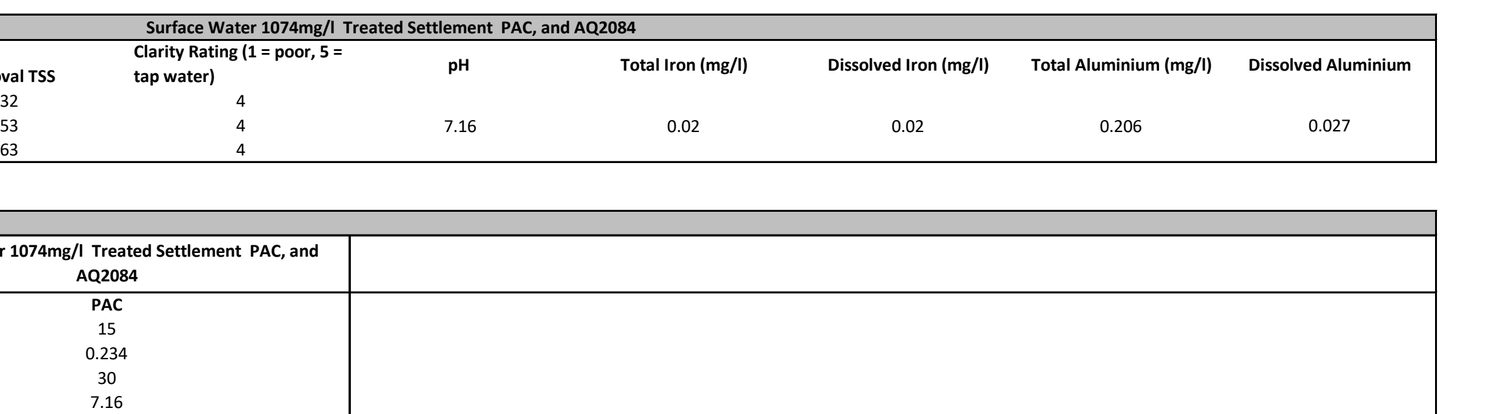
As Received Sample Characterisation

Sample ID	Lab Ref	pH	TSS (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Aluminium (mg/l)	Dissolved Aluminium	Comments
Surface Water 1074mg/l	**24-263**	7.93	1074	5.5	0.02	0.037	0.02	

Settling Test As Received Samples

	Surface Water (24-263)		
Time (mins)	Settling Velocity (m/h)	TSS (mg/l)	Clarity rating (1 = poor, 5 = tap water)
3	2	772	1
6	1	696	1
12	0.5	624	1
30	0.2	480	1
60	0.1	326	1
120	0.05	158	1





Surface Water 1074mg/l Treated Settlement PAC, and AQ2084

Time (Mins)	Rise Rate m/hr	TSS (mg/l)	% Removal TSS	Clarity Rating (1 = poor, 5 = tap water)	pH	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Aluminium (mg/l)	Dissolved Aluminium
3	2	18	98.32	4					
6	1	5	99.53	4	7.16	0.02	0.02	0.206	0.027
12	0.5	4	99.63	4					

Chemical Treatment Dose Rates

	Surface Water 1074mg/l Treated Settlement PAC, and AQ2084	
Coagulant used	**PAC**	
Dose rate As Aluminium (mg/l)	15	
Dose rate As 10% PAC (6.4 % wt/vol as Al) NEAT	0.234	
PAC Mix Time in (Seconds)	30	
pH after addition of Coagulant	7.16	
Polymer Used	**AQ2084**	
Polymer dose as active (mg/L)	4	
Polymer dose as neat product (ml/L)	0.01212	
Polymer dose as 0.1% active solution (ml/L)	4	
Floc Strength (1 = weak, 5 = strong)	3	
Floc Size (1 = pin floc, 5 = cornflake)	3	

Appendix E Material Safety Sheets

Material Safety Data Sheet

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: NC Not Classified

Additional Information:

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

Label elements under CLP: NC Not Classified as Hazardous

Signal Words:

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.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

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 any contaminated clothing. If persistent irritation occurs, seek medical advice

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. Seek medical attention immediately

Inhalation: Move to fresh air. No special first aid measures required.

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

Use fire extinguishers appropriate to the surrounding fire

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 clothing. Spills become extremely slippery when wet

Section 6: Accidental Release Measures

6.1: Personal precautions, protective equipment and emergency procedures

Wear appropriate PPE - See section 8

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

Soak up with inert material. Sweep and shovel into suitable closed conytainers and arrange disposal

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. Do not allow the product to freeze. Incompatible with oxidising agents

7.4: Specific End Use(s)

Section 8: Exposurecontrols/PersonalProtection

8.1: Control Parameters

None known

8 Hour TWA: **15MinSTEL:**

8.2: Exposure Controls

Engineering Measures	Use local exhaust ventilation if misting occurs
Respiratory Protection	respiratory protective equipment is not normally required unser normal conditions of use
Hand Protection	PVC or other plastic material gloves
Eye Protection	Safety glasses with side shields
Skin Protection	Coveralls or chemical apron

Section 9.0: Physical and ChemicalProperties

9.1: Information on basic physical and chemical properties

State:	Liquid
Colour:	Milky
Odour:	Aliphatic
Specific Gravity:	1.05
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

Oxides of Carbon and Nitrogen

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

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 F MT50 Maintenance Schedule

GENERAL MAINTENANCE SCHEDULE – MIX TANK

General Maintenance Schedule (GMS) should be followed to ensure the optimum functionality of the unit. The following table outlines general requirements of maintenance necessary. General maintenance schedule outlines recommend checks and maintenance for the Mix Tank unit but may not encompass all scenarios.

MIX TANK	DAILY	WEEKLY	MONTHLY	QUARTERLY	12 MONTHS	36 MONTHS	60 MONTHS
Check mixers are operating as expected, with no excessive noise and no excessive shaft movement.	●						
Check the top of the tank and gearboxes for sign of oil leaks		●					
Check the area for loose/missing nuts, bolts or screws		●					
Check the motor vents are clean and free of debris		●					
Check all external cables for damage		●					
Check all electrical covers are fitted and in good condition		●					
Measure motor phases and current draw to ensure within limits and balanced.				●			
Check the motor terminal boxes and isolators for cleanliness and general condition					●		
Replace the mixer gearbox oil						●	

Appendix G HB50R Maintenance Schedule

GENERAL MAINTENANCE SCHEDULE – HB50M

General Maintenance Schedule (GMS) should be followed to ensure the optimum functionality of the unit. The following table outlines general requirements of maintenance necessary. General maintenance schedule outlines recommend checks and maintenance for the HB50M unit but may not encompass all scenarios.

HB50M	DAILY	WEEKLY	MONTHLY	QUARTERLY	6 MONTHS	12 MONTHS	24 MONTHS
Check inlet flow freely into the unit	●						
Check treated water quality at discharge	●						
Check outlet flow freely out of the unit	●						
Test emergency stop and safety interlocks	●						
Inspection of sediment build-up on lamellar plates	●						
Check effluent pipework for leaks and deterioration	●						
Check sludge pump fully operational	●						
Check sludge pump housing and gearboxes for sign of oil leaks	●						
Check sludge pump housing lubrication level	●						

GENERAL MAINTENANCE SCHEDULE – HB50M

General Maintenance Schedule (GMS) should be followed to ensure the optimum functionality of the unit. The following table outlines general requirements of maintenance necessary. General maintenance schedule outlines recommend checks and maintenance for the HB50M unit but may not encompass all scenarios.

HB50M	DAILY	WEEKLY	MONTHLY	QUARTERLY	6 MONTHS	12 MONTHS	24 MONTHS
Check sludge pump geared motor unit lubrication level	●						
Check pump for unusual temperatures or noise in operation	●						
In-situ lamellar plates cleaning		● OR AS REQUIRED					
Check sludge pump for excessive noise and vibration		●					
Check the motor vents are clean and free of debris		●					
Inspect external of local control panel for signs of mechanical damage and deterioration		●					
Check control panel lights and switches are illuminating correctly		●					
Check all internal and external cables for damage		●					
Draining of tank and washing down plates			● OR AS REQUIRED				

GENERAL MAINTENANCE SCHEDULE – HB50M

General Maintenance Schedule (GMS) should be followed to ensure the optimum functionality of the unit. The following table outlines general requirements of maintenance necessary. General maintenance schedule outlines recommend checks and maintenance for the HB50M unit but may not encompass all scenarios.

HB50M	DAILY	WEEKLY	MONTHLY	QUARTERLY	6 MONTHS	12 MONTHS	24 MONTHS
Greasing knife gate valves (rising stem)			●				
Check sludge pump motor currents to ensure within limits and balanced.				●			
Check sludge pump motor terminal boxes and isolators for cleanliness and general condition					●		
Replace sludge pump housing lubricant					●		
Replace sludge pump hose						● OR AS REQUIRED	
Check pump housing and rotor internally						●	
Drain down completely and carry out a thorough inspection of paintwork and structural integrity						●	

*- or as when required

Appendix H Audit Log

Surface Water System - Monthly Inspections

Month:
Jan-25

ITEM REF:	Components of System	Inspection:	Frequency	Condition:	COMMENTS:	ACTIONS REQUIRED
	Silt Buster HB50M - clarifier	Take from document General Maintenance Schedule (GMS 2.2) - Siltbuster HB50M	Daily			
			Weekly			
			Monthly			
			Quarterly			
			Six Monthly			
			12 Months			
	Mix Tank	Take from document General Maintenance Schedule (GMS 6.1) - Siltbuster Mix Tank	Daily			
			Weekly			
			Monthly			
			Quarterly			
			Six Monthly			
			12 Months			
			36 Months			
	Chemical iCDS	Take from document General Maintenance Schedule (GMS5.1) - iCDS	Daily			
			Weekly			
			Monthly			
			Quarterly			
			Six Monthly			
			Annual			

Did you note any other points of interest or concern (if yes please give details)?		

Surface Water System - Monthly Inspections

Month:
Jan-25

ITEM REF:	Components of System	Example of Inspection:	Condition:	COMMENTS:	ACTIONS REQUIRED
4	**Cattle Grid Sumps #4 - See Plan**	Check Last date of Emptying: Check levels of sediment is below outlet pipe within pits. Check Grid condition			
	Silt Traps - See plan	Confirm last date of servicing: Removal of Lids from Silt trap #1 Check upper discharge pipes are in place Visual check inside for silt levels where possible			
	Road Gulleys - See plan	Random selection of road gulleys General condition check Water present Grid not blocked			
	Interceptor Unit - See Plan	Check Last date of Emptying: Normal Interval 6mths			
	Discharge Pipe into Leat from Interceptor	Check discharge volume and condition from Pipe			
1	**Recirculation Pond #1 - Quarry**	Check silt build up Water flows from quarry into area Safety Checks			
2	**Settlement Pond #2 - Pump**	Safety Barrier checks - see report sheet Pump Operation - Water flow: IN pond, rear RHS flow, and from roads Water Flow : Out overflow into underground pipe Silt build up			
3	**Open Culvert #3 Old Labs**	Check flow of water Check for flow from Weighbridge Pit Clear any vegitation with strainer from waters			
8	**Weighbridge Pit**	Checks on volume of material around and beneath weighbridge ends and cabin			
9	**Road Sweeper Tipping Pit:**	Check tipping area Check tipped material is being removed			
7	**Stockyard Sump #7**	Check security, pipework and silt levels			
	Water Sampling - Monthly	Take water sample @ consented discharge point			
	Water Flow Meter Download - Quarterly	Download of data from logger			
	Water F Sampling - NRW	Take water sample @ consented discharge point			
	Did you note any other points of interest or concern (if yes please give details)?				

Appendix I Water Quality Results

SOCOTEC
Environmental Chemistry

Certificate of Analysis

Client: Tarmac Ltd

Project: 24113761

Quote: BEC241037741 V2.1

Project Ref: Scheduled Samples 12-2024

Site: Hafod December

Contact: Paul Stanyard

Address: Meeting Street
Quorn
Loughborough
Leicestershire
LE12 8EX

E-Mail: Paul.stanyard@tarmac.com

Phone: 01509 622 055

No. Samples Received: 9

Date Received: 27/11/2024

Analysis Completed: 11/12/2024

Date Issued: 11/12/2024

Report Type: Version 02

This report supersedes any versions previously issued by the laboratory

Reported by Customer Service Co-Ordinator
Julie Dickinson
01283 554670
Julie.Dickinson@socotec.co.uk

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

Samples Analysed

Text ID	Sample Reference	Sampling Date	Sample Type	Sample Description
24113761-001	HAF_Discharge	25/11/2024 00:00:00	WATER	Surface Water
24113761-002	HAF_Discharge U/S	25/11/2024 00:00:00	WATER	Surface Water
24113761-003	HAF_Discharge D/S	25/11/2024 00:00:00	WATER	Surface Water
24113761-004	HAF_S1	25/11/2024 00:00:00	WATER	Surface Water
24113761-005	HAF_S2	25/11/2024 00:00:00	WATER	Surface Water
24113761-006	HAF_S3	25/11/2024 00:00:00	WATER	Surface Water
24113761-007	HAF_S4	25/11/2024 00:00:00	WATER	Surface Water
24113761-008	HAF_S5	25/11/2024 00:00:00	WATER	Surface Water
24113761-009	HAF_S6	25/11/2024 00:00:00	WATER	Surface Water

SOCOTEC

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

UKAS TESTING 1252

Analysis Results

Method Code	Analysis	MDL	Accred.	SOCOTEC Sample ID:	24113761-001	24113761-002	24113761-003	24113761-004	24113761-005
				Sampling Date:	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
				Customer ID:	HAF_Discharge	HAF_Discharge U/S	HAF_Discharge D/S	HAF_S1	HAF_S2
PHCONDW	pH	1 pH units	U		7.6	7.6	7.6	6.9	6.9
PHCONDW	Conductivity at 25°C	100 µS/cm	U		307	235	231	421	527
WSLM20	BOD (5 day)	1 mg O2/l	U		1.0	1.4	1.1	<1.0	<1.0
WSLM10	Total Suspended Solids	5 mg/l	U		53	26	26	29	<5
WSLM30	Turbidity	1 ntu	N		73	34	24	19	6
SFAPI	Total Cyanide	0.02 mg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
ICPWATVAR (Dissolved)	Aluminium as Al	0.01 mg/l	U		<0.01	0.01	0.01	<0.01	<0.01
ICPMSW (Dissolved)	Cadmium as Cd	0.00002 mg/l	U		0.00002	0.00003	0.00003	0.00002	0.00003
ICPWATVAR (Dissolved)	Calcium as Ca	1 mg/l	U		29	24	23	42	58
ICPMSW (Dissolved)	Total Chromium as Cr	0.001 mg/l	U		<0.001	<0.001	<0.001	<0.001	<0.001
ICPMSW (Dissolved)	Copper as Cu	0.001 mg/l	U		<0.001	<0.001	<0.001	<0.001	<0.001
ICPWATVAR (Dissolved)	Iron as Fe	0.01 mg/l	U		<0.01	0.04	0.04	<0.01	<0.01
ICPMSW (Dissolved)	Lead as Pb	0.0002 mg/l	U		<0.0002	<0.0002	0.0002	<0.0002	<0.0002
ICPWATVAR (Dissolved)	Magnesium as Mg	1 mg/l	U		16	8	8	22	27
ICPMSW (Dissolved)	Mercury as Hg	0.00003 mg/l	U		<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
ICPMSW (Dissolved)	Nickel as Ni	0.001 mg/l	U		<0.001	0.002	0.003	0.001	0.001
ICPWATVAR (Dissolved)	Potassium as K	1 mg/l	U		2	2	2	4	5
ICPWATVAR (Dissolved)	Sodium as Na	1 mg/l	U		7	8	8	9	11
ICPWATVAR (Dissolved)	Total Sulphur as SO4	3 mg/l	U		75	41	40	70	96
ICPMSW (Dissolved)	Zinc as Zn	0.002 mg/l	U		0.005	0.006	0.006	0.005	0.007
TPHFID	>C8-C10 (EH_1D_Total)	0.01 mg/l	U		<0.01				
	Total TPH >C8-C40 (EH_1D_Total)	0.01 mg/l	U		0.03				
	>C10-C12 (EH_1D_Total)	0.01 mg/l	U		<0.01				
	>C12-C16 (EH_1D_Total)	0.01 mg/l	U		<0.01				
	>C16-C21 (EH_1D_Total)	0.01 mg/l	U		<0.01				
	>C21-C35 (EH_1D_Total)	0.01 mg/l	U		0.02				
FTIRSWPER	TPH by FTIR	0.3 mg/l	N		<0.3	<0.3	<0.3	<0.3	<0.3
SVOCSW	Broadscan list	0.01 mg/l	N		See Attached	See Attached	See Attached	See Attached	See Attached
	Derivatised broadscan list	0.01 mg/l	N		See Attached	See Attached	See Attached	See Attached	See Attached
VOCHSAW	1,1,1,2-Tetrachloroethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,1,1-Trichloroethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,1,2,2-Tetrachloroethane	1 µg/l	N		<1	<1	<1	<1	<1
	1,1,2-Trichloroethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,1-Dichloroethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,1-Dichloroethene	1 µg/l	U		<1	<1	<1	<1	<1
	1,1-Dichloropropene	1 µg/l	U		<1	<1	<1	<1	<1
	1,2,3-Trichlorobenzene	5 µg/l	U		<5	<5	<5	<5	<5
	1,2,3-Trichloropropane	1 µg/l	U		<1	<1	<1	<1	<1
	1,2,4-Trichlorobenzene	5 µg/l	U		<5	<5	<5	<5	<5
	1,2,4-Trimethylbenzene	1 µg/l	U		<1	<1	<1	<1	<1
	1,2-Dibromo-3-chloropropane	5 µg/l	U		<5	<5	<5	<5	<5
	1,2-Dibromoethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,2-Dichlorobenzene	5 µg/l	U		<5	<5	<5	<5	<5
	1,2-Dichloroethane	1 µg/l	U		<1	<1	<1	<1	<1
	1,2-Dichloropropane	1 µg/l	U		<1	<1	<1	<1	<1
	1,3,5-Trimethylbenzene	0.6 µg/l	U		<0.6	<0.6	<0.6	<0.6	<0.6
	1,3-Dichlorobenzene	1 µg/l	U		<1	<1	<1	<1	<1
	1,3-Dichloropropane	1 µg/l	N		<1	<1	<1	<1	<1
	1,4-Dichlorobenzene	1 µg/l	U		<1	<1	<1	<1	<1
	2,2-Dichloropropane	1 µg/l	N		<1	<1	<1	<1	<1
	2-Chlorotoluene	1 µg/l	U		<1	<1	<1	<1	<1
	4-Chlorotoluene	1 µg/l	U		<1	<1	<1	<1	<1
	Benzene	1 µg/l	U		<1	<1	<1	<1	<1
	Bromobenzene	1 µg/l	U		<1	<1	<1	<1	<1
	Bromochloromethane	1 µg/l	U		<1	<1	<1	<1	<1
	Bromodichloromethane	1 µg/l	U		<1	<1	<1	<1	<1
	Bromoform	1 µg/l	U		<1	<1	<1	<1	<1
	Bromomethane	5 µg/l	N		<5	<5	<5	<5	<5
	Carbon Tetrachloride	1 µg/l	U		<1	<1	<1	<1	<1
	Chlorobenzene	1 µg/l	U		<1	<1	<1	<1	<1
	Chloroethane	5 µg/l	U		<5	<5	<5	<5	<5
	Chloroform	5 µg/l	U		<5	<5	<5	<5	<5
	Chloromethane	1 µg/l	U		<1	<1	<1	<1	<1
	cis 1,2-Dichloroethene	1 µg/l	U		<1	<1	<1	<1	<1
	cis 1,3-Dichloropropene	1 µg/l	N		<1	<1	<1	<1	<1
	Dibromochloromethane	1 µg/l	U		<1	<1	<1	<1	<1
	Dibromomethane	1 µg/l	U		<1	<1	<1	<1	<1
	Dichlorodifluoromethane	1 µg/l	N		<1	<1	<1	<1	<1
	Ethylbenzene	0.5 µg/l	U		<0.5	<0.5	<0.5	<0.5	<0.5
	Hexachlorobutadiene	5 µg/l	U		<5	<5	<5	<5	<5
	iso-Propylbenzene	1 µg/l	U		<1	<1	<1	<1	<1
	m and p-Xylene	1 µg/l	U		<1	<1	<1	<1	<1
	MTBE	1 µg/l	N		<1	<1	<1	<1	<1
	Naphthalene	5 µg/l	U		<5	<5	<5	<5	<5
	n-Butylbenzene	1 µg/l	U		<1	<1	<1	<1	<1
	o-Xylene	1 µg/l	U		<1	<1	<1	<1	<1
	p-Isopropyltoluene	1 µg/l	U		<1	<1	<1	<1	<1
	Propylbenzene	1 µg/l	U		<1	<1	<1	<1	<1
	sec-Butylbenzene	1 µg/l	U		<1	<1	<1	<1	<1

