2024 Annual Environmental Performance – Rough Offshore Facilities

Contents

Glossary of Abbreviations

Abbreviation	Meaning
ALARP	As low as reasonably practicable
bcf	Billion Cubic Feet
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CES+	Centrica Energy Storage +
CH_4	Methane
COB	Close of Business
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DESNZ	Department for Energy Security and Net Zero
EA	Environment Agency
EF	Emissions Factor
ELV	Emissions Limit Value
ETS	Emissions Trading Scheme
GC-FID	Gas Chromatography Flame Ionisation Detector
GHG	Greenhouse Gas
HGS	Humber Gathering System
HSE	Health, Safety, Environmental
IR	Infrared radiation
ISO	International organisation for standardisation
LPFG	Low Pressure Flash Gas
LPG	Liquid Petroleum Gas
MCZ	Marine Conservation Zone
Mscm	Million Standard Cubic Metres
NCV	Net Calorific Value
NORM	Naturally Occurring Radioactive Material
NOx	Oxides of Nitrogen
NPAI	Non-Permanently Attended Installation

NPD	Naphthalenes, Phenanthrenes, Dibenzothiophenes
NTS	National Transmission System
OF	Oxidation Factor
OIM	Offshore Installation Manager
OiW	Oil in Water
OMS	Operations Management System
OPPC	Oil Pollution Prevention and Control
OSPAR	Oslo and Paris Conventions
P&A	Plug and Abandonment
PAH	Polycyclic Aromatic Hydrocarbons
PON	Petroleum Operations Notice
PPC	Pollution Prevention and Control
SAC	Special Area of Conservation
SNS	Southern North Sea
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
VOC	Volatile Organic Compounds

1 Overview

From 2017 to 2022, over four and a half years, the Rough field had operated as a production only asset following the removal of the Rough Undertakings in 2017. Initially this was on a free flow model where gas was extracted using the natural well pressures. However from 2018 there was a requirement to use onshore gas compression to extract gas. The expected COB (Close of Business) was expected to be around late 2023 or early 2024.

As of September 2022, due to global market conditions in the supply of gas, the Rough field was converted back to a gas storage asset having successfully applied for a storage consent and associated permits. The consent allows the Rough facility to operate for up to ten years (to 2032) albeit at a lower pressure and storage volume than previously. Throughout the second half of 2022 the maximum storage of the field was around 20% compared with previous capacity at 59 bcf of gas.

Recommencement of storage started in September 2022 and continued until the field reached its maximum permitted capacity in late November 2022. From this point, the field reverted to production for the winter season, which is when demand is higher. The storage model continued throughout 2022-2024.

Currently all storage and production capabilities are processed via the 47/3 Bravo platform as it was also decided to permanently withdraw the Rough 47/8 Alpha platform from service and start the preparations to decommission the platform. In 2018, Well Plug and Abandonment (P&A) work was initiated leaving the Rough 47/8 Alpha wells in a mechanically plugged state. During 2019, a jack-up vessel was acquired to support a Non-Permanently Attended Installation (NPAI) enabling works to enable the de-manning of 47/8 Alpha platform.

Full abandonment of the wells by means of capping and filling was due to commence in 2020, however the global COVID-19 pandemic delayed this for a few years. It was expected to recommence in 2022 and permits/licences associated with this work were granted for work to start in September 2022. However, a few delays with the jack up rig (Valaris Norway) at its previous job and poor weather conditions meant the work was delayed until 2023. The full P&A works were completed in 2023 with the last jack up leaving the platform in July 2023.

For all the above-mentioned activities, environmental aspects and impacts were assessed prior to commencement of the work and monitored throughout, considering the whole life cycle impacts on resources to prevent pollution, reduce waste and ensure their efficient use.

Throughout 2024, as per the Centrica Health, Safety, Environmental and Security Policy (Appendix 1), CES+ have continued to place a huge importance on their environmental responsibilities and continue to be committed to understanding, managing and reducing the environmental and ecological impacts of our activities through innovation, technology and cultural change. As part of this, CES+ successfully maintained the ISO 14001:2015 standard in 2024 and continue to maintain and develop improvements in line with this.

2 Executive Summary

Centrica Storage Limited owns and operates the Rough Gas Facilities which is located approximately 29 kilometres off the east coast of Yorkshire. The platforms are permitted to undertake regulated activities under a Production/Storage licence, Consent to Vent, OPPC Permit, Chemical Permit, PPC Permit and Consent to Locate. Under these permits and consents, CES+ are required to monitor, record and report emissions released to air and water. The amount and classification of waste is also required to be reported. A greenhouse gas emissions permit was also live however, following the removal of the RGT gas turbines offshore in 2021, this permit was formally surrendered in 2022.

Throughout 2024, the Rough Offshore Facilities operated for 299 (260 by hours) days in both injection and production modes. During this time, 899.54 Mscm of gas was produced and a total of 707.32 Mscm was injected back into the reservoir for storage. There was a planned maintenance outage on the 47/3B platform in March, May and September 2024, which was largely to allow for plant modifications and maintenance.

2.1 Releases to Air

An application to surrender Greenhouse gas emissions permit on the 47/3B (UK-D-13143) was made in 2022. Following review by the UK ETS, official confirmation that the GHG emissions permit had been surrendered was received on 2nd September 2022 confirming no returns would be required in 2022. Therefore, no returns were required in 2023. CES+ have continued to monitor CO_2 emissions on the platform and will continue to do so. Throughout 2024 the asset produced 6,619 tCO_2e, which is a slight increase when compared to 2023 (6,521 tCO_2e). This is likely due to the additional maintenance period which would require venting the asset for safety.

2.2 Releases to Water

The 47/3 Bravo produced water on 86 days, with a total of 404 m^3 of Produced Water discharged to sea and 9.36 kg of associated oil.

The produced water was analysed for radioactivity during Q1 and Q2 2024. During Q3 and Q4, there was an insufficient volume of produced water to complete a sample.

All chemicals used were within permitted limits. Throughout 2024, the Rough Gas Facilities discharged a total of 275 kg of chemicals into the sea. All other chemicals used were returned to shore through the sealine and were either recovered or disposed of.

2.3 Waste

The Rough Gas Facilities generated a total of 403.11 tonnes of waste throughout 2024, of which all but 0.06 tonnes were recovered (recycled or sent for treatment). From the total amount of waste generated, 249.29 tonnes were categorised as non-hazardous and 153.82 tonnes as hazardous waste.

2.4 Non-Conformities

CES+ exceeded the monthly average Oil in Water once during 2024 but did not exceed the daily maximum concentration. CES+ submitted 8 PON1s throughout 2024, all of which were under a tonne, with the maximum release being 0.000084 tonnes, which was caused by part of an oil drum blowing out of a bund leading to a small quantity of oil being spilled onto the deck. Except for the non-conformities mentioned above, all releases to the environment have been within the permitted limits set out by the various permits and consents under which the Rough gas facilities operate.

3 Introduction

3.1 Site Location & Operation

The Rough offshore gas field is located approximately 29 kilometres off the east coast of Yorkshire. The Rough offshore facilities comprise of the Rough 47/8 Alpha (two bridge-linked platforms), which is undergoing decommissioning, and Rough 47/3 Bravo (three bridge-linked platforms) complexes. The complexes are approximately 2 kilometres apart and were designed to produce gas from the reservoirs 30 wells. There are now 12 operational wells available on 47/3B only for the production of natural gas and condensate.

During production, the nature of the reservoir results in some contamination with water and indigenous hydrocarbons, necessitating separation offshore. Water and condensed hydrocarbons are removed by the offshore process prior to transmission via the 36-inch sealine to shore. The small quantities of produced water are discharged to sea and the natural gas condensate is re-injected into the pipeline and carried ashore with the gas.

During injection the same 12 wells are used to inject gas back into the reservoir. When the asset was previously a storage asset, gas was injected using offshore compression to boost the maximum pressures to around 90 barg, however, following the reinstatement of gas storage onshore NTS gas pressures are used. In 2024, the maximum operational capacity of the Rough field was 58 bcf of gas.

Corrosion inhibitor is injected on the 47/3 Bravo platform to prevent corrosion of the sealine. Methanol is also injected into the sealine to prevent the build-up of hydrates. Production fluids are transferred, via the subsea pipeline, to the onshore Easington Terminal.

3.2 47/8 Alpha

With the 47/8 Alpha no longer operational, CES+ made the decision to isolate the platform from the reservoir through mechanical plugging and to kill the wells with inhibited seawater. In addition to this, CES+ also made the decision to de-man the installation in 2019. The activities associated with the wells took place from October 2018 through to March 2019, with the Non-Permanently Attended Installation enabling works taking place in May 2019.

Full abandonment of the wells by means of capping and filling was due to commence in 2020, however the global COVID-19 pandemic delayed this for a few years. It was expected to recommence in 2022 and permits/licences associated with this work were granted for work to start in September 2022. However, several delays with the jack up rig (Valaris Norway) at its previous location and poor weather conditions meant the work was delayed until 2023.

In 2023, Valaris arrived alongside 8A on the 24th January. Full plug and abandonment works were commenced. This work was subsequently completed with the last jack up vessel leaving on the 1st July. The outstanding work to complete decommissioning of 47/8 Alpha is the removal of the platform itself which is expected to be completed around 2027, and the subsea infrastructure around 2032.

3.3 Environmental Permits

The Rough Gas Facilities operate under the following permits.

3.3.1 Production, Unloading and Storage Licence

On 23rd April 2020, CES+ applied for and obtained a long-term production consent (PCON/5439/(Version 1)) which permits CES+ to extract gas from the Rough Gas Field until 31st December 2023. Prior to this, CES+ operated and extracted gas under Production Licence PCON4517/0 (Version 2).

Since September 2022, CES+ has operated as a storage, reobtaining a production, unloading and storage licence. On 21st November 2023, CES+ applied for and obtained a production, unloading and storage licence (PR/2285/2(Version 2)) valid until 31st August 2024. This licence superseded the Production Consent which was therefore was left to expire. In May 2024 CES+ requested and obtained an extension of the Gas Storage consent from 31/08/2024 to 30/04/2025, maintaining the same maximum / minimum storage volume and pressure consent limits.

3.3.2 Consent to Vent

The Consent to Vent (VCON/6702/0(Version 2)) permits CES+ to dispose of unignited natural gas into the atmosphere under the Rough Gas Field Petroleum Production Licence. In 2024 this licence allowed the 47/3B platform to vent gas at a rate of no more than 0.612 tonnes on average daily, lower than 2023 showing our commitment to reducing our emissions.

The purpose of venting under this consent is to

- facilitate the planned start-up, shut-down or maintenance of plant and equipment, or to ensure its efficient operation, or
- to protect plant, equipment or persons.

As venting is a loss of primary product, CES+ endeavour to limit the amount of gas lost through venting.

3.3.3 OPPC Permits

The Rough Offshore Facilities operate under Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 permits. These permits allow the discharge of oil in accordance with the arrangements described within the permit for the Rough BD platform (OLP/72/11 (Version 1)). The Rough AD platform formally operated under oil discharge permit (OLP/74/6 (Version 1)) however, this was surrendered due to production no longer taking place on the asset.

3.3.4 Chemical Permits

During 2024, the Rough Offshore Facilities operated under two Offshore Chemicals Regulations 2002 permits, one for 47/8 Alpha (CP/300/17-19) which was withdrawn at the end of 2024, and the other for 47/3 Bravo (CP/197/22). These permits require that all chemicals used or discharged during the operations are listed on the permit. Where chemicals are discharged to sea, the discharge is undertaken in accordance with the conditions detailed within the permit and appropriate measures are taken to minimise discharge.

3.3.5 Greenhouse Gas Permit

An application to surrender Greenhouse gas emissions permit on 47/3B (UK-D-13143) was made in March 2022. Following a review by the UK ETS, official confirmation that the GHG emissions permit had been surrendered was received on 2nd September 2022 confirming no returns would be required in 2022, therefore by extension, also none required in 2024. CES+ have continued to monitor CO_2 emissions on the platform and will continue to do so.

3.3.6 PPC Permit

Following the removal of the RGT gas turbines offshore in 2021, CES+ formally applied to surrender the PPC permit for the BD platform as the current equipment no longer falls under the medium combustion plant requirements. The surrender of this permit (reference: PPC/70) was granted and came into effect on 6th October 2023.

3.3.7 Consent to Locate

The Consent to Locate designates the geographic location of the platforms (47/8 Alpha – CP/151/7(Version 2) and 47/3 Bravo – CL/150/7 (Version2)) and the outlines the navigation aids required to ensure safe navigation of vessels at sea.

3.4 Environmental Management System

CES+ have a certified ISO 14001:2015 Environmental Management System which demonstrates our commitment and responsibility to understand, manage and reduce the environmental impact of our operations in a manner which protects the environment and its resources. The environmental management system is integrated within health and safety, as well as the business management activities. Central to the environmental management system is strong leadership, continuous improvements, and good performance baselines. Annual environmental improvement plans are developed to measure and report improvements. The environmental management system is audited both internally and externally.

4 Emissions Monitoring

A condition of all the permits described in Section 3.3 is the monitoring and recording of emissions from the activities undertaken by the Rough Offshore Facilities. Throughout 2024, CES+ have undertaken the required monitoring of all emission sources and ensured that all reporting requirements have being fulfilled. The following sections discuss the monitoring of each of these activities.

4.1 Releases to Air

Releases to air are emissions of Carbon Dioxide (CO_2), Carbon Monoxide (CO), Oxides of Nitrogen NOx), and Methane (CH_4). The quantities of the above gases are calculated from the total volume of fuel gas used, diesel usage, gas vented, and an estimated release of fugitive emissions. The monitoring of emissions includes those from routine, non-routine and abnormal operations, and includes start-up, shutdown and emergency situations.

4.1.1 Fuel Gas Consumption

4.1.1.1 47/8 Alpha

There is no qualifying combustion equipment on the 47/8 Alpha platform therefore the platform is exempt from the UK Emissions Trading Scheme and does not hold a PPC Permit.

4.1.1.2 47/3 Bravo

Following on from the removal of the RGT gas turbines in 2021 and the subsequent surrendering of the greenhouse gas emissions permit, the 47/3B asset does not consume any fuel gas. The PPC permit was also surrendered in 2023 due to there being no qualifying combustion plant on the asset. All power/heating needs are met by the three Aggreko diesel power units and heating medium with back up diesel generators, which are available if required.

4.1.2 Diesel Consumption

Since 2022, diesel has been the primary source of power generation and heating in the form of; the three Aggreko diesel generators, heating medium heater, firewater pumps and crane activities. Consumption of diesel can be assumed to be equal to the amount of diesel bunkered on the platforms, therefore, equal to the quantities recorded on the bunker delivery notes. The density factor (0.8382 t/m^3) used to convert litres to tonnes is obtained from the most recent Digest of UK Energy Statistics (DUKES), Annex A, Average conversion factors for petroleum, which can be found at: https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

The *NCV* factor (42.5688 GJ/t) and emissions factor (74.9375 tCO2/TJ) for diesel are taken from the UK GHG Latest UK inventory factors. These factors are sourced from the GOV.UK website at: https://www.gov.uk/guidance/participating-in-the-eu-ets#complying-with-the-eu-ets

The total CO_2 emission is calculated using the ISO6976 methodology and is a product of diesel combusted, a net calorific value (*NCV*), an emissions factor (*EF*) per unit of fuel used, and a standard oxidation factor (*OF*).

$$CO2\ (t) = Diesel\ Combusted\ \times NCV \times EF\ \times OF$$

4.1.3 Venting

Venting of natural gas represents a loss of primary energy and is the largest source of unburnt hydrocarbon emissions from the platforms. Venting of natural gas is required as a result of planned maintenance or blowdown situations. The amount of gas vented is recorded on the EnergySys system.

4.1.4 Fugitive Emissions

Fugitive emissions are emissions of gas from pressurised equipment due to leaks, weeps and seeps, and other unintended or irregular releases from operating activities. These emissions cannot be measured, therefore, it is considered that 48 tonnes of fugitive emissions are released every six months from the platforms.

4.2 Releases to Water

The releases to the surrounding sea are subject to the OPPC and Chemical permits. The discharge of these substances is controlled and emitted through dedicated emission points that are specified on the above-mentioned permits.

4.2.1 Produced Water

4.2.1.1 47/8 Alpha

The 47/8 Alpha platform does not generate produced water, therefore there are no requirements to monitor and sample produced water.

4.2.1.2 47/3 Bravo

Produced water is water which is generated from the reservoir and is extracted along with the extraction of the gas. The water can be contaminated with hydrocarbons and Naturally Occurring Radioactive Material (NORM). The OPPC permit requires the sampling and reporting of oil content at least monthly, an analysis for NORM quarterly, and the in-depth bi-annual analysis of the water.

The equipment used on 47/3 Bravo to process Produced Water before sampling and discharging to sea are described below.

- An Inlet Separator – this is a vertical 2-phase separator which acts as a sand trap to minimise sand erosion and blockage of the downstream equipment.
- An Injection Separator – this provides hold-up and separation for bulk liquids.
- Test Separator – allows liquid separation. Condensate will separate from the water phase and is then routed off.
- Off-Spec Condensate Vessel - a horizontal three phase separator with baffles and inclined plate pack to assist oil-water separation.
- Oily Water Separator - is an inclined plate separator that separates hydrocarbons from the produced water.

- Oil Absorption Media Filter Package - removes any residual hydrocarbon from the water phase prior to discharge. The water samples for the required permitted analysis are taken from a sample point after the Oil Absorption Media Filter Package prior to discharge. Additional polishing filters were installed towards the end of 2022, which can be run in either series or parallel, meaning when wells are brought online it is possible to send the liquid through both sets of filters. However, during periods of low OiW readings they can be run in series which enables filters to be changed out whilst some remain online.

4.2.1.3 Oil in Water

Analysis of Oil in Water should use the OSPAR reference methodology for oil in produced water. However, this methodology requires the use of gas chromatography using a flame ionisation detector and n-pentane as an extraction solvent, which is unavailable on the platform. CES+ use a simpler DESNZ approved analytical methodology which is correlated against the OSPAR Reference Method.

4.2.1.4 Radioactivity

There is a requirement under the Radioactive Substances Act 1993 to determine whether produced water is radioactive as defined in Schedule 1 of Radioactive Substances Act 1993. For each Quarter, while generating Produced Water, a sample is taken and sent to Public Health England to undertake the analysis and detection of Polonium-210 (Pb-210), Actinium 228 (Ac-228) and Radium 226 (Ra-226). The analysis follows the fully documented procedures contained in CRCE Glasgow Radiochemistry Group Technical Manual.

4.2.1.5 Bi-annual Water Analysis

The bi-annual water analysis includes testing for the presence of Polycyclic Aromatic Hydrocarbons (PAH), BTEX chemicals (benzