

Site: TWMA Peterhead (Dales Unit 12 Dales Industrial Estate, Peterhead AB42 3JR)
 Permit Reference: 6.2.8 PPC/A/1000175 VAR 01
 Date: 08/05/24
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Introduction

In line with Permit condition 6.2.8 of Variation notice VAR01, this document outlines the monitoring plan and associated methodologies to undertake the systematic emissions sewer assessment in 2024. This document outlines the methods by which ELVs shall be established in reference to table 6.2 of VAR01 (shown below).

Table 6.2 - Emissions to Sewer ELVs

Source of Emission	Emission number point	W01
	Source of Emission	Recovered water
	Destination	Sewer
	Emission location	NK 11022 44771
Limits For Parameters for Emission to Source	Sampling location	Effluent interceptor sampling point
	Hydrocarbon oil index (HOI)	No limit set
	Free cyanide (CN ⁻)	No limit set
	Adsorbable organically bound halogens (AOX)	No limit set
	Arsenic (expressed as As)	No limit set
	Cadmium (expressed as Cd)	No limit set
	Chromium (expressed as Cr)	No limit set
	Hexavalent chromium (expressed as Cr(VI))	No limit set
	Copper (expressed as Cu)	No limit set
	Lead (expressed as Pb)	No limit set
	Nickel (expressed as Ni)	No limit set
	Mercury (expressed as Hg)	No limit set
	Zinc (expressed as Zn)	No limit set

The emission and sampling location are the same point as marked "A" in the site layout extracted from our Trade Effluent Consent with Scottish Water in appendix 5.

An overview of the site processes and subsequent discharge to sewer is provided in appendix 1. Water recovered from the waste on site is batch treated via dissolved air floatation (DAF). If testing deems this treated water is not within the limits set under our Trade Effluent Consent (TEC) with Scottish water (Reference 4140a), then it is diverted to a storage tank for a second batch treatment through the DAF. If treated water is compliant with our TEC limits, it is discharged from site via municipal sewer to Burnhaven waste water treatment plant which subsequently discharges into Sandford Bay. A copy of our current (as of 02/11/23) 12 Month Rolling Sample compliance is provided in Appendix 4 (98.42%).

This document reviews the additional requirements outlined in Table 6.2 of VAR01. Existing monitoring in place to satisfy condition 6.2.4 of the permit remains in place and is not affected by the additional monitoring outlined in this document. A summary of the most recent mass emission report for 2022 is included in Appendix 2 for information.

All drains on-site are colour coded for identification purposes as follows:

- Blue – surface water system
- Red – foul water system
- Yellow – sumps, unconnected to any drainage system

A copy of the poster used on site to communicate the above is provided in Appendix 3.

BAT 3 Site Inventory

The inventory below should be read in conjunction with site process over view in appendix 1.

Inventory of wastes accepted

Thermomechanical treatment

01 05	drilling muds and other drilling wastes
01 05 04	freshwater drilling muds and wastes
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing dangerous substances
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06 (none received in 2022)
01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06 (none received in 2022)
01 05 99	wastes not otherwise specified
05 01	wastes from petroleum refining
05 01 03*	tank bottom sludges
05 01 05*	oil spills
05 01 06*	oily sludges from maintenance operations of the plant or equipment
13 05	oil/water separator contents
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
19 02	wastes from physico/chemical treatments of waste (including dechromation, decyanation, neutralisation)
19 02 05*	sludges from physico/chemical treatment containing hazardous substances

Physicochemical treatment

13 04	bilge oils
13 04 01*	bilge oils from inland navigation
13 04 02*	bilge oils from jetty sewers
13 04 03*	bilge oils from other navigation
13 05	oil/water separator contents
13 05 06*	oil from oil/water separators
13 05 07*	oily water from oil/water separators
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
16 07	wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)
16 07 08*	wastes containing oil
19 02	wastes from physico/chemical treatments of waste (including dechromation, decyanation, neutralisation)
19 02 07*	oil and concentrates from separation
19 11	wastes from oil regeneration
19 11 03*	aqueous liquid wastes

In 2023, a total of 17860 tonnes was processed through the site RotoMill (thermomechanical treatment) and 22250 tonnes processed through the slops treatment plant (physicochemical treatment). The maximum capacity of the RotoMill is 36,500mt (100mt per day) and maximum capacity of slop plant is 32,850mt (90mt per day).

The site is predominantly an open yard, therefore a proportion of the water discharged to sewer is rainwater from the process areas. Discharge from the treatment process is during daytime hours under supervision of laboratory staff who test the effluent post DAF treatment to ensure the effluent remains compliant with consent limits. The discharge valve is locked out of hours. In 2023 31287 M³ water was discharged to foul sewer and 52 composite samples were tested by Scottish Water for the following: BOD, chloride, COD, copper, mineral oil, sulphate, suspended solids and zinc. Composite and grab samples are tested by onsite laboratory staff every operational day (the site is closed for a few days over Christmas and again at New Year) and effluent is monitored and tested whilst discharging post DAF treatment. Although the site operates 24/7, discharge is undertaken during daytime hours under supervision of laboratory staff. In January 2024, daily flows discharged averaged 83M³, with a portion of this being rainwater.

TWMA's environmental management system (EMS) is certified to ISO 14001:2015. We are audited by an external 3rd party, UKAS accredited body against the International Standard of Environmental Management Systems, ISO 14001:2015. All BATc 1 requirements are mirrored in the requirements of the ISO Standard. Certification to the standard is granted on 3-yearly cycles and over the cycle, all elements of the EMS are covered and an in-depth, re-certification

audit takes place every 3 years. The validity of our certification can be verified on [British Standards Institute website](#).

All waste is booked in prior to arrival on site. Waste acceptance procedures are in place to ensure waste is compatible with the treatment processes on site. (TWMA-0388-PRO Receipt, handling and storage of cuttings & TWMA-2012-PRO Slops acceptance, pre analysis, storage and discharge). Both procedures document the acceptance, sampling, analysis and recording of the waste and the results prior to treatment. Non-conforming wastes are either rejected or quarantined.

A requirement of the ISO standard is to maintain an annual internal audit schedule, the schedule, subsequent internal reports and corrective actions are then in turn subject to external audit as part of certification to the standard. (BATc 1 V). Management System Review is conducted annually to evaluate the effectiveness of the management system, the inputs and outputs from the review are subject to external audit under certification to ISO 14001 (BAT 1c VI).

Incidents are managed within TWMA's CORE system, an incident report is raised and automatically assigned a unique number for tracking. Corrective actions are assigned within the same system, linked to the original incident and each with their own unique number. The CORE system is subject to external auditing by 3rd party as required under ISO standard. Any improvements that are identified can also be raised and tracked through the CORE system facilitating continual improvement, a key element within the ISO standard, which covers all the requirements of BAT 1, Environmental Management System.

RotoMill Process (Thermomechanical treatment)

Stage 1: Cuttings are received in offshore bins and unloaded using a forklift truck. These are then stacked until they are emptied through a mixture of forklift truck rotation and manual scraping into a receiving hopper.

Stage 2 of the process is to mobilise the cuttings from the hopper to a CST (Cuttings storage and transfer) unit via a shaker and magnet to remove large solids and metals which could block feed lines or damage the mill.

Stage 3 of the process is to transfer the cuttings from the feed skid into the mill body. This is achieved by a computer controlled hydraulic pump.

Stage 4 of the process is the thermo mechanical desorption within the mill body of the TCC RotoMill itself. Here the temperature of the mill is maintained at ~240°C by the frictional energy of the mill grinding the solids that make up the cuttings. The liquid fraction flash evaporates upon entering the mill and exits via a cyclone whilst the solids exit through a series of rotary valves.

The composition of the cuttings fed to the process unit are balanced from the receiving/mixing tanks to provide as consistent a feed as possible. Incoming material is tested to determine volumetric composition of the feed stock.

Stage 5 of the process relates to the storage of the recovered materials prior to removal from the facility.

Recovered water from the separator tank is pumped into a storage tank and treated using DAF (Dissolved air flotation) unit prior to discharge into the foul water system. This process is monitored, measured and adjusted to ensure compliance with discharge limits.

Recovered powder from the process is blown using compressed air into the powder silo which cools the recovered powder before it is bagged and tied for removal.

Recovered oil from the oil condenser is then transferred to the recovered oil tank in the tank farm and from there is processed through the evaporator. The fuel oil produced from this process is either used onsite or sold as a product, as per approval from HMRC and SEPA.

Oily Slops Treatment (physicochemical treatment)

Stage 1 of the oily slops process is reception and storage. Once slops are received at the facility they are directed into one of the dedicated oily slops storage tanks via the single manifold and ring main prior to transfer into Boiler Tank 1 for heating.

Stage 2 of the process is the heating of the slops prior to the separation treatment within the centrifuge itself.

Stage 3 of the process involves the separation of the slops mixture into oil, water and solids. This is achieved through two steps, a mechanical separation through a two stage decanting centrifuge into solids and liquids followed by gravitational separation into oil, water and residual slops.

Stage 4 of the process involves the solids from the process being further processed along with oil based mud cuttings in the RotoMill process. The water fraction from the process is then transferred to the slops water tanks for subsequent treatment by DAF. The recovered oil fraction from the process is then transferred to the evaporator. The fuel oil produced in this process is either used onsite or sold as a product, as per approval from HMRC and SEPA.

BRef Review

In May 2023, a variation to our permit was issued following review of the [Waste treatment BRefs](#) and [Waste treatment BAT conclusions](#).

As part of this review, the following information was collated and compared to BAT 7 and BAT 20. [SEPA Interpretational Guidance on the Best Available Techniques \(BAT\) Conclusions for Waste Treatment](#) and [SEPA Guidance WAT-SG-53](#) have been consulted in the preparation of this plan.

Waste Water Inventory

Guidance from the [Environment Agency](#) for sites treating waste containing oil, provides a list of expected emissions to water:

Benzene
 Ethylbenzene
 Toluene
 Xylenes
 Phenols
 PAHs
 Arsenic
 Cadmium
 Chromium
 Copper
 Lead
 Nickel
 Zinc
 Total nitrogen
 Total phosphorus
 TOC
 Chloride

This list is discussed in the following table, references to footnotes are those beneath the table in BAT 7.

Substance / Parameter	Current test frequency	BAT requirement	Further comment	Required to test?
Adsorbable organically bound halogens (AOX)	~	Once every day Footnotes 1,2,3 & 4 apply	AOX is not a requirement under our TEC with Scottish Water. This substance is not relevant in our waste water (see previous section inventory of wastes) AOX is relevant to the effluent streams of bleaching plants associated with the pulp and paper sector or in WWTP utilising chlorine in treatment regime. Neither of these apply to Peterhead site.	No

Benzene, toluene, ethylbenzene, xylene (BTEX)	~	Once every month Footnotes 1,2,3 & 4 apply	BTEX is not a requirement under our TEC with Scottish Water. BTEX are relevant to the waste water inventory. Footnote 1 applies – monitoring frequency may be reduced if the emission levels are proven to be sufficiently stable. Footnote 3 monitoring applies when the substance is identified as relevant in the waste water inventory.	Yes
COD	Daily / every batch	Once every day Footnotes 1,2,5 & 6 apply	Currently a requirement under TEC with Scottish Water and tested daily.	Yes
Free cyanide (CN-)	~	Once every day Footnotes 1,2,3 & 4 apply	Free cyanide is not a requirement under TEC with Scottish Water. Footnote 3 states monitoring required when substance is identified as relevant in the waste water inventory – this does not appear in the waste water inventory, however we can implement short term monitoring using rapid test methods to verify.	Yes
Hydrocarbon oil Index (HOI)	Daily / every batch	Once every day Footnotes 1,2 & 4 apply	Currently a requirement under TEC with Scottish Water.	Yes

Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Zinc	Copper and Zinc tested daily / every batch	Once every month Footnotes 1,2,3 & 4 apply	Copper and zinc limits are within the TEC with Scottish Water. The site is compliant with the TEC. Arsenic, cadmium, chromium, nickel and lead are not currently tested for.	Copper and zinc will continue to be monitored externally and reported annually as per PPC Permit condition 6.2.9 and we can implement monthly external testing in the short term to determine typical levels. Arsenic, cadmium, chromium, nickel and lead are relevant to the waste water inventory. We can implement external monthly testing in the short term to determine typical levels.
Manganese	~	Once every day Footnotes 1,2,3 & 4 apply	Footnote 3 states monitoring required when substance is identified as relevant in the waste water inventory – this does not appear in the waste water inventory, therefore not relevant.	No
Hexavalent chromium	~	Once every day Footnotes 1,2,3 & 4 apply	Footnote 3 states monitoring required when substance is identified as relevant in the waste water inventory – this does not appear in the waste water inventory, however we can implement short term monitoring	Yes

			using rapid test methods to verify.	
Mercury	~	Once every month Footnotes 1,2,3 & 4 apply	Footnote 3 states monitoring required when substance is identified as relevant in the waste water inventory – this does not appear in the waste water inventory, however we can implement short term, external, monthly testing to verify.	Yes
PFOA PFOS	~	Once every six months Footnotes 1,2 & 3 apply	PFOA & PFOS are not required under TEC with Scottish Water. In consideration of footnote 3, these substances are not relevant to the types of waste treated at Peterhead. Both are forms of surfactants related to use in textile industries.	PFOA and PFOS are not relevant to the waste inventory listed previously. These would be relevant in the papermaking industry (commonly added to food packaging grades for water repellent properties). Testing of these substances would also be relevant in textile industries where added to achieve technical specification. Where added, the exact species of PFOA and PFOS could be tested for, as these descriptions cover a wide range of chemical entities it would be unreasonable for Peterhead to undertake testing for these substances

				where not relevant to the process.
Phenol Index Total nitrogen Total organic carbon Total phosphorus	~	Once every month Footnotes 1,2 & 6 apply to all (with footnote 5 applying to TOC)	None of these substances are required under TEC with Scottish Water. In consideration of footnote 6, monitoring only applies in the case of a direct discharge to a receiving water body. Discharge is via municipal WWTP, however short term, monthly, external testing of these parameters can be undertaken to determine typical levels. (with the exception of TOC as COD is already tested daily as a requirement for TEC)	Yes (with exception of TOC)
Total suspended solids	Daily / every batch	Once every month Footnotes 1, 2 & 6 apply	This is a requirement under TEC with Scottish Water.	Yes, will continue to monitor as per TEC

In preparation for the additional monitoring required, TWMA sought quotes for the external testing of the following parameters as we are unable to perform these in internal laboratory on site:

Free cyanide
Arsenic
Cadmium
Chromium
Hexavalent Chromium
Lead
Nickel
Mercury

TPH is measured daily in internal laboratory which we believe to be an equivalent scientific quality as Hydrocarbon oil index and this test frequency will continue. Zinc and copper mass emissions are currently calculated using test results from external testing by Scottish Water and TWMA can measure both [copper](#) and [zinc](#) in internal laboratory using cuvette test kits.

COD, chloride and suspended solids are already tested daily in internal laboratory as required under TEC and have been included in this plan for completeness.

We do not have external laboratory testing set up to measure adsorbable organically bound halogens (AOX) as we do not believe this is relevant to neither our waste stream nor our onsite treatment process. AOX is relevant to the effluent streams of bleaching plants associated with the pulp and paper sector or in WWTP with an activated sludge stage which utilises chlorine based substances for bacterial control. Neither of these apply to Peterhead site. However if it necessary to include this, then we can make enquiries with external laboratories.

Therefore in order to gather the necessary data to establish ELVs and long term monitoring frequencies, the following table details the short-term monitoring plan and available methodologies proposed. For the tests to be carried out in external laboratory, the reporting limits as determined by the laboratory are provided in the “Method Description” column. For further explanation from the laboratory on the relationship between reporting limits and limits of detection please see [here](#). Where testing is carried out in the internal laboratory, the limit within the trade effluent consent is provided in the “Method Description” for indication of range.

Emissions to sewer at point W01 (grid reference NK 110022 44771), Effluent interceptor sampling point:

Parameter	Frequency	Method Description
Benzene	Monthly (composite)	GEO56 BTEX in water by GCMS (MCERTS) reporting limit 0.1µg/l in external laboratory
Ethyl Benzene o-Xylene Toluene	Monthly (composite)	GEO56 BTEX in water by GCMS (UKAS / ISO17025 Accredited) reporting limit 0.1µg/l in external laboratory
PAHs (16)	Monthly (composite)	GEO81 PAH (EPA) (UKAS / ISO17025 Accredited) 0.01µg/l in external laboratory
Arsenic (expressed as As)	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.00024 mg/l in external laboratory
Cadmium (expressed as Cd)	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.00007 mg/l in external laboratory
Chromium, total as Cr	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.00051mg/l in external laboratory
Hexavalent chromium (expressed as Cr(VI))	Daily (Monday to Friday composite)	rapid test methods
Copper (expressed as Cu)	Daily (Monday to Friday composite)	Cuvette test kit internally (corroborated by external Scottish Water testing) Effluent consent limit 2mg/l

Lead (expressed as Pb)	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.0003 mg/l in external laboratory
Nickel (expressed as Ni)	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.001 mg/l in external laboratory
Zinc (expressed as Zn)	Monthly (composite)	Cuvette test kit internally (corroborated by external Scottish Water testing) Effluent consent limit 2mg/l
Phenols Mono (Phenol Index)	Monthly (composite)	WAS019 Monohydric Phenol in Water by Colorimetry (MCERTS) reporting limit 0.1 mg/l in external laboratory
Nitrogen, Total as N	Monthly (composite)	WAS022 Nitrogen in Water by colorimetry (MCERTS) reporting limit 0.5mg/l in external laboratory
Phosphorus, total as P	Monthly (composite)	WAS076 ICPMS Metals (MCERTS) reporting limit 0.012mg/l in external laboratory
COD	Daily / every batch	Rapid test method as currently undertaken in internal laboratory. Effluent consent limit 15000mg/l (corroborated by external Scottish Water testing)
Chloride	Daily / every batch	Rapid test method as currently undertaken in internal laboratory. Effluent consent limit 20000mg/l (corroborated by external Scottish Water testing)
Free Cyanide (CN-)	Daily (Monday – Friday composite)	rapid test methods
Hydrocarbon oil index (HOI)	Daily (grab and composite)	TPH (Blue Book Method) as currently undertaken in internal laboratory. Effluent consent limit 200mg/l
Mercury (expressed as Hg)	Monthly (composite)	WAS013 Mercury in Water by CV-AFS (MCERTS) reporting limit 0.00001 mg/l in external laboratory
Total Suspended Solids (TSS)	Daily / every batch	TSS (Based on Blue Book Method) as currently undertaken in internal laboratory. Effluent consent limit 1000mg/l (corroborated by external laboratory testing)

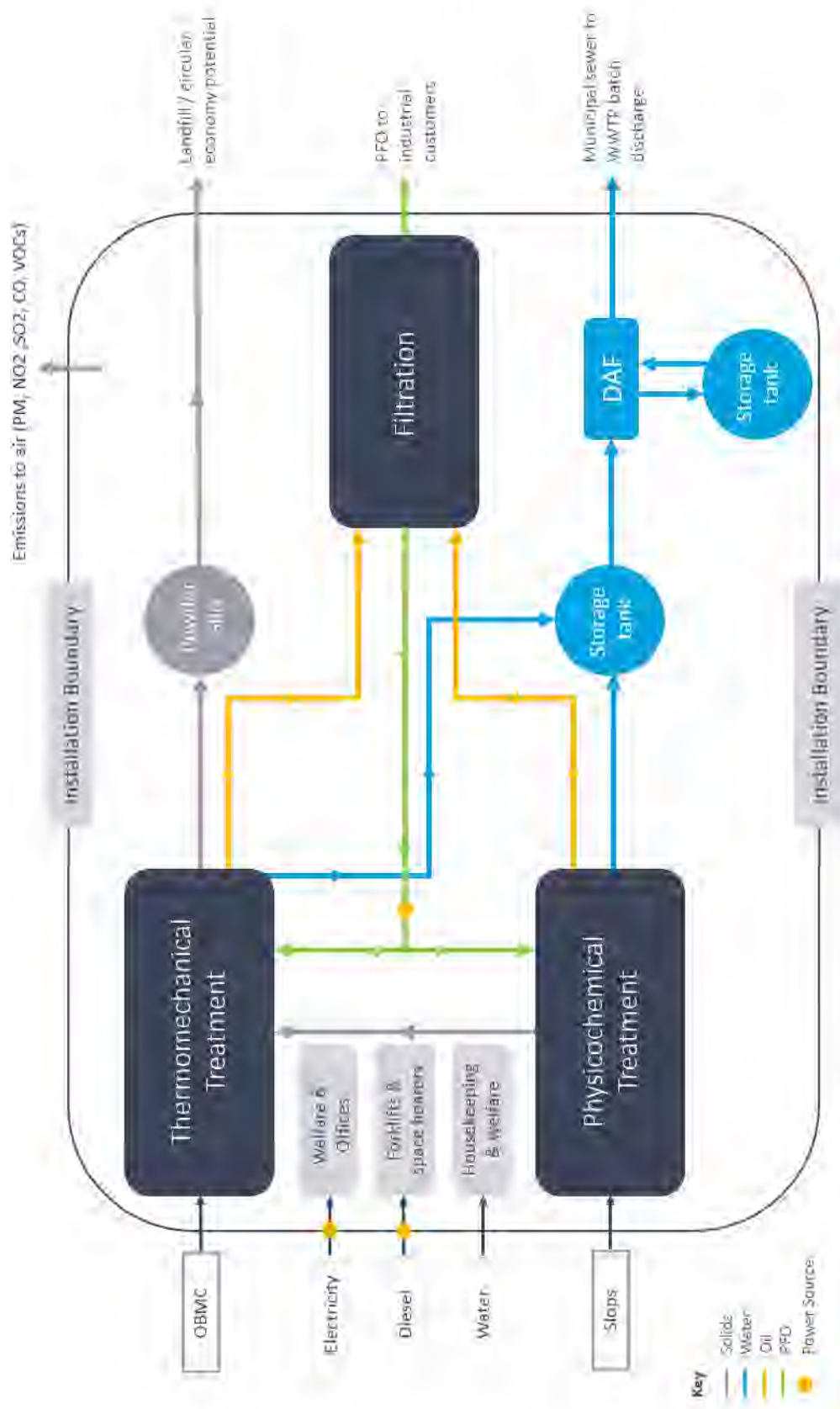
Scottish Water continually review the results of the tests they undertake on our discharges and assign a rolling compliance rating, a screenshot of this assessment is provided in appendix 4. Discharge from site is only undertaken under supervision of laboratory staff during daytime hours (including Saturday and Sunday) and the effluent is sampled and tested throughout the discharge period to ensure compliance with trade effluent consent.

For the additional testing proposed in the table above to be undertaken by external laboratory, after 3 year of testing, the results will be collated and reviewed against BAT-AELs referenced in Table 6.2 BAT 20, where these are applicable to our site. The data will be assessed for stability for each monitoring parameter. The assessment will also consider the tonnages of waste processed on site to ensure the period is representative of typical processing and if so, this dataset will establish a baseline for the site.

Throughout the first year of additional monitoring, we will liaise with Scottish Water to satisfy ourselves that the treatment provided off-site is BAT in accordance with Interpretational Guidance on BAT and discuss this demonstration with SEPA.

The data collated will provide evidence of the levels of relevant emissions to sewer which will inform ELVs for the Peterhead site and upon input from Scottish Water and review with SEPA will determine any adjustments deemed necessary to the monitoring frequencies of this plan.

Appendix 1



Appendix 2

PPC/A/1000175 - Condition 6.2.9, Mass Emissions to Sewer 2022



Measured Foul Water Volume Discharged in 2022 (m3)	22710
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Parameter	Average Concentration (mg/l)*	Mass Emission (Annual kg)	Data Source	Analysed by	No. of Samples
BOD	2587	58752	Concentration from composite sample	Scottish Water	48
Chloride	9794	222425	Concentration from composite sample	TWMA & Scottish Water	349
COD	8723	198102	Concentration from composite sample	TWMA & Scottish Water	348
Copper	0	4	Concentration from composite sample	Scottish Water	48
Mineral Oil	92	2089	Concentration from composite sample	TWMA & Scottish Water	331
Sulphate	356	8085	Concentration from composite sample	Scottish Water	48
Suspended Solids	377	8562	Concentration from composite sample	TWMA & Scottish Water	343
Zinc	0.35	8	Concentration from composite sample	Scottish Water	47

*where data was reported as lower than a reportable limit, the limit was used to calculate the average

Appendix 3



COLOUR CODING OF DRAINS AT PETERHEAD:

Blue
• Uncontaminated rainwater
• No water from bunds
• Surface water is discharged to Burn. No treatment

Green
• Processed water from site
• Bund water
• REMEMBER all discharges to foul water system must be tested before being discharged

Red
• Sumps are not connected to any drainage system
• Sumps require to be emptied either by pump or vacuum tanker

If in doubt please contact the Site Manager

Trade Effluent Compliance

Appendix 5