SOCOTEC

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

UKAS TESTING 1252

Analysis Results

Method Code	Analysis	MDL	Accred.	SOCOTEC Sample ID:	24113761-001	24113761-002	24113761-003	24113761-004	24113761-005
				Sampling Date:	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
				Customer ID:	HAF_Discharge	HAF_Discharge U/S	HAF_Discharge D/S	HAF_S1	HAF_S2
VOCHSAW	Styrene	1 µg/l	U		<1	<1	<1	<1	<1
	tert-Butylbenzene	1 µg/l	U		<1	<1	<1	<1	<1
	Tetrachloroethene	5 µg/l	U		<5	<5	<5	<5	<5
	Toluene	1 µg/l	U		<1	<1	<1	<1	<1
	trans 1,2-Dichloroethene	1 µg/l	U		<1	<1	<1	<1	<1
	trans 1,3-Dichloropropene	1 µg/l	U		<1	<1	<1	<1	<1
	Trichloroethene	5 µg/l	U		<5	<5	<5	<5	<5
	Trichlorofluoromethane	1 µg/l	U		<1	<1	<1	<1	<1
	Vinyl Chloride	1 µg/l	U		<1	<1	<1	<1	<1
PESTSW-OCP	1,2,3,4-Tetrachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	1,2,3-Trichlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	1,3,5-Trichlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	2,6-Dichlorobenzonitrile	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Aldrin	0.01 µg/l	N		<0.01	<0.01	0.01	<0.01	<0.01
	Alpha-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Beta-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Chlorthalonil	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	cis-Chlordane	0.01 µg/l	N		0.01	<0.01	0.02	0.02	<0.01
	cis-Permethrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Delta-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Dieldrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Endosulfan I	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Endosulfan II	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Endosulfan sulfate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Endrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Endrin ketone	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Gamma-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Heptachlor	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Heptachlor epoxide	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Hexachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Isodrin	0.01 µg/l	N		<0.01	<0.01	<0.01	0.01	<0.01
	Methoxychlor	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	o,p'-DDD	0.01 µg/l	N		<0.01	<0.01	<0.01	0.01	<0.01
	o,p'-DDE	0.01 µg/l	N		0.02	0.01	0.02	0.03	<0.01
	o,p'-DDT	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	p,p'-DDD	0.01 µg/l	N		<0.01	<0.01	<0.01	0.01	<0.01
	p,p'-DDE	0.01 µg/l	N		0.01	0.01	0.02	0.03	<0.01
	p,p'-DDT	0.01 µg/l	N		<0.01	<0.01	0.02	0.02	<0.01
	Pendimethalin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Pentachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Propyzamide	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Tecnazene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	trans-Chlordane	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	trans-Permethrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Triadimefon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Triallate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Trifluralin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
PESTSW-OPP	Azinphos-ethyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Azinphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Carbofenthion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Chlorpyrifos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Chlorpyriphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Clorfenvinfos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Diazinon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Dichlorvos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Dimethoate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Ethion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Etrimphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Fenitrothion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Fenthion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Malathion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Methacrifos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Mevinphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Parathion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Parathion-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Phosalone	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Phosphamidon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Pirimiphos-ethyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Pirimiphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Propetamphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	Triazophos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
AHBLCMS	2,3,6-TBA	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	2,4,5-T	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03	<0.03
	2,4-D	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03	<0.03
	2,4-DB	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	2,4-Dinitrophenol	0.05 µg/l	U		<0.05	<0.05	<0.05	<0.05	<0.05
	Benazolin	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	Bentazone	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	Bromoxynil	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03	<0.03

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

UKAS TESTING 1252

Analysis Results

Method Code	Analysis	MDL	Accred.	SOCOTEC Sample ID:	24113761-001	24113761-002	24113761-003	24113761-004	24113761-005
				Sampling Date:	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
				Customer ID:	HAF_Discharge	HAF_Discharge U/S	HAF_Discharge D/S	HAF_S1	HAF_S2
AHBLCMS	Clopyralid	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	Dicamba	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	Dichloroprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	DNOC	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	Fenoprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	Fluroxypyr	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03	<0.03
	Ioxynil	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	MCPA	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	MCPB	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	Mecoprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02	<0.02
	Pentachlorophenol	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04	<0.04
	Triclopyr	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03	<0.03
PCBECD	PCB 28	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 52	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 101	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 118	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 138	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 153	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
	PCB 180	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01	<0.01
OGSNMS	Dibutyltin as Sn	20 ng Sn/l	N		<20	<20	<20	<20	<20
	Tributyltin as Sn	20 ng Sn/l	N		<20	<20	<20	<20	<20
	Triphenyltin as Sn	50 ng Sn/l	N		<50	<50	<50	<50	<50

SOCOTEC

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

UKAS TESTING 1252

Analysis Results

Method Code	Analysis	MDL	Accred.	24113761-006	24113761-007	24113761-008	24113761-009
SOCOTEC Sample ID:				24113761-006	24113761-007	24113761-008	24113761-009
Sampling Date:				25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
Customer ID:				HAF_S3	HAF_S4	HAF_S5	HAF_S6
PHCONDW	pH	1 pH units	U	7.6	7.1	7.0	7.3
PHCONDW	Conductivity at 25°C	100 µS/cm	U	230	127	394	388
WSLM20	BOD (5 day)	1 mg O2/l	U	<1.0	1.2	<1.0	<1.0
WSLM10	Total Suspended Solids	5 mg/l	U	11	<5	98	307
WSLM30	Turbidity	1 ntu	N	43	3	183	377
SFAPI	Total Cyanide	0.02 mg/l	U	<0.02	<0.02	<0.02	<0.02
ICPWATVAR (Dissolved)	Aluminium as Al	0.01 mg/l	U	<0.01	0.01	<0.01	<0.01
ICPMSW (Dissolved)	Cadmium as Cd	0.00002 mg/l	U	<0.00002	<0.00002	<0.00002	<0.00002
ICPWATVAR (Dissolved)	Calcium as Ca	1 mg/l	U	20	10	36	36
ICPMSW (Dissolved)	Total Chromium as Cr	0.001 mg/l	U	<0.001	<0.001	<0.001	<0.001
ICPMSW (Dissolved)	Copper as Cu	0.001 mg/l	U	<0.001	<0.001	<0.001	<0.001
ICPWATVAR (Dissolved)	Iron as Fe	0.01 mg/l	U	<0.01	0.03	<0.01	<0.01
ICPMSW (Dissolved)	Lead as Pb	0.0002 mg/l	U	<0.0002	<0.0002	<0.0002	<0.0002
ICPWATVAR (Dissolved)	Magnesium as Mg	1 mg/l	U	14	5	24	23
ICPMSW (Dissolved)	Mercury as Hg	0.00003 mg/l	U	<0.00003	<0.00003	<0.00003	<0.00003
ICPMSW (Dissolved)	Nickel as Ni	0.001 mg/l	U	<0.001	<0.001	<0.001	<0.001
ICPWATVAR (Dissolved)	Potassium as K	1 mg/l	U	2	1	2	2
ICPWATVAR (Dissolved)	Sodium as Na	1 mg/l	U	3	3	6	6
ICPWATVAR (Dissolved)	Total Sulphur as SO4	3 mg/l	U	52	12	128	122
ICPMSW (Dissolved)	Zinc as Zn	0.002 mg/l	U	<0.002	0.002	0.002	<0.002
FTIRSWPER	TPH by FTIR	0.3 mg/l	N	<0.3	<0.3	<0.3	<0.3
SVOCSW	Broadscan list	0.01 mg/l	N	See Attached	See Attached	See Attached	See Attached
	Derivatised broadscan list	0.01 mg/l	N	See Attached	See Attached	See Attached	See Attached
VOCHSAW	1,1,1,2-Tetrachloroethane	1 µg/l	U	<1	<1	<1	<1
	1,1,1-Trichloroethane	1 µg/l	U	<1	<1	<1	<1
	1,1,2,2-Tetrachloroethane	1 µg/l	N	<1	<1	<1	<1
	1,1,2-Trichloroethane	1 µg/l	U	<1	<1	<1	<1
	1,1-Dichloroethane	1 µg/l	U	<1	<1	<1	<1
	1,1-Dichloroethene	1 µg/l	U	<1	<1	<1	<1
	1,1-Dichloropropene	1 µg/l	U	<1	<1	<1	<1
	1,2,3-Trichlorobenzene	5 µg/l	U	<5	<5	<5	<5
	1,2,3-Trichloropropane	1 µg/l	U	<1	<1	<1	<1
	1,2,4-Trichlorobenzene	5 µg/l	U	<5	<5	<5	<5
	1,2,4-Trimethylbenzene	1 µg/l	U	<1	<1	<1	<1
	1,2-Dibromo-3-chloropropane	5 µg/l	U	<5	<5	<5	<5
	1,2-Dibromoethane	1 µg/l	U	<1	<1	<1	<1
	1,2-Dichlorobenzene	5 µg/l	U	<5	<5	<5	<5
	1,2-Dichloroethane	1 µg/l	U	<1	<1	<1	<1
	1,2-Dichloropropane	1 µg/l	U	<1	<1	<1	<1
	1,3,5-Trimethylbenzene	0.6 µg/l	U	<0.6	<0.6	<0.6	<0.6
	1,3-Dichlorobenzene	1 µg/l	U	<1	<1	<1	<1
	1,3-Dichloropropane	1 µg/l	N	<1	<1	<1	<1
	1,4-Dichlorobenzene	1 µg/l	U	<1	<1	<1	<1
	2,2-Dichloropropane	1 µg/l	N	<1	<1	<1	<1
	2-Chlorotoluene	1 µg/l	U	<1	<1	<1	<1
	4-Chlorotoluene	1 µg/l	U	<1	<1	<1	<1
	Benzene	1 µg/l	U	<1	<1	<1	<1
	Bromobenzene	1 µg/l	U	<1	<1	<1	<1
	Bromochloromethane	1 µg/l	U	<1	<1	<1	<1
	Bromodichloromethane	1 µg/l	U	<1	<1	<1	<1
	Bromoform	1 µg/l	U	<1	<1	<1	<1
	Bromomethane	5 µg/l	N	<5	<5	<5	<5
	Carbon Tetrachloride	1 µg/l	U	<1	<1	<1	<1
	Chlorobenzene	1 µg/l	U	<1	<1	<1	<1
	Chloroethane	5 µg/l	U	<5	<5	<5	<5
	Chloroform	5 µg/l	U	<5	<5	<5	<5
	Chloromethane	1 µg/l	U	<1	<1	<1	<1
	cis 1,2-Dichloroethene	1 µg/l	U	<1	<1	<1	<1
	cis 1,3-Dichloropropene	1 µg/l	N	<1	<1	<1	<1
	Dibromochloromethane	1 µg/l	U	<1	<1	<1	<1
	Dibromomethane	1 µg/l	U	<1	<1	<1	<1
	Dichlorodifluoromethane	1 µg/l	N	<1	<1	<1	<1
	Ethylbenzene	0.5 µg/l	U	<0.5	<0.5	<0.5	<0.5
	Hexachlorobutadiene	5 µg/l	U	<5	<5	<5	<5
	iso-Propylbenzene	1 µg/l	U	<1	<1	<1	<1
	m and p-Xylene	1 µg/l	U	<1	<1	<1	<1
	MTBE	1 µg/l	N	<1	<1	<1	<1
	Naphthalene	5 µg/l	U	<5	<5	<5	<5
	n-Butylbenzene	1 µg/l	U	<1	<1	<1	<1
	o-Xylene	1 µg/l	U	<1	<1	<1	<1
	p-Isopropyltoluene	1 µg/l	U	<1	<1	<1	<1
	Propylbenzene	1 µg/l	U	<1	<1	<1	<1
	sec-Butylbenzene	1 µg/l	U	<1	<1	<1	<1
	Styrene	1 µg/l	U	<1	<1	<1	<1
	tert-Butylbenzene	1 µg/l	U	<1	<1	<1	<1
	Tetrachloroethene	5 µg/l	U	<5	<5	<5	<5
	Toluene	1 µg/l	U	<1	<1	<1	<1
	trans 1,2-Dichloroethene	1 µg/l	U	<1	<1	<1	<1
	trans 1,3-Dichloropropene	1 µg/l	U	<1	<1	<1	<1

Analysis Results

Method Code	Analysis	MDL	Accred.	SOCOTEC Sample ID:	24113761-006	24113761-007	24113761-008	24113761-009
				Sampling Date:	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
				Customer ID:	HAF_S3	HAF_S4	HAF_S5	HAF_S6
VOCHSAW	Trichloroethene	5 µg/l	U		<5	<5	<5	<5
	Trichlorofluoromethane	1 µg/l	U		<1	<1	<1	<1
	Vinyl Chloride	1 µg/l	U		<1	<1	<1	<1
PESTSW-OCP	1,2,3,4-Tetrachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	1,2,3-Trichlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	1,3,5-Trichlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	2,6-Dichlorobenzonitrile	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Aldrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Alpha-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Beta-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Chlorthalonil	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	cis-Chlordane	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	cis-Permethrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Delta-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Dieldrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Endosulfan I	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Endosulfan II	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Endosulfan sulfate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Endrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Endrin ketone	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Gamma-HCH	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Heptachlor	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Heptachlor epoxide	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Hexachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Isodrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Methoxychlor	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	o,p'-DDD	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	o,p'-DDE	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	o,p'-DDT	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	p,p'-DDD	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	p,p'-DDE	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	p,p'-DDT	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Pendimethalin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Pentachlorobenzene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Propyzamide	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Tecnazene	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	trans-Chlordane	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	trans-Permethrin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Triadimefon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Triallate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Trifluralin	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
PESTSW-OPP	Azinphos-ethyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Azinphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Carbofenthion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Chlorpyrifos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Chlorpyriphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Clorfenvinfos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Diazinon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Dichlorvos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Dimethoate	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Ethion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Etrimphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Fenitrothion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Fenthion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Malathion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Methacrifos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Mevinphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Parathion	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Parathion-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Phosalone	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Phosphamidon	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Pirimiphos-ethyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Pirimiphos-methyl	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Propetamphos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	Triazophos	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
AHBLCMS	2,3,6-TBA	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	2,4,5-T	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03
	2,4-D	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03
	2,4-DB	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	2,4-Dinitrophenol	0.05 µg/l	U		<0.05	<0.05	<0.05	<0.05
	Benazolin	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	Bentazone	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	Bromoxynil	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03
	Clopyralid	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	Dicamba	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	Dichloroprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	DNOC	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	Fenoprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	Fluroxypyr	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

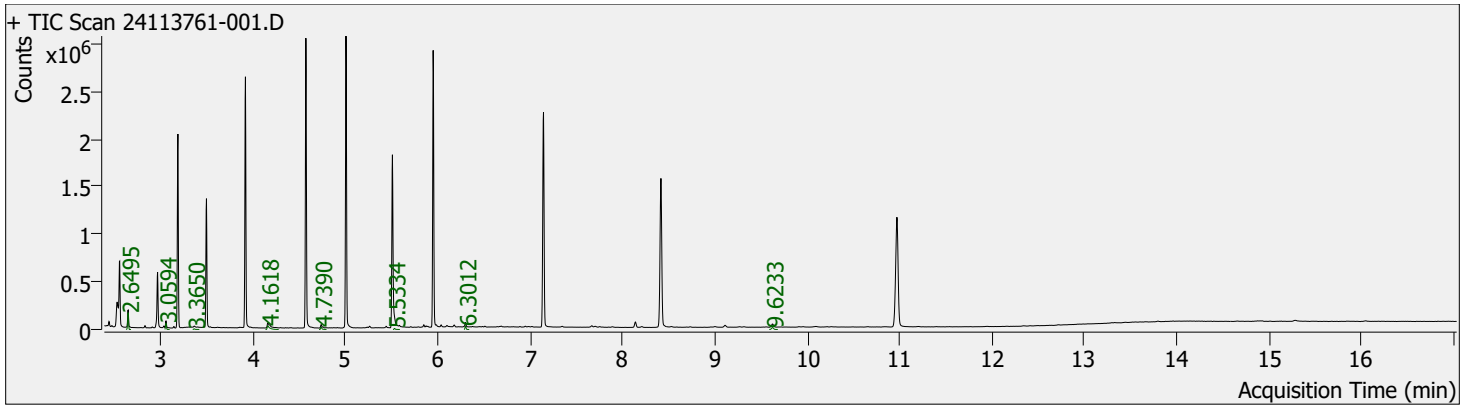
1252

Analysis Results

Method Code	Analysis	MDL	Accred.	SOCOTEC Sample ID:	24113761-006	24113761-007	24113761-008	24113761-009
				Sampling Date:	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00	25/11/2024 00:00
				Customer ID:	HAF_S3	HAF_S4	HAF_S5	HAF_S6
AHBLCMS	Ioxynil	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	MCPA	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	MCPB	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	Mecoprop	0.02 µg/l	U		<0.02	<0.02	<0.02	<0.02
	Pentachlorophenol	0.04 µg/l	U		<0.04	<0.04	<0.04	<0.04
	Triclopyr	0.03 µg/l	U		<0.03	<0.03	<0.03	<0.03
PCBECD	PCB 28	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 52	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 101	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 118	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 138	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 153	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
	PCB 180	0.01 µg/l	N		<0.01	<0.01	<0.01	<0.01
OGSNMS	Dibutyltin as Sn	20 ng Sn/l	N		<20	<20	<20	<20
	Tributyltin as Sn	20 ng Sn/l	N		<20	<20	<20	<20
	Triphenyltin as Sn	50 ng Sn/l	N		<50	<50	<50	<50

SOCOTEC - SVOC Unknowns Analysis Report

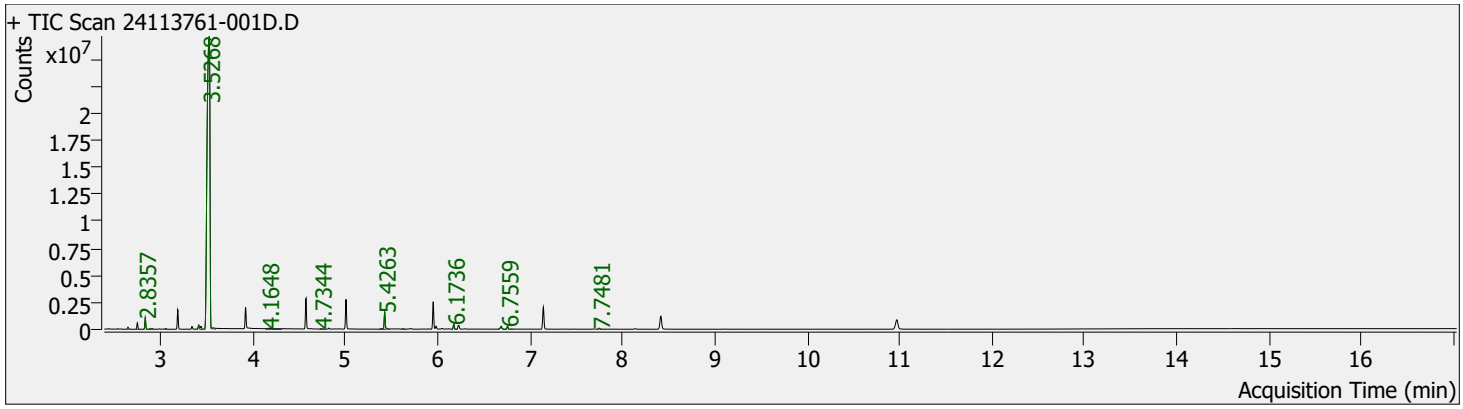
Sample Name: 24113761-001



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
	None Detected			

SOCOTEC - SVOC Unknowns Analysis Report

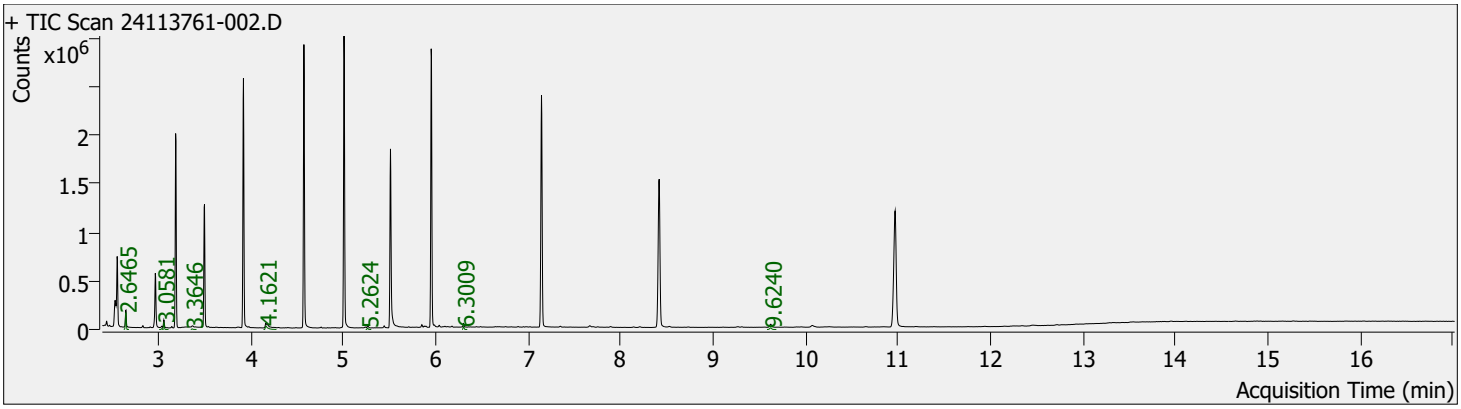
Sample Name: 24113761-001D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5268	Benzenamine, N,N-dimethyl-	98.3	121-69-7	2.75 mg/l
2.8357	Benzene, 1-fluoro-2-methoxy-	98.1	321-28-8	0.03 mg/l
3.4138	Aniline, N-methyl-	96.2	100-61-8	0.02 mg/l
5.4263	Benzene, 1,3,5-tribromo-2-methoxy-	97.8	607-99-8	0.01 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

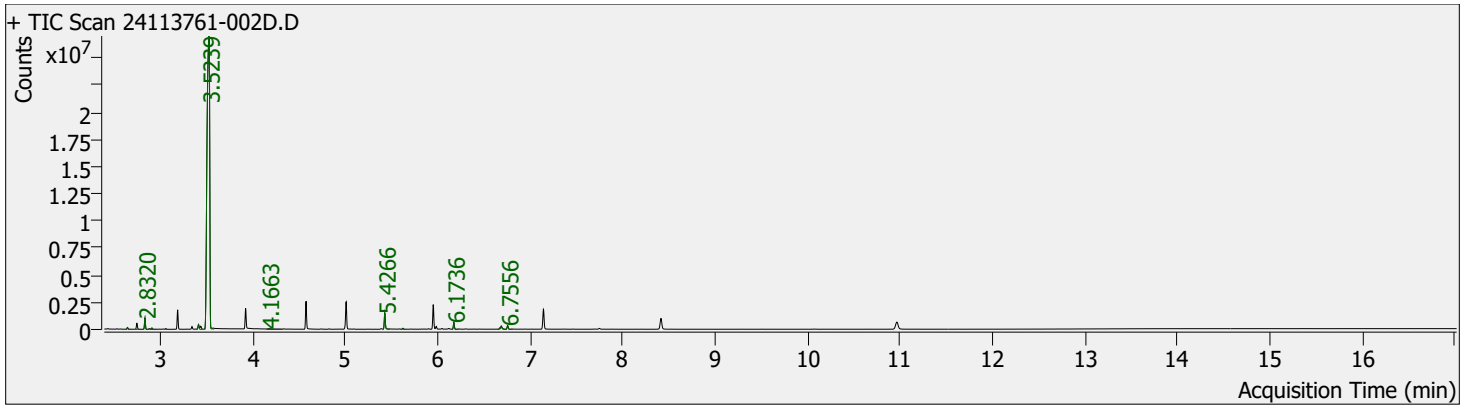
Sample Name: 24113761-002



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
None Detected				

SOCOTEC - SVOC Unknowns Analysis Report

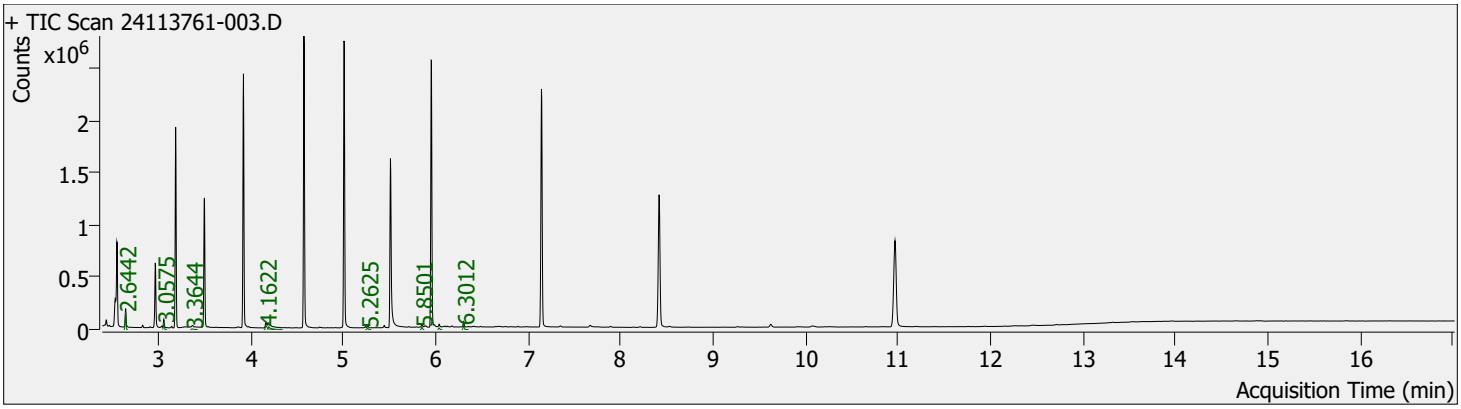
Sample Name: 24113761-002D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5239	Benzenamine, N,N-dimethyl-	98.3	121-69-7	2.61 mg/l
2.8320	Benzene, 1-fluoro-2-methoxy-	98.1	321-28-8	0.03 mg/l
3.4113	Aniline, N-methyl-	97.3	100-61-8	0.02 mg/l
5.4266	Benzene, 1,3,5-tribromo-2-methoxy-	98.0	607-99-8	0.01 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

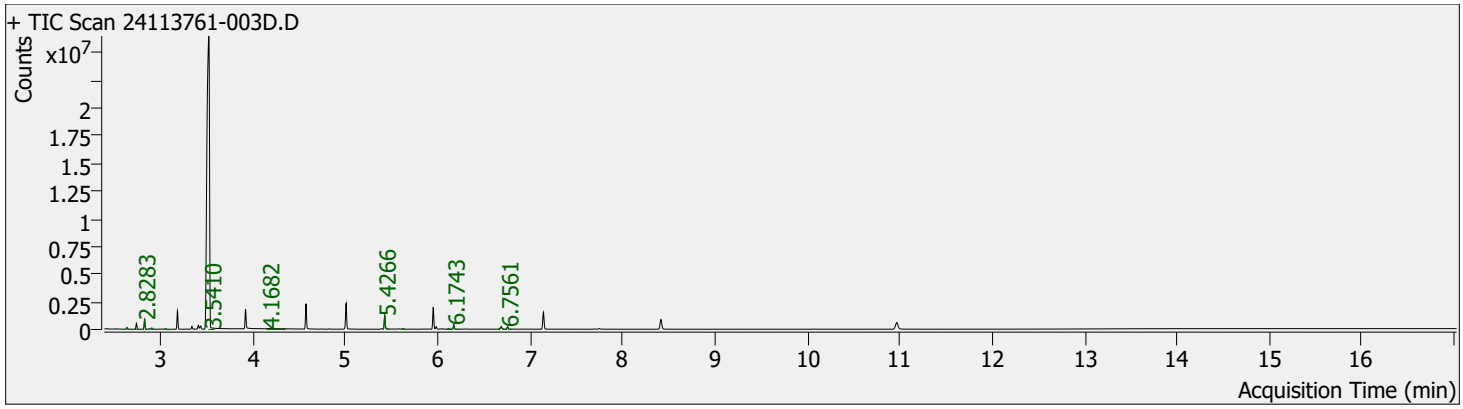
Sample Name: 24113761-003



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
None Detected				

SOCOTEC - SVOC Unknowns Analysis Report

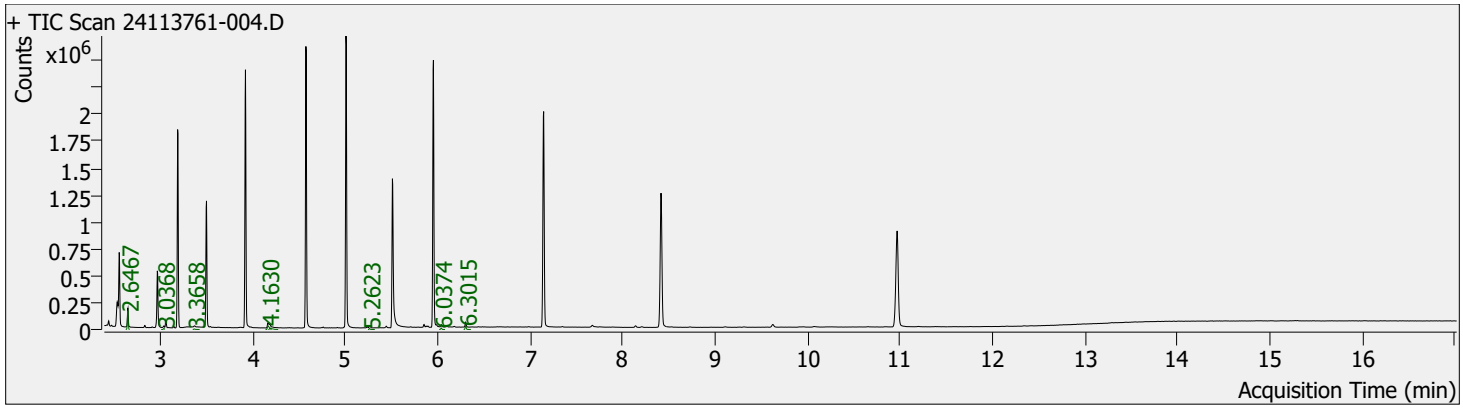
Sample Name: 24113761-003D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
2.8283	Benzene, 1-fluoro-2-methoxy-	98.0	321-28-8	0.03 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

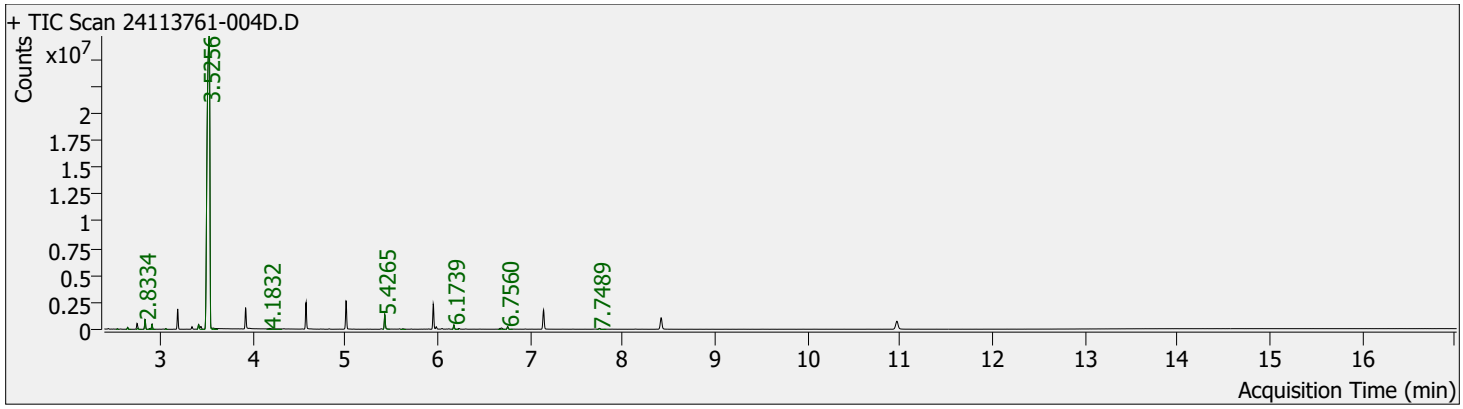
Sample Name: 24113761-004



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
None Detected				

SOCOTEC - SVOC Unknowns Analysis Report

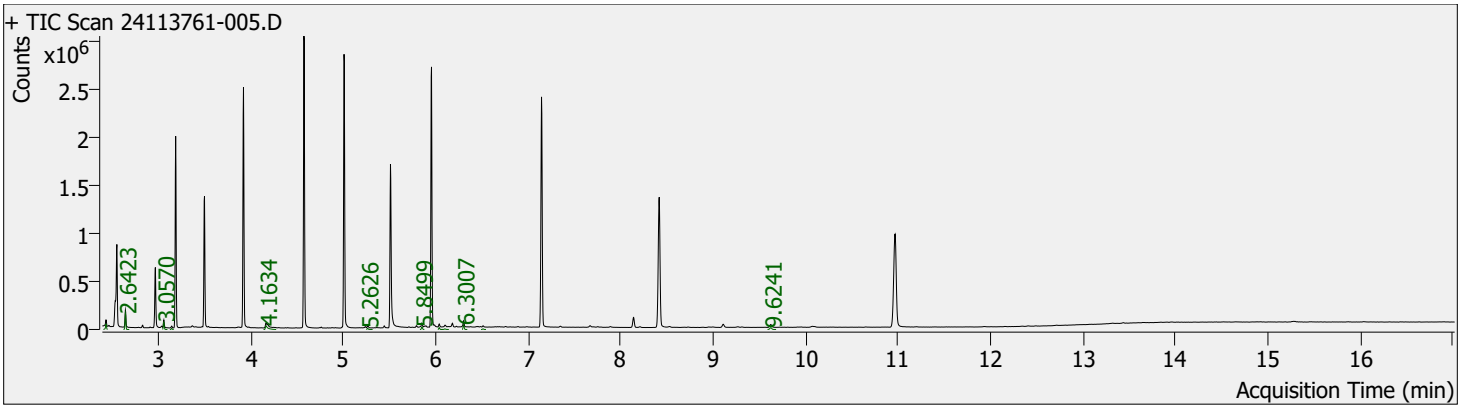
Sample Name: 24113761-004D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5256	Benzenamine, N,N-dimethyl-	98.1	121-69-7	2.69 mg/l
2.8334	Benzene, 1-fluoro-2-methoxy-	98.2	321-28-8	0.03 mg/l
2.9083	Cyclotetrasiloxane, octamethyl-	96.4	556-67-2	0.02 mg/l
3.4125	Aniline, N-methyl-	97.0	100-61-8	0.02 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

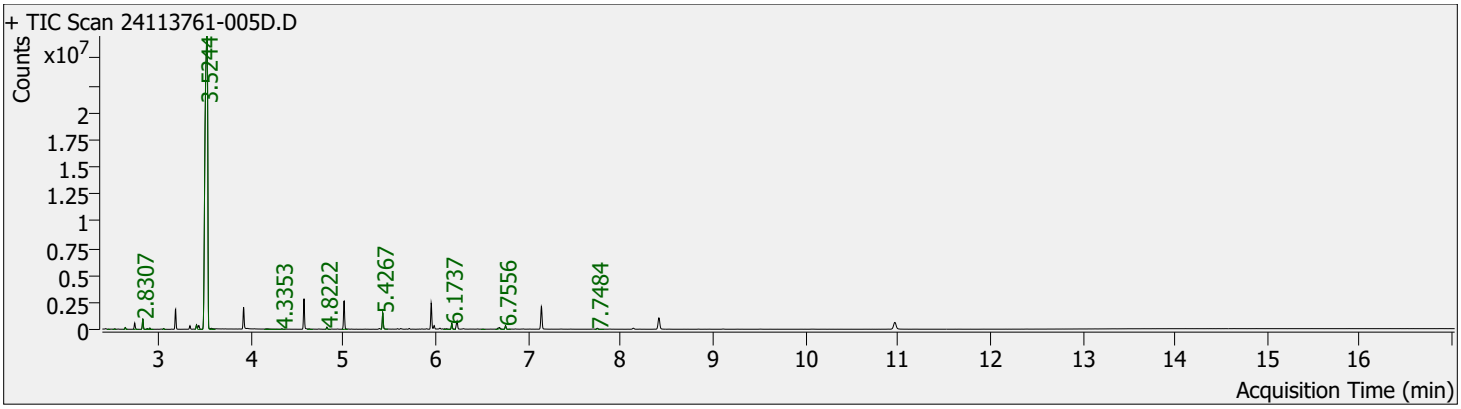
Sample Name: 24113761-005



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
	None Detected			

SOCOTEC - SVOC Unknowns Analysis Report

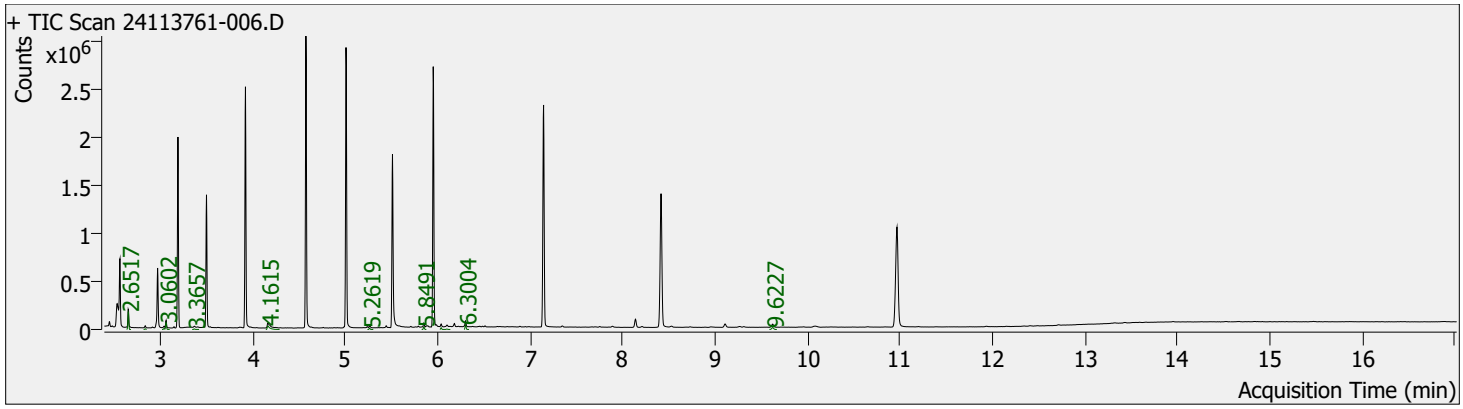
Sample Name: 24113761-005D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5244	Benzenamine, N,N-dimethyl-	98.3	121-69-7	2.69 mg/l
2.8307	Benzene, 1-fluoro-2-methoxy-	98.0	321-28-8	0.03 mg/l
3.4114	Aniline, N-methyl-	96.2	100-61-8	0.02 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

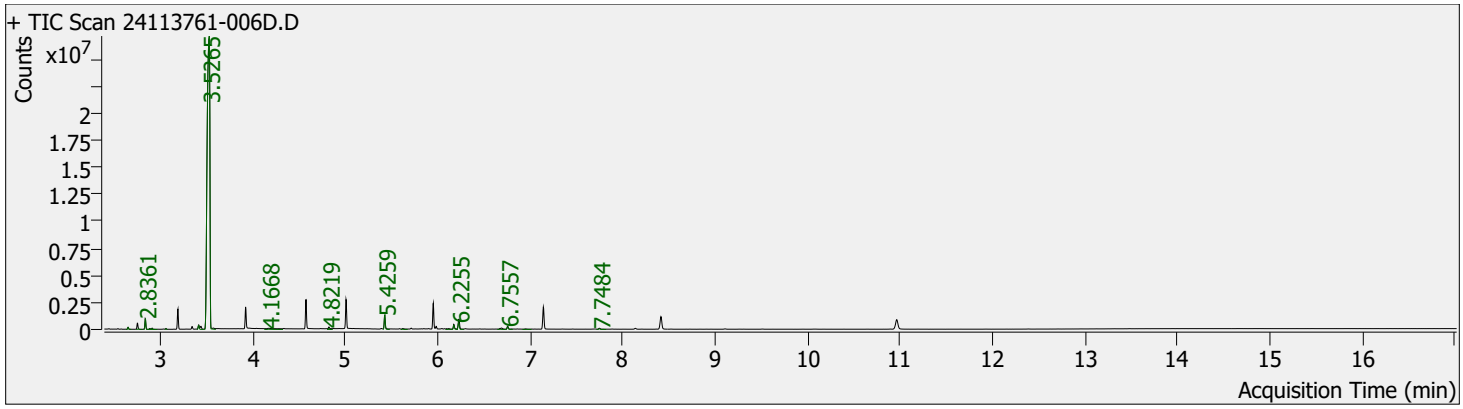
Sample Name: 24113761-006



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
	None Detected			

SOCOTEC - SVOC Unknowns Analysis Report

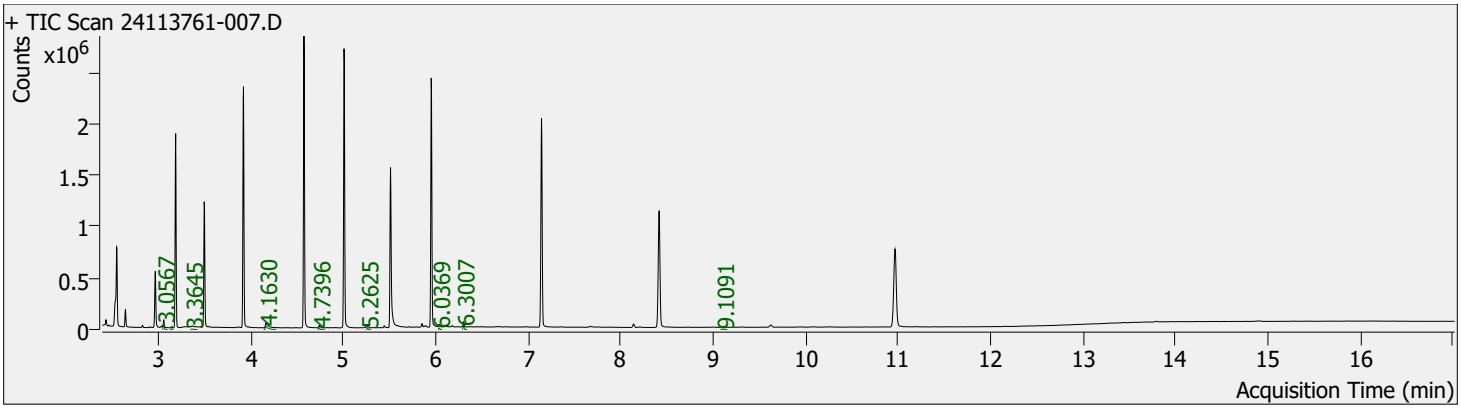
Sample Name: 24113761-006D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5265	Benzenamine, N,N-dimethyl-	98.3	121-69-7	2.64 mg/l
2.8361	Benzene, 1-fluoro-2-methoxy-	98.0	321-28-8	0.03 mg/l
3.4128	Aniline, N-methyl-	96.7	100-61-8	0.02 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

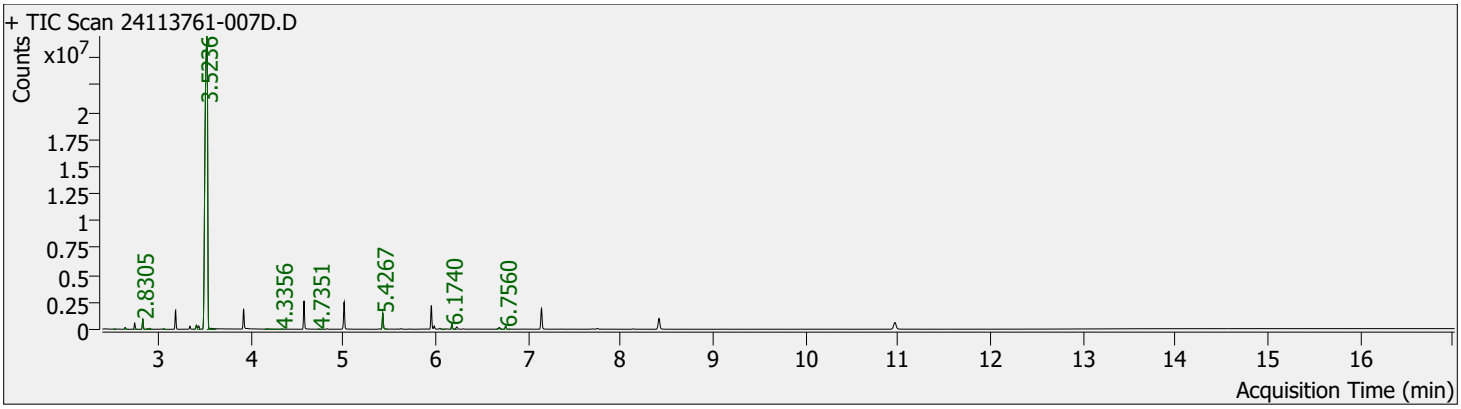
Sample Name: 24113761-007



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
	None Detected			

SOCOTEC - SVOC Unknowns Analysis Report

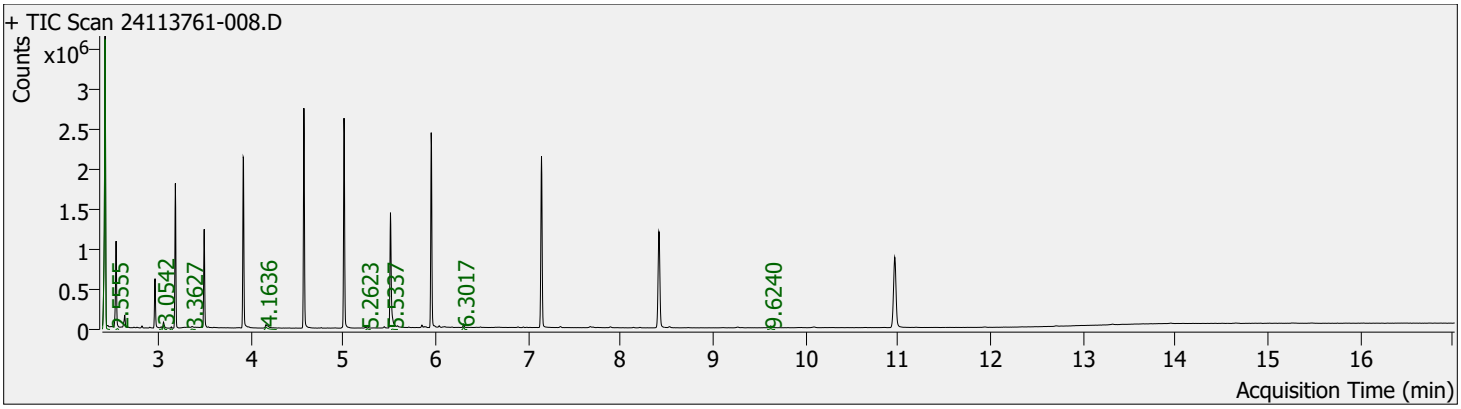
Sample Name: 24113761-007D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5236	Benzenamine, N,N-dimethyl-	98.3	121-69-7	2.56 mg/l
2.8305	Benzene, 1-fluoro-2-methoxy-	98.0	321-28-8	0.03 mg/l
3.4105	Aniline, N-methyl-	97.4	100-61-8	0.02 mg/l
5.4267	Benzene, 1,3,5-tribromo-2-methoxy-	97.8	607-99-8	0.01 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

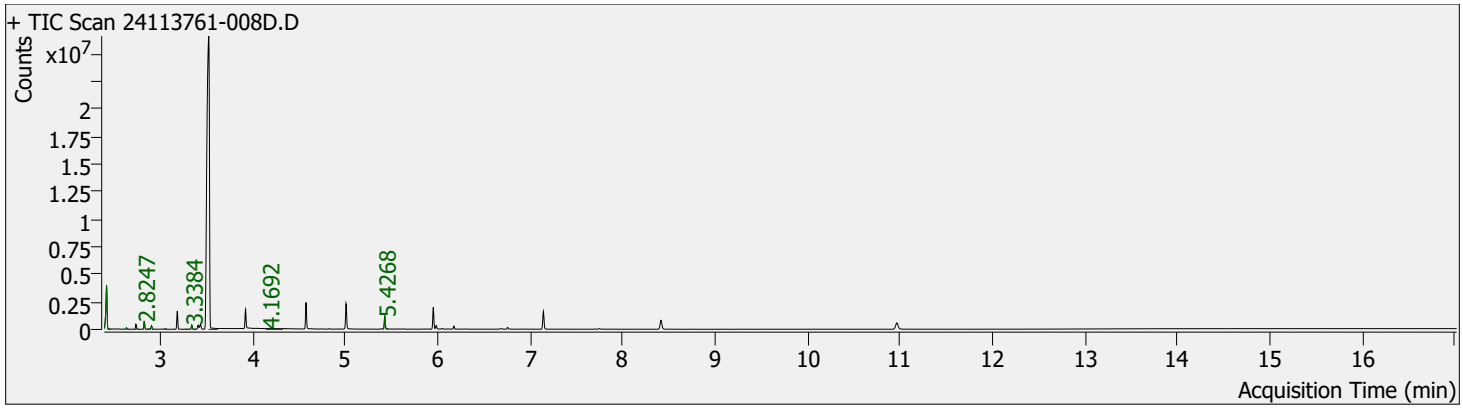
Sample Name: 24113761-008



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
None Detected				

SOCOTEC - SVOC Unknowns Analysis Report

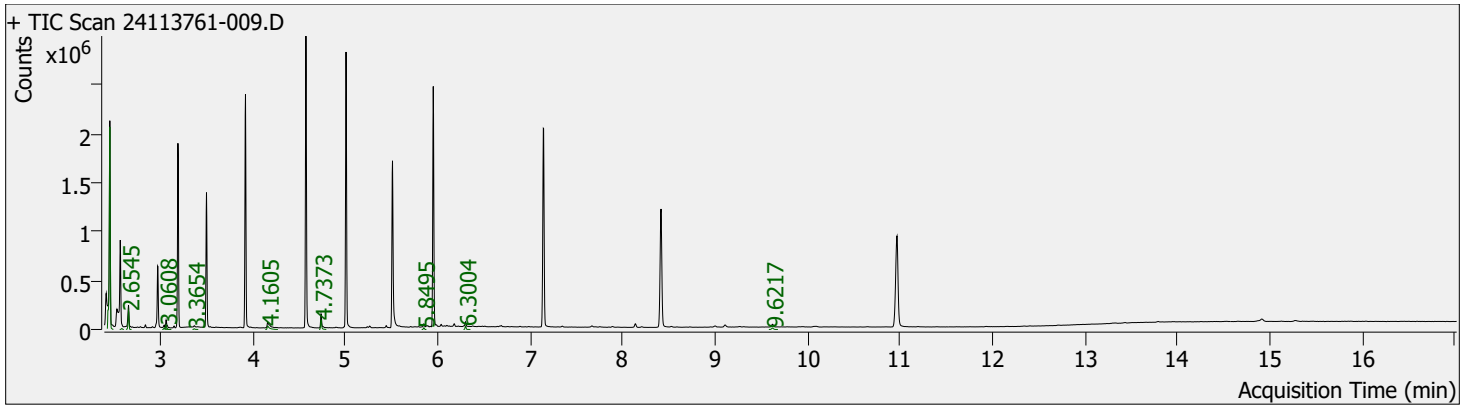
Sample Name: 24113761-008D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
2.8247	Benzene, 1-fluoro-2-methoxy-	97.8	321-28-8	0.11 mg/l
2.9034	Cyclotetrasiloxane, octamethyl-	95.5	556-67-2	0.08 mg/l

SOCOTEC - SVOC Unknowns Analysis Report

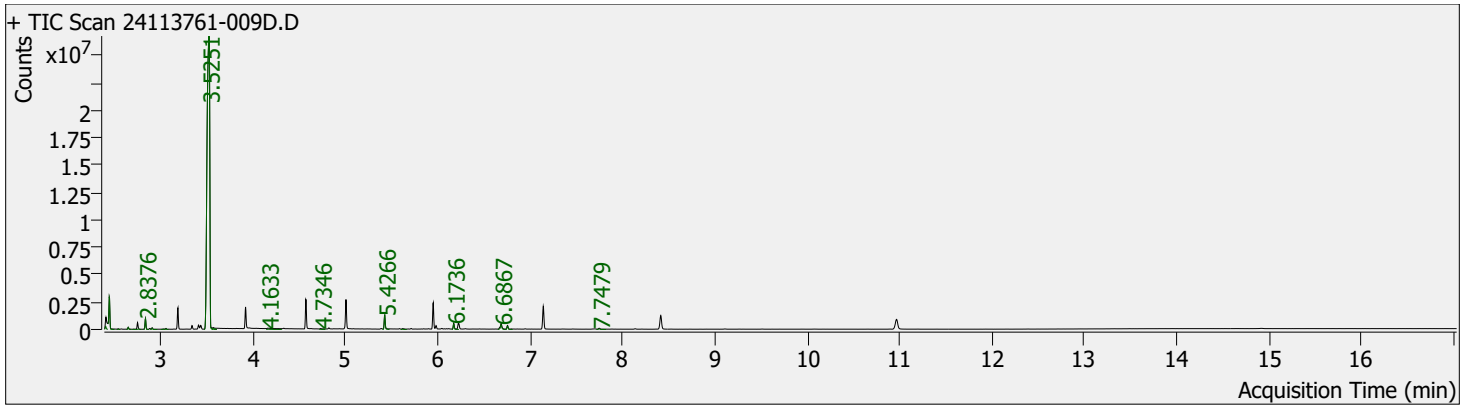
Sample Name: 24113761-009



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
None Detected				

SOCOTEC - SVOC Unknowns Analysis Report

Sample Name: 24113761-009D



Component RT	Compound Name	Match Score	CAS#	Estimated Concentration
3.5251	Benzenamine, N,N-dimethyl-	98.3	121-69-7	13.18 mg/l
2.8376	Benzene, 1-fluoro-2-methoxy-	97.3	321-28-8	0.15 mg/l

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

Deviating Sample Report

Sample Reference	Text ID	Method Code	Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
HAF_Discharge	24113761-001	**WSLM20**						✓
HAF_Discharge U/S	24113761-002	**WSLM20**						✓
HAF_Discharge D/S	24113761-003	**WSLM20**						✓
HAF_S1	24113761-004	**WSLM20**						✓
HAF_S2	24113761-005	**WSLM20**						✓
HAF_S3	24113761-006	**WSLM20**						✓
HAF_S4	24113761-007	**WSLM20**						✓
HAF_S5	24113761-008	**WSLM20**						✓
HAF_S6	24113761-009	**WSLM20**						✓

Analysis Method

Method Code	Method Description	Analysis Method
AHBLCMS	Acid Herbicides (Suite 1) by LC/MS/MS	Unfiltered
FTIRSWPER	TPH by FTIR	Unfiltered
ICPMSW (Dissolved)	Cadmium (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Chromium (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Copper (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Lead (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Mercury (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Nickel (Diss.) in Water by ICPMS	Filtered
ICPMSW (Dissolved)	Zinc (Diss.) in Water by ICPMS	Filtered
ICPWATVAR (Dissolved)	Aluminium (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Calcium (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Iron (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Magnesium (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Potassium (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Sodium (Diss.) in Water by ICPOES	Filtered
ICPWATVAR (Dissolved)	Total Sulphur as SO4 (Diss.) in Water	Filtered
OGSNMS	Organotins Suite (DBT, TBT, TPhT)	Unfiltered
PCBECD	PCBs, ICES 7 Congeners	Unfiltered
PESTSW-OCP	OCP: Organochlorine Pesticides by GCMS	Unfiltered
PESTSW-OPP	OPP: Organophosphorus Pesticides by GCMS	Unfiltered
PHCONDW	Electrical Conductivity @ 25°C	Unfiltered
PHCONDW	pH	Unfiltered
SFAPI	Cyanide (Total) by SFA	Unfiltered
SVOCSW	Broadscan (Derivatised) by GCMS	Unfiltered
SVOCSW	Broadscan (Underivatised) by GCMS	Unfiltered
TPHFID	TPH (>C8-C35) Carbon Banded plus (>C8-40) Total	Unfiltered
VOCHSAW	VOCs (Target List) by GCMS	Unfiltered
WSLM10	TSS: Total Suspended Solids	Unfiltered
WSLM20	BOD: Biological Oxygen Demand (Total)	Unfiltered
WSLM30	Turbidity	Unfiltered

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

Result Report Notes

Letters alongside results signify that the result has associated report notes.
The report notes are as follows:

Letter	Note
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total

Project Number: 24113761

Client: Tarmac Ltd
Date Issued: 11/12/2024
Project Name: Scheduled Samples 12-2024 - Hafod December

Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

U = UKAS accredited analysis
M = MCERT accredited analysis
N = Unaccredited analysis

Any accreditation marked with ^ signify results are reported on a dry weight basis of 105 ° C.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° C.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any results marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis
NA = Sample is not amenable for the required analysis
ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by another SOCOTEC department or by an external subcontracted laboratory. Further information is available upon request.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis