

bluewater

**OSPAR Public Statement 2019
Environmental Performance**



Issue Date: 1st June 2020

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1. INTRODUCTION

Under Recommendation 2003/5 of the Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic [OSPAR], the Offshore Petroleum Regulator for Environment and Decommissioning [OPRED] requires that all companies operating in the United Kingdom Continental Shelf [UKCS] have systems and procedures in place to identify, monitor and control the environmental aspects associated with offshore activities.

This document details the 2019 OSPAR Public Statement for Bluewater Energy Services B.V. (hereinafter referred to as Bluewater) and reports the environmental performance of a) the Pierce Field operations and activities during 2019, and b) the Lancaster Field operations and activities during 2019, in line with the requirements of OSPAR Recommendation 2003/5. The scope focuses on the two offshore assets, the Hæwene Brim Floating Production Storage and Offloading [FPSO] and the Aoka Mizu FPSO.

2. OVERVIEW OF OPERATIONS

Pierce Field Offshore Activities

The Pierce development is located in Blocks 23/22a and 23/27a of the Central North Sea [CNS]. The development is served by a FPSO facility, the Hæwene Brim (Figure 2-1). The Hæwene Brim FPSO is located at 57° 09' 38.834" N, 02° 17' 35.130" E which is 247.5 km from the United Kingdom [UK] coastline, 2.6 km from the UK/Norwegian median line and in a water depth of approximately 85 m. On behalf of Shell UK Ltd, Enterprise Oil plc is the field operator in conjunction with joint venture partner Ithaca Energy UK Limited. Pierce Production Company Limited [PPCL] serve as the installation operator of the Hæwene Brim FPSO.



Figure 2-1 The Hæwene Brim FPSO

The Hæwene Brim FPSO's main functions are:

- Receipt of fluids from subsea wells;
- Control of the subsea wells;
- Processing of the incoming fluids for separation into crude, water and gas;
- Storage of the stabilised crude oil and maintaining it at the required temperature;
- Treatment of effluent for discharge of water to the sea;
- Chemical injection;
- Produced gas re-injection;
- Offloading of crude into tandem moored shuttle tankers;
- Power generation for process, gas compression, offloading, utilities and ship systems; and
- Provision of accommodation for operating and maintenance personnel.

Operational activities during 2019 included normal production operations, maintenance and well optimisation work.

Lancaster Field Offshore Activities

The Lancaster field is located in Block 205/21a of the UK Continental Shelf (UKCS) to the west of the Shetland Islands. The development is served by the Aoka Mizu FPSO (Figure 2-2).

The Aoka Mizu FPSO arrived on location on the 19th March 2019. The Aoka Mizu FPSO is located at 60° 10' 49.82" N, 03° 52' 5.16" W which is 98 km from the UK coastline, 54 km from the UK/Faeroes median line and in a water depth of approximately 158 m. Hurricane Energy PLC (hereinafter referred to as Hurricane) is the licence operator for the Lancaster field. Bluewater Lancaster Production [UK] Ltd are the formally appointed Installation Operator of the Aoka Mizu FPSO.



Figure 2-2 The Aoka Mizu FPSO

The Aoka Mizu FPSO's main functions are:

- Receipt of fluids from subsea wells;
- Control of the subsea wells;
- Processing of the incoming fluids for separation into crude, water and gas;
- Storage of the stabilised crude oil and maintaining it at the required temperature;
- Treatment of effluent for discharge of water to the sea;
- Chemical injection;
- Offloading of crude into tandem moored shuttle tankers;
- Power generation for process, gas compression, offloading, utilities and ship systems; and
- Provide accommodation for operating and maintenance personnel.

Oil production commenced on the 11th May 2019. Once the initial start-up of production was completed, operational activities during 2019 included normal production operations, maintenance and well optimisation work.

3. SAFETY AND ENVIRONMENTAL (SEMS) MANAGEMENT SYSTEM

Bluewater Health, Safety, Environmental and Quality [HSEQ] Policy

Bluewater Services [UK] Ltd adopts the Bluewater HSEQ policy, which sets out the principles to which all the affiliates and the Hæwene Brim FPSO and Aoka Mizu FPSO activities comply with. These include:

- ✓ Promoting Health, Safety and Environmental [HSE] Protection;
- ✓ Seeking and achieving continual improvement; and
- ✓ Compliance with all regulatory requirements.

The requirements of the policy are implemented through management systems, interface arrangements and operational management controls. The Bluewater policy is provided in Figure 3-1 overleaf.

Document title	HSEQ Policy	
Document number	BW1-Q-100-PH-0001-001	
Accountable person	President and CEO	
Date published	08/12/2017	

HSEQ Policy

Bluewater is committed to delivering quality and continuous improvement throughout all its activities, while satisfying all applicable requirements.

To this end company goals are formulated by top management, taking into account our compliance obligations and other requirements from interested parties.

At Bluewater a pro-active and responsible approach to safety and environmental care is an essential part of doing our work. We require the participation of all our staff and contractors to implement this approach.

We aim to:

- actively minimise and control any health and safety risks,
- prevent or minimise the adverse impacts of our activities on the environment and
- continuously improve our work processes as part of our Corporate Management System.

As such, we will drive the development and implementation of industry best practices.

With all our personnel collectively and individually taking responsibility and accepting accountability for Bluewater's HSEQ performance, we create and maintain a healthy, safe and environmentally friendly place to work.

Hugo J. Heerema
President & CEO
December 2017

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 All rights reserved. | https://corporate.bluewater.com/sites/cms/active/hseq_policy.docx
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Figure 3-1 Bluewater HSEQ Policy

Environmental Management

Bluewater is certified to ISO 14001:2015 standard (a copy of the certificate is presented below). Bluewater’s Environmental Management System [EMS] sets out guiding principles and mechanisms for managing HSE risk, impact and compliance in accordance with the Bluewater HSEQ Policy.



Figure 3-2 Copy of ISO14001:2015 Certificate

The Corporate Management System [CMS] describes how HSE performance is managed, taking into account all relevant elements, such as: legal requirements, stakeholders, risks / opportunities and company goals. The CMS is applicable to all employees and activities on all locations (onshore and installation and operational sites - offshore) and is based on the requirements of ISO 9001:2015 and ISO 14001:2015. Within the overall CMS, the Safety and Environmental Management System [SEMS] is the framework of policies, processes standards and procedures that ensures that the health, safety and environmental objectives can be achieved. The SEMS acts as the link between the policies and standards and local processes and procedures. The high level structure of the CMS is shown in Figure 3-3.

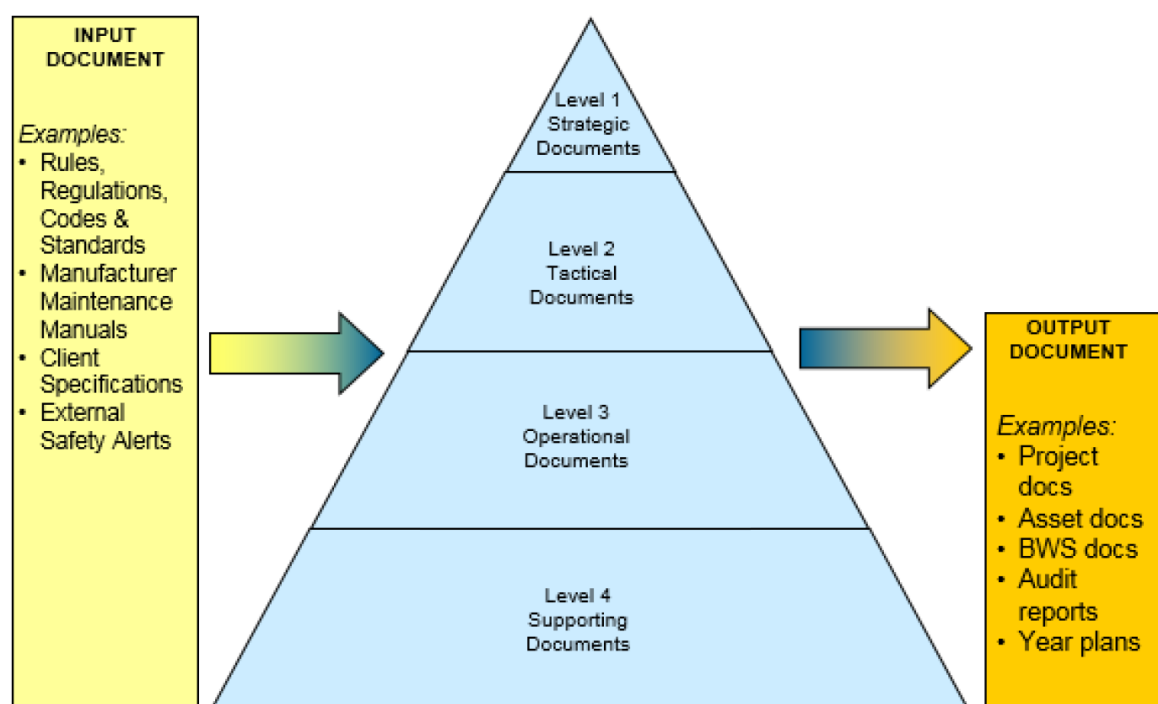


Figure 3-3 High Level Structure of the CMS

Key Environmental Management Activities in 2019

Bluewater's key environment related objectives and activities for 2019 were to ensure compliance with all environmental permits and relevant regulations and to progress a number of programmes to support continued improvement in performance, including:

- Successful maintenance of the ISO 14001 EMS certification;
- Offshore Environmental Compliance and Permit audits and inspections;
- Onshore Emergency Response exercises and Offshore Drills;
- Monitoring of asset performance and Environmental Key Performance Indicators [KPI] covering resource use and emissions to the environment; and
- Maintenance of the assets' Environmental Aspects Registers.

4. ENVIRONMENTAL PERFORMANCE

Hæwene Brim FPSO Environmental Performance

Atmospheric Emissions

Atmospheric emissions arise from power generation, flaring and fugitive emissions. The Hæwene Brim FPSO holds an Offshore Combustion Installation [PPC] Permit under the Offshore Combustion Installations (Pollution Prevention and Control) Regulations 2013 (as amended) for the combustion equipment onboard. Shell UK Ltd is the holder of the greenhouse gas emissions trading scheme (EUETS) permit, therefore certain emissions may be duplicated within their 2019 annual environmental statement. Table 4-1 provides the Production related fuel combustion and flaring emissions as reported into the Environmental Emissions Monitoring System [EEMS] through the UK Energy Portal. This covers the period from the 1st January 2019 to 31st December 2019.

Table 4-1 Hæwene Brim Atmospheric Emissions (1st January 2019 to 31st December 2019)

Atmospheric Emissions	Unit	Gas Consumption	Diesel	Flaring	Totals
Fuel Use	Tonnes	33,924.14	9,822.00	4,233.77	N/A
CO ₂	Tonnes	92,892.73	31,347.34	11,334.42	135,574.49
NO _x	Tonnes	209.16	497.65	5.07	711.88
SO ₂	Tonnes	0.43	19.64	0.05	20.12
CO	Tonnes	182.41	131.49	28.30	342.20
CH ₄	Tonnes	27.96	1.51	42.24	71.71
VOC	Tonnes	1.12	16.66	42.24	60.02

Water and Oil in Water Discharges

Liquid associated with the oil produced by the Pierce Field (oil and produced water) is processed through oil and water separation systems offshore with the cleaned produced water being discharged to sea. The Hæwene Brim FPSO holds a permit for produced water discharge under the Petroleum Operations (Oil Pollution Prevention and Control [OPPC]) Regulations. All produced water from the installation was discharged overboard. This amounted to 99,824.2 cubic metres for the period 1st January 2019 to 31st December 2019. The Hæwene Brim FPSO has two discharge routes for produced water and the installations drainage systems, as follows:

- The primary route is via the produced water treatment system. All produced water from the separators is routed to designated hydrocyclones via inline coalescers. The in-line coalescers help improve the performance of the downstream hydrocyclones by increasing the oil droplet size in the feed stream.
- The secondary route is from the FPSO slops tanks. Liquids are processed through a centrifuge system before being discharged to sea.

Table 4-2 provides the salient details for the produced water discharges as reported into the EEMS through the UK Energy Portal. This again covers the period from the 1st January 2019 to 31st December 2019.

Table 4-2 Hæwene Brim Produced Water Discharge Data (1st January 2019 to 31st December 2019)

Month	Sample Point (Source)	Produced Water Volume (m ³)	Monthly Average Oil in Water (mg/l)	Calculated Weight of Oil (tonnes)
January	Produced Water Treatment System	4,744.0	12.72	0.060
	Slops Centrifuge	4,354.0	54.88*	0.239
February	Produced Water Treatment System	5,571.8	12.30	0.069
	Slops Centrifuge	588.0	47.51*	0.028
March	Produced Water Treatment System	5,083.0	12.3215	0.063
	Slops Centrifuge	548.0	27.65	0.015
April	Produced Water Treatment System	3,106	9.79	0.030
	Slops Centrifuge	1,370.0	34.81*	0.048
May	Produced Water Treatment System	2,889.6	11.28	0.033
	Slops Centrifuge	857.0	24.73	0.021
June	Produced Water Treatment System	2,559.0	7.94	0.020
	Slops Centrifuge	3,372.0	21.53	0.073
July	Produced Water Treatment System	2,350.0	7.214	0.017
	Slops Centrifuge	3,047.0	20.75	0.063
August	Produced Water Treatment System	1,398.0	8.92	0.013
	Slops Centrifuge	2,738.0	24.37	0.068
September	Produced Water Treatment System	9,948.0	17.66	0.176
	Slops Centrifuge	2,344.0	22.49	0.053
October	Produced Water Treatment System	12,131.0	13.18	0.160
	Slops Centrifuge	4,329.0	20.07	0.087
November	Produced Water Treatment System	9,732.0	12.43	0.121
	Slops Centrifuge	4,240.0	16.57	0.07
December	Produced Water Treatment System	8,903.0	17.48	0.156
	Slops Centrifuge	3,622.0	20.36	0.074
Totals	Both Sources	99,824.4	-	1.754

*non-compliances

From Table 4-2 it can be seen that the total mass of oil discharged with the produced water during 2019 was 1.754 tonnes. Figure 4-1 and Figure 4-2 overleaf presents the oil in water average concentration from the primary and secondary route, respectively.

During January, February and April 2019 the discharge from the slops centrifuge system exceeded the 30 mg/l limit (Figure 4-2) required under the OPPC Permit. No breaches of the 30 mg/l limit were observed for the period for the Produced Water Treatment System (Figure 4-1). Permit non-compliance notifications were submitted to the regulators as required by the permit conditions.

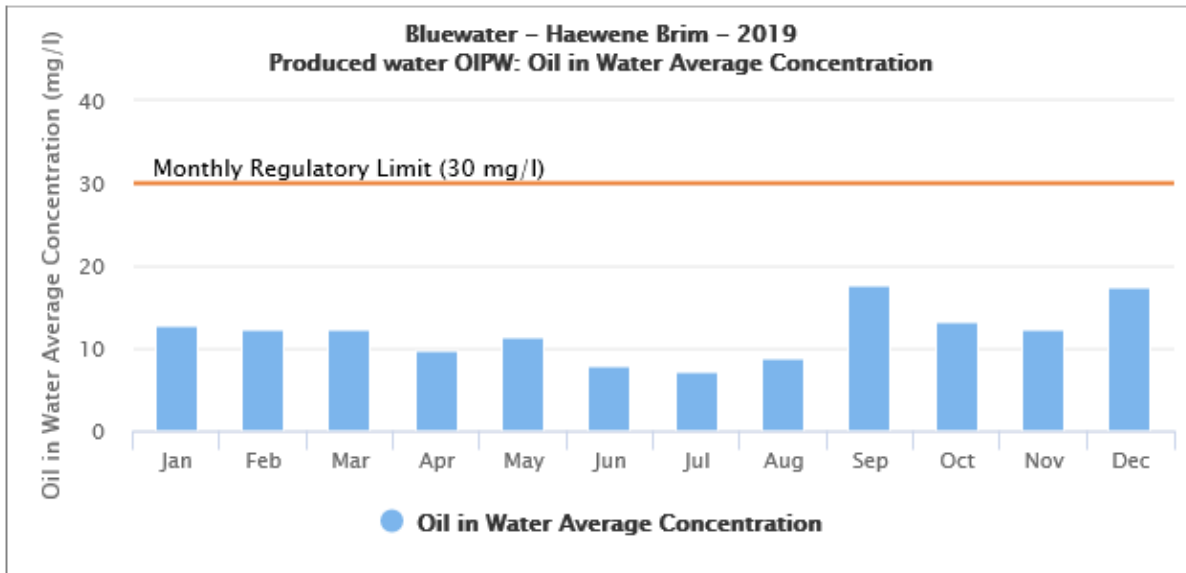


Figure 4-1 Produced Water Treatment System OIW monthly average concentration

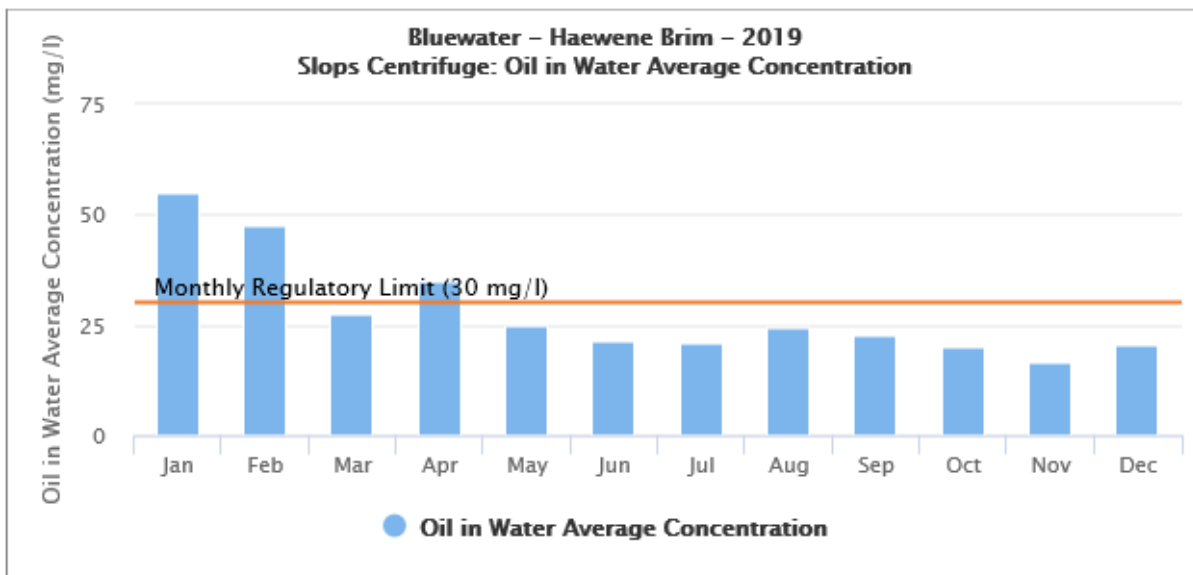


Figure 4-2 Slops Centrifuge OIW monthly average concentration

Chemical Use and Discharge

Under the Offshore Chemical Regulations [OCR] 2002 (as amended), the Hæwene Brim FPSO holds a permit for the use and discharge of chemicals. During 2019, a total of 303.3 tonnes of production chemicals were used and approximately 94% of the 303.3 tonnes of chemicals used were discharged to sea.

The Regulator has highlighted certain chemicals to be phased out by mean of substitution warning (SUB chemical warning). Only one SUB chemical (FX3060) was used during 2019 with a total use of 2.5 tonnes and 0 tonnes discharged. This chemical is not expected to be used in 2020 and has been removed from the asset’s chemical permit. A detailed breakdown of each chemical’s tracked usage and discharge against the permitted quantities is presented in Figure 4-3 and Figure 4-4 respectively.

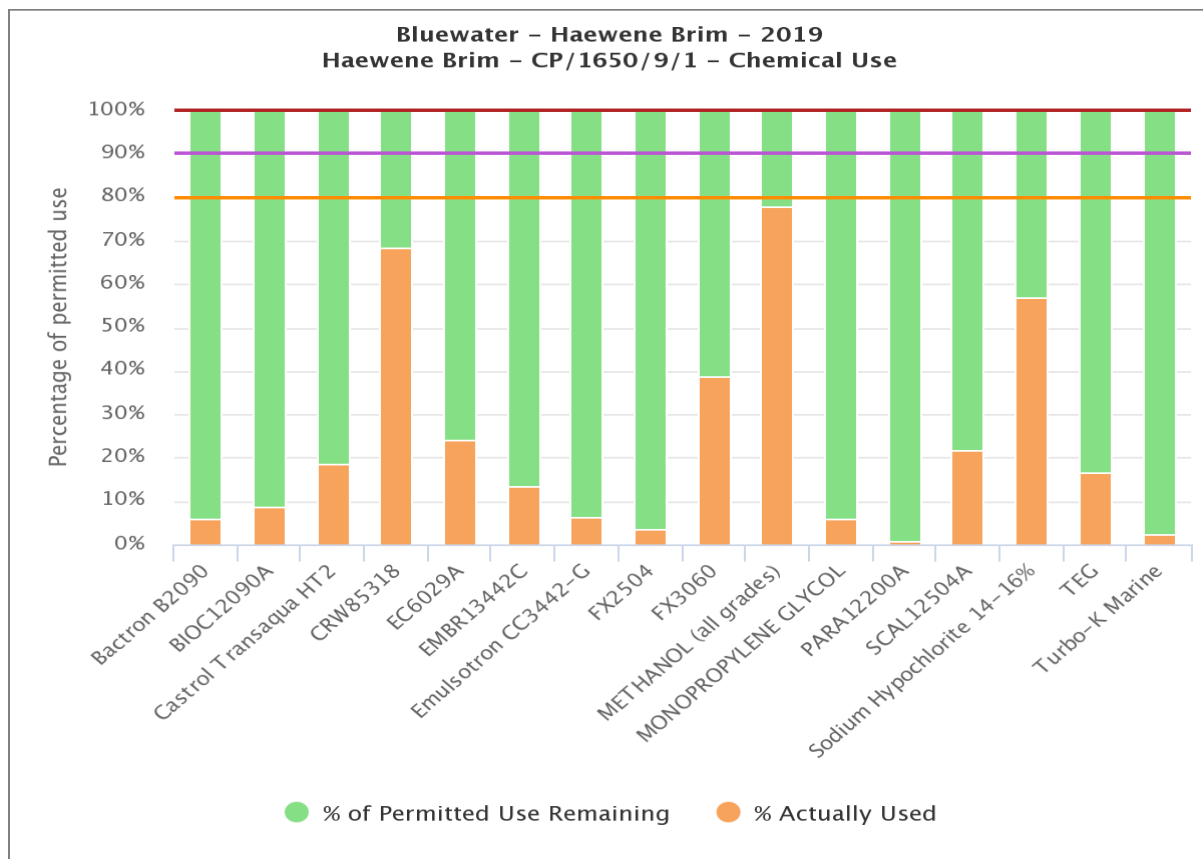


Figure 4-3 Hæwene Brim 2019 Chemical Use vs Permitted Quantities

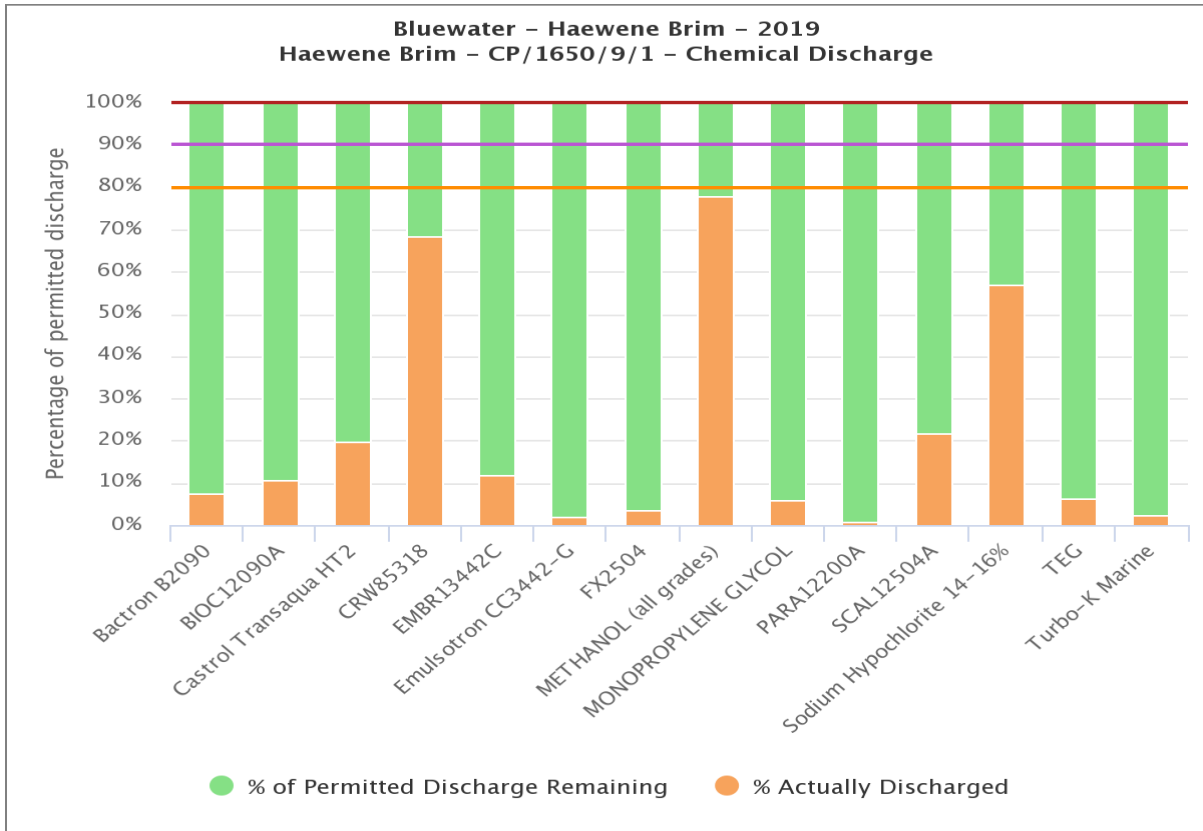


Figure 4-4 Hæwene Brim 2019 Chemical Discharge vs Permitted Quantities

The chemicals used comprised water based hydraulic fluids, corrosion inhibitors, gas hydrate inhibitors, scale inhibitors and cleaning fluids utilised during routine production operations. The majority of these chemicals were Hazard Quotient [HQ] Gold or Category ‘E’ or ‘D’ chemicals (the ratio of Predicted Effect Concentration against No Effect Concentration), thus have the least potential impact on the marine environment.

Chemicals are subject to continual review and Bluewater will continue to seek suitable alternatives, where appropriate to minimise impact on the marine environment.

Waste Management

Management and segregation of waste takes place on the installation prior to transfer to onshore facilities for recycling or disposal. Total waste arising during 2019 from the Hæwene Brim FPSO and the disposal routes is provided in Table 4-3.

Table 4-3 Hæwene Brim Waste Arising and Disposal Routes during 2019

Category	Reuse	Re-cycling	Waste to Energy	Incinerate	Landfill	Other	Total
	(t)	(t)	(t)	(t)	(t)	(t)	(t)
Group I – Special							
Chemicals/ Paints	-	-	8.798	14.465	-	24.174	47.437
Drums/ Containers	0.250	6.316	-	-	-	-	6.566
Oils	-	1.790	0.450	-	-	-	2.240
Miscellaneous Special Waste	-	0.945	8.900	-	5.990	262.670	278.505
Sludge's / Liquids / Washings	-	-	1.210	3.610	-	-	4.820
Sub-Total	0.250	9.051	19.358	18.075	5.990	286.844	339.568
Group II - General							
Chemicals/ Paints	-	-	-	4.255	-	0.210	4.465
Drums/ Containers	-	0.080	-	-	0.002	-	0.082
Scrap metal	-	24.621	-	-	-	-	24.621
Segregated Recyclables	-	79.080	-	-	15.015	-	94.095
General Waste	-	44.927	-	-	54.373	-	99.300
Sludge's / Liquids / Washings	-	-	-	-	-	-	-
Sub-Total	-	148.708	-	4.255	69.390	0.210	222.563
Group III - Other							
Asbestos	-	-	-	-	-	-	-
Radioactive Materials (exc NORM)	-	-	-	-	-	-	-
Clinical	-	-	-	0.103	-	-	-
Explosives	-	-	-	-	-	-	-
Sub-Total	-	-	-	0.103	-	-	-
Grand Total	0.250	157.759	19.358	22.433	75.380	287.054	562.234

From Figure 4-5 it can be seen that the Hæwene Brim FPSO recycled 28% of the total waste produced. Waste disposed to landfill amounted to 13% of the total waste produced. There are 287 tonnes of waste categorised as 'Other', this is mostly miscellaneous special waste (263 tonnes of waste bilge liquids, shipped to shore for treatment), equating to 51% of total waste. With the exception of 103 kg of clinical waste, no Group III [Other Wastes] wastes were produced in 2019.

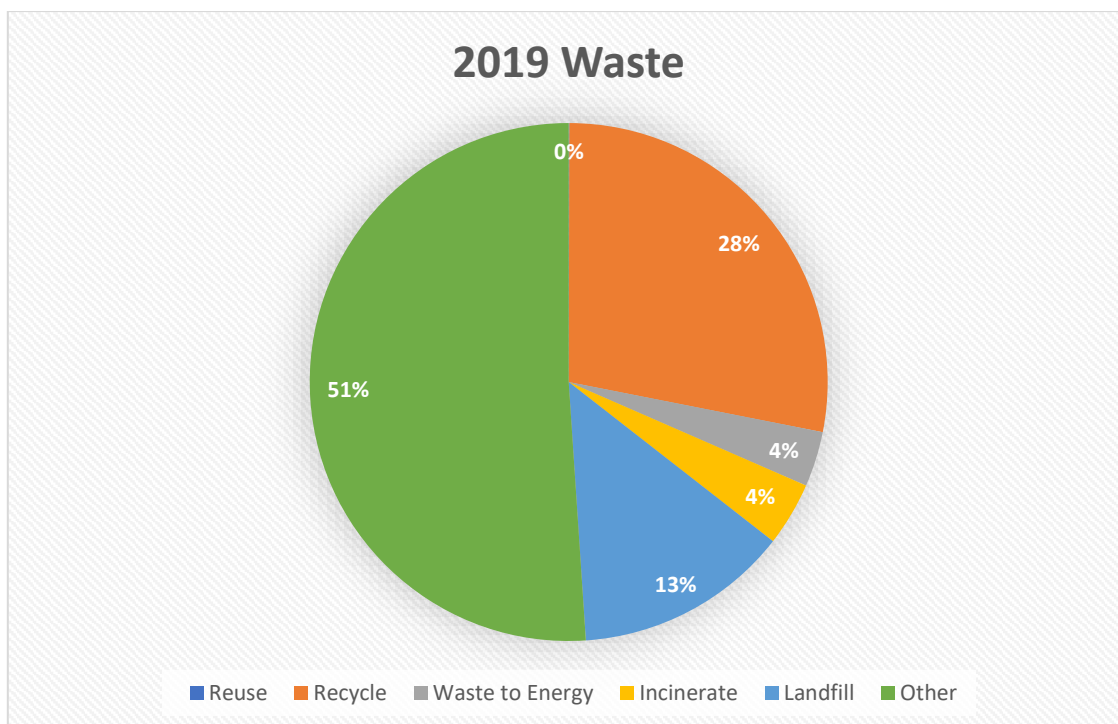


Figure 4-5 Hæwene Brim 2019 breakdown of generated waste

2020 Key Activities

The main offshore aims and objectives for the Hæwene Brim FPSO during 2020 are:

- ✓ Ongoing maintenance and implementation of the EMS, including
 - Maintenance of 14001:2015 Standard;
 - Environmental data monitoring & reporting schedules;
 - Environmental KPIs;
 - Environmental Aspects Registers and Controls;
 - HSE Management System Interface documentation.

- ✓ Audit and review of Permits and Consents management and compliance associated with Environmental Management Systems and Processes;
- ✓ Continued management of asset integrity and process safety to minimise the risk of spills;
- ✓ Duty of Care audit of waste management processes and waste management contractor.

Aoka Mizu FPSO Environmental Performance

Atmospheric Emissions

Atmospheric emissions arise from power generation, flaring and fugitive emissions. The Aoka Mizu FPSO holds a PPC Permit under the Offshore Combustion Installations [PPC] Regulations 2013 (as amended) for the combustion equipment onboard. Hurricane holds the EU ETS GHG permit although Hurricane does not prepare an ES under OSPAR 2003/5. Table 4-4 provides the Production related fuel combustion and flaring emissions as reported into EEMS through the OGA UK Energy Portal. This covers the period from the 1st January 2019 to 31st December 2019.

Table 4-4 Aoka Mizu Atmospheric Emissions (1st January 2019 to 31st December 2019)

Atmospheric Emission	Unit	Gas Consumption	Diesel	Flaring	Totals
Fuel Use	Tonnes	1,350.00	7,917.49	35504.18	N/A
CO ₂	Tonnes	3,651.91	25,256.80	99,921.87	128,830.58
NO _x	Tonnes	12.90	375.16	42.61	430.67
SO ₂	Tonnes	0.02	15.83	0.45	16.3
CO	Tonnes	8.10	98.69	237.88	344.67
CH ₄	Tonnes	1.24	1.13	355.04	357.41
VOC	Tonnes	0.05	12.49	355.04	367.58

Water and Oil in Water Discharges

Liquid associated with the oil produced by the Lancaster Field (oil and produced water) is processed through oil and water separation systems offshore with the cleaned produced water being discharged to sea. The Aoka Mizu FPSO holds a permit for produced water discharge under the OPPC Regulations.

All produced water from the installation was discharged overboard. This amounted to 24,157.6 cubic metres for 2019. The Aoka Mizu FPSO has three discharge routes for produced water and the installations drainage systems, as follows:

- An ad hoc CETCO separation unit;
- The FPSO's slops tanks; and
- The FPSO's hydrocyclone units.

Table 4-5 provides the salient details for the produced water discharges as reported into the EEMS through the UK Energy Portal (only months with reported discharges are shown). This covers the period from the 1st January 2019 to 31st December 2019. Out of the entire year, discharges only took place during the second half of 2019.

Table 4-5 Aoka Mizu Produced Water Discharge Data (1st January 2019 to 31st December 2019)

Month (2019)	Sample Point (Source)	Produced Water Volume (m ³)	Monthly Average Oil in Water (mg/l)	Calculated Weight of Oil (tonnes)
July	CETCO Overboard	-	-	-
	Hydrocyclones	-	-	-
	Slops Tanks	3,616.0	25.48	0.092
August	CETCO Overboard	-	-	-
	Hydrocyclones	-	-	-
	Slops Tanks	1,117.0	37.90*	0.042
September	CETCO Overboard	-	-	-
	Hydrocyclones	3,429.0	19.55	0.067
	Slops Tanks	-	-	-
October	CETCO Overboard	163.6	32.64*	0.005
	Hydrocyclones	7,789.0	23.37	0.182
	Slops Tanks	-	-	-
November	CETCO Overboard	-	-	-
	Hydrocyclones	8,043.0	20.48	0.165
	Slops Tanks	-	-	-
December	CETCO Overboard	-	-	-
	Hydrocyclones	-	-	-
	Slops Tanks	-	-	-
Totals	All Sources	24,157.6	-	0.553

*non-compliances

The total mass of oil discharged with the produced water during 2019 was 0.553 tonnes. During August and October 2019 the discharge from the slops tanks and the CETCO overboard unit respectively exceeded the 30 mg/l limit (Figure 4-6) required under the Offshore Petroleum Activities (OPPC) Regulations 2005 (as amended). Permit non-compliance notifications were submitted to the regulators as required by the permit conditions.

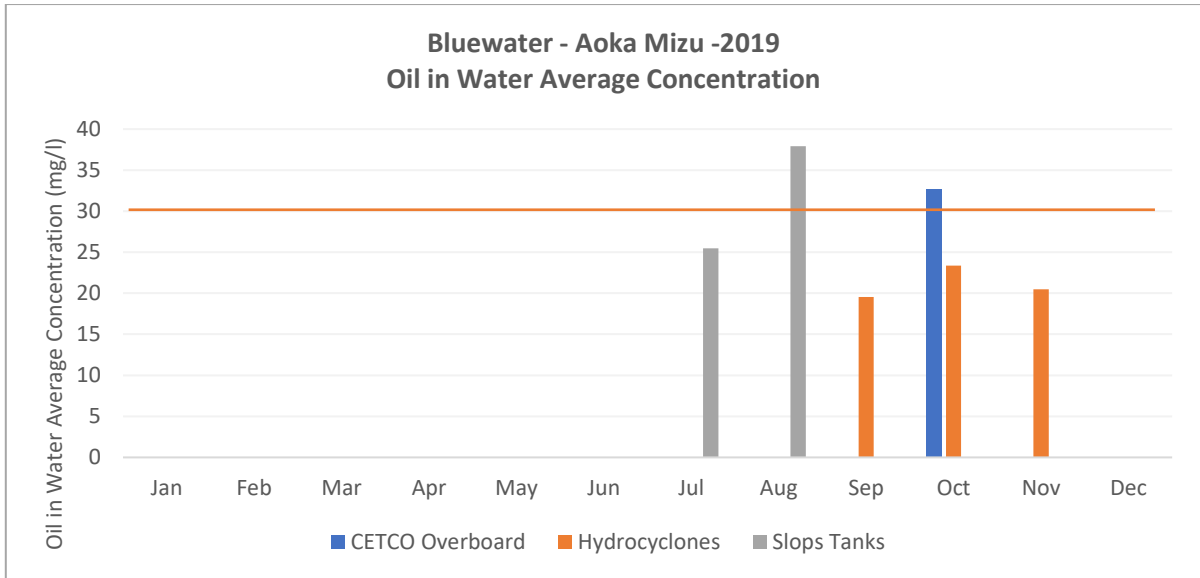


Figure 4-6 OIW monthly average concentration for all discharge locations

Chemical Use and Discharge

Under the OCR 2002 (as amended), the Aoka Mizu FPSO holds a permit for the use and discharge of chemicals. During 2019 a total of 331.2 tonnes of production chemical were used. The Regulator has highlighted certain chemicals to be phased out by mean of substitution warning (SUB chemical warning). Two SUB chemicals (PHASETREAT 14371 and RX-7025) were used during 2019 with a total use of 257.8 tonnes. PHASETREAT 14371 is not expected to be used in 2020 and has been removed from the asset’s chemical permit. In total approximately 5% of the 331.2 tonnes of chemicals used were discharged to sea. A detailed breakdown of each chemical’s tracked usage and discharge against the permitted quantities is presented in Figure 4-7 and Figure 4-8.

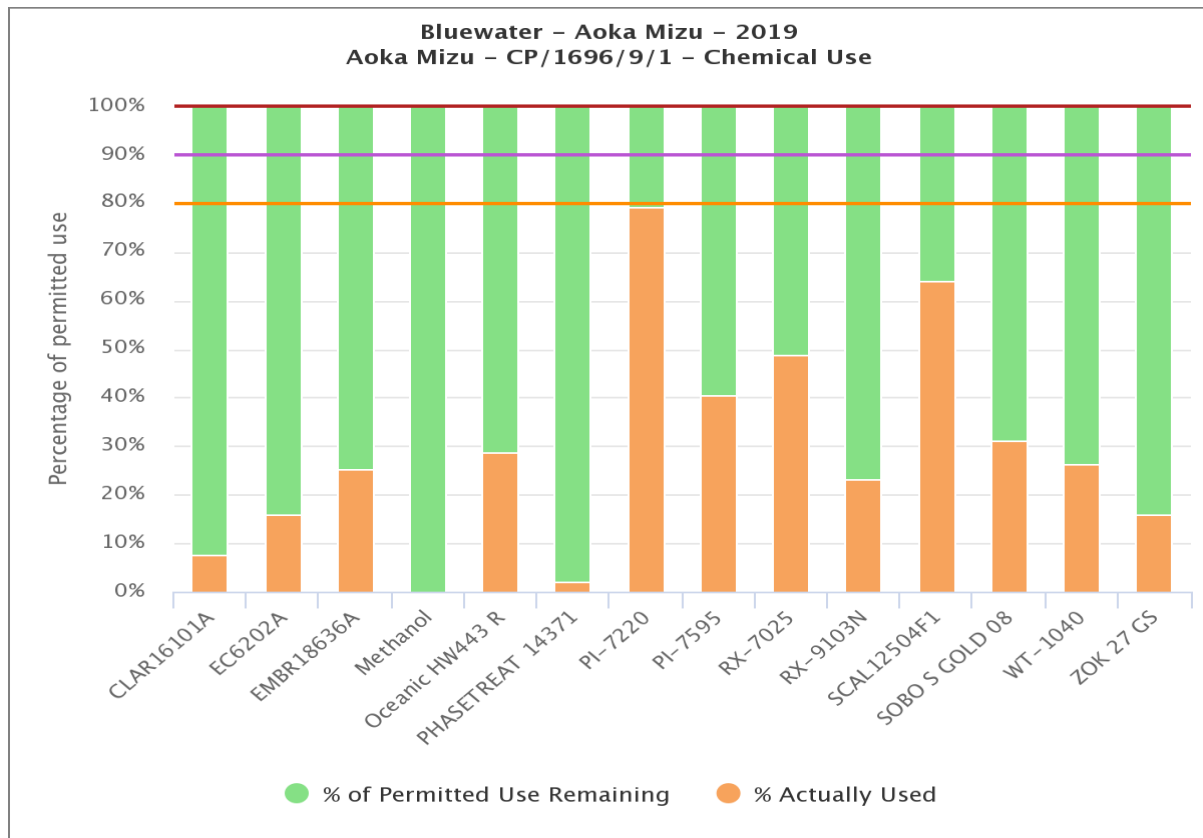


Figure 4-7 Aoka Mizu 2019 Chemical Use vs Permitted Quantities

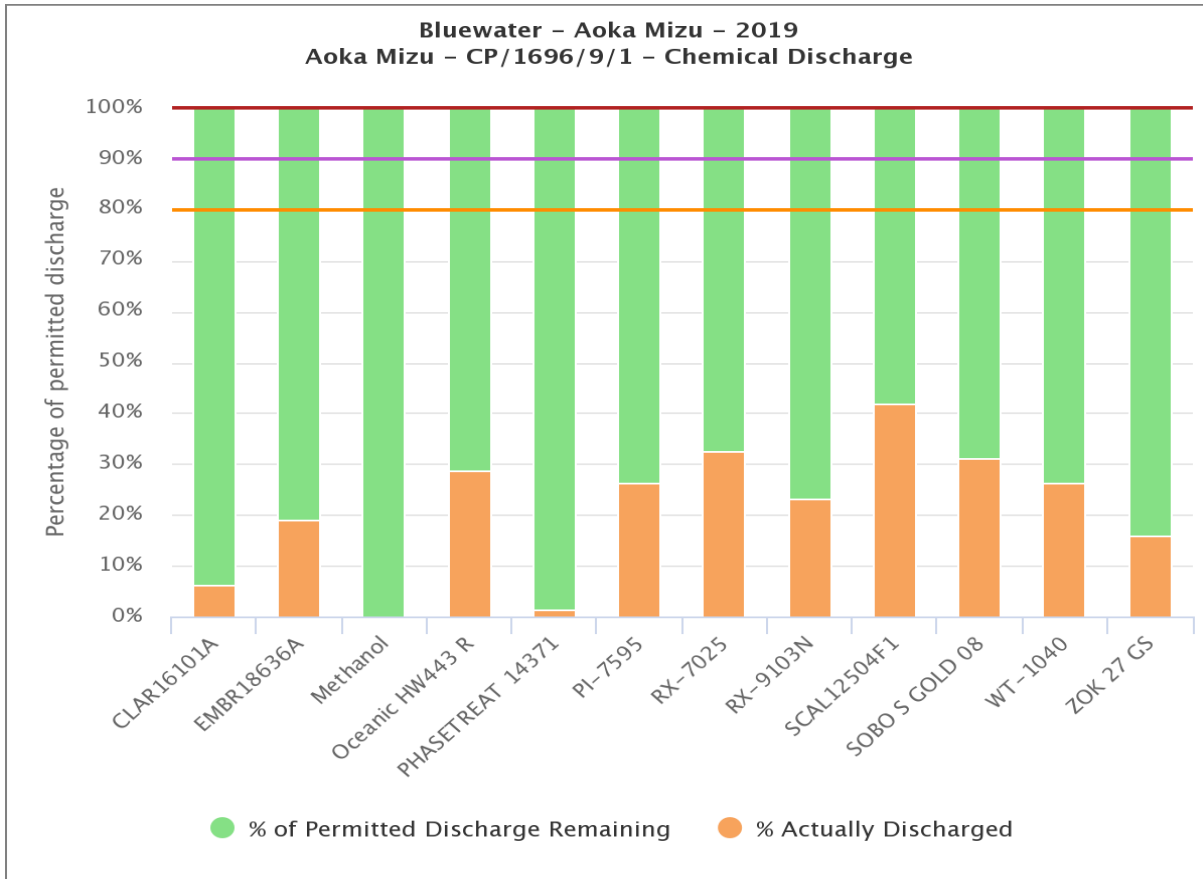


Figure 4-8 Aoka Mizu 2019 Chemical Discharge vs Permitted Quantities

The chemicals used comprised water based hydraulic fluid, corrosion inhibitors, gas hydrate inhibitor, scale inhibitor, water clarifiers/demulsifiers, biocide, wax inhibitor/dissolver, asphaltene inhibitor and cleaning fluids utilised during routine production operations. The majority of these chemicals were Hazard Quotient [HQ] Gold or Category ‘E’ or ‘D’ chemicals (the ratio of Predicted Effect Concentration against No Effect Concentration), thus have the least potential impact on the marine environment.

Chemicals are subject to continual review and Bluewater will continue to seek suitable alternatives where appropriate to minimise impact on the marine environment.

Waste Management

Management and segregation of wastes takes place on the installation prior to transfer to onshore facilities for recycling or disposal. Total waste arising from the Aoka Mizu FPSO and the disposal routes are provided in Table 4-6.

Table 4-6 Aoka Mizu Waste Arising and Disposal Routes during 2019

Category	Reuse	Re-cycling	Waste to Energy	Incinerate	Landfill	Other	Total
	(t)	(t)	(t)	(t)	(t)	(t)	(t)
Group I – Special							
Chemicals/ Paints	-	0.032	9.615	-	-	23.625	33.272
Drums/ Containers	-	3.754	-	-	-	-	3.754
Oils	-	-	-	-	-	-	-
Miscellaneous Special Waste	-	3.343	4.420	-	0.090	0.550	8.403
Sludge's / Liquids / Washings	-	73.650	-	-	-	179.275	252.925
Sub-Total	-	80.779	14.035	-	0.090	203.450	298.354
Group II - General							
Chemicals/ Paints	-	-	-	-	-	-	-
Drums/ Containers	-	-	-	-	-	-	-
Scrap metal	-	1.350	3.310	-	-	-	4.660
Segregated Recyclables	-	19.120	15.620	-	0.430	-	35.170
General Waste	-	24.112	-	-	39.468	-	63.580
Sludge's / Liquids / Washings	-	-	-	-	-	-	-
Sub-Total	-	44.582	18.930	-	39.898	-	103.410
Group III – Other							
Asbestos	-	-	-	-	-	-	-
Radioactive Materials (exc NORM)	-	-	-	-	-	-	-
Clinical	-	-	-	-	-	-	-
Explosives	-	-	-	-	-	-	-
Sub-Total	-	-	-	-	-	-	-
Grand Total	-	125.361	32.965	-	39.988	203.450	401.764

From Figure 4-9 it can be seen that the Offshore Installation recycled 31 % of the total waste produced. Waste disposed to landfill amounted to 10 % of the total waste produced. There was also approximately 203 tonnes of “Other” waste, mostly comprising of waste bilge liquids, equating to 51% of total waste (Table 4-6).

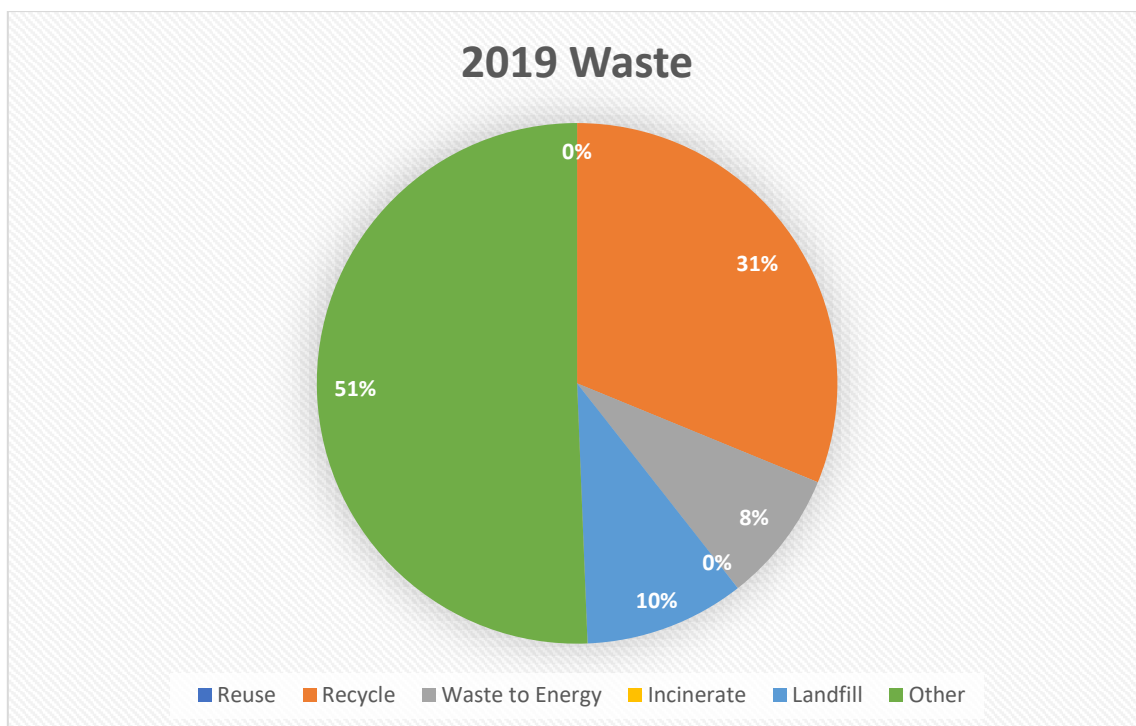


Figure 4-9 Aoka Mizu 2019 breakdown of generated waste

2020 Key Activities

The main offshore aims and objectives for the Aoka Mizu FPSO during 2020 are:

- ✓ Ongoing maintenance and implementation of the EMS, including
 - Maintenance of 14001:2015 Standard;
 - Environmental data monitoring & reporting schedules;
 - Environmental KPIs;
 - Environmental Aspects Registers and Controls; and
 - HSE Management System Interface documentation.
- ✓ Audit and review of Permits and Consents management and compliance associated with Environmental Management Systems and Processes;
- ✓ Continued management of asset integrity and process safety to minimise the risk of spills; and
- ✓ Duty of Care audit of waste management processes and contractor.

5. INCIDENTS

Under UK legislation any unplanned / unpermitted releases of oil and chemicals discharged to the marine environment are required to be reported to OPRED via the Petroleum Operations Notice No.1 [PON 1] reporting system. No reportable spills occurred during 2019 from the Hæwene Brim FPSO or the Aoka Mizu FPSO.

Other reportable incidents / operations notices that occurred during 2019 for the assets are detailed in Table 5-1 (16 in total). Most non-conformances are associated with breaching monthly or daily Oil in Water limits. Measures have been implemented on both assets to improve oil in produced water concentrations.

Table 5-1 2019 reportable incidents

Date	Asset	Non-Conformance Type	Description
10/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.00787 tonnes.
11/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.00406 tonnes.
14/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.00644 tonnes.
15/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.04018 tonnes.
20/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.00956 tonnes.
21/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.0061 tonnes.
31/01/2019	Hæwene Brim	OPPC Non-Conformance	Discharge exceeded 100 mg/l oil in water concentration from the slops tank discharge point. Total oil discharge during non-compliance was 0.00075 tonnes.
January 2019	Hæwene Brim	OPPC Non-Conformance	Monthly average concentration of dispersed oil produced water discharged above permitted concentration of 30 mg/l
February 2019	Hæwene Brim	OPPC Non-Conformance	Monthly average concentration of dispersed oil produced water discharged above permitted concentration of 30 mg/l

Date	Asset	Non-Conformance Type	Description
April 2019	Hæwene Brim	OPPC Non-Conformance	Monthly average concentration of dispersed oil produced water discharged above permitted concentration of 30 mg/l
07/10/2019	Hæwene Brim	PON 10	Failure of the forward primary navigation light and the portside aft primary light. The navigation lights system on the Haewene Brim was obsolete and has since been replaced with a new system, rectifying these issues.
August 2019	Aoka Mizu	OPPC Non-Conformance	Monthly average concentration of dispersed oil produced water discharged above permitted concentration of 30 mg/l. In August the monthly average was 37.9 mg/l (1,117 m ³ of water total discharge) from the slops discharge point.
October 2019	Aoka Mizu	OPPC Non-Conformance	Monthly average concentration of dispersed oil produced water discharged above permitted concentration of 30 mg/l. A non-compliance of 32.64 mg/l (163.6 m ³ of water total discharge) oil concentration average for October was recorded from the CETCO unit discharge point.
10/07/2019	Aoka Mizu	OCR Non-Compliance	A non-compliance notification was submitted for the use and discharge of Scale Inhibitor SCAL12504F1 exceeding permitted levels by greater than 110 %. 2017 kg was use and discharged against a permitted quantity of 850 kg.
09/10/2019	Aoka Mizu	OCR Non-Compliance	The use and discharge of Scale Inhibitor SCAL12504F1 had exceeded permitted levels a by greater than 110 %, with 3,698 kg used and discharged.
End of year	Aoka Mizu	PPC Non-Compliance	FPSO had exceeded permitted emissions of SO _x and VOCs for 2019. 15.9 tonnes of SO _x were emitted against a permitted amount of 7 tonnes, 12.6 tonnes of VOCs were emitted against a permitted amount of 15.9 tonnes.

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Abbreviations

BEIS	Department for Business, Energy and Industrial Strategy
CH₄	Methane
CMS	Corporate Management System
CNS	Central North Sea
CO	Carbon Monoxide
CO₂	Carbon Dioxide
EEMS	Environmental Emissions Monitoring System
EMS	Environmental Management System
FPSO	Floating Production Storage and Offloading
HQ	Hazard Quotient
HSE	Health Safety & Environmental
HSEQ	Health, Safety, Environmental and Quality
KPI	Key Performance Indicators
mg/l	Milligrams per Litre
NO_x	Nitrous Oxides
OCR	Offshore Chemical Regulations
OIW	Oil in Water
OPPC	Oil Pollution Prevention and Control
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PPC	Production Prevention and Control
PPCL	Pierce Production Company Limited
SEMS	Safety and Environmental Management System
SO_x	Sulphur Oxides
SUB	Chemicals Rated for Substitution
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
VOCs	Volatile Organic Compounds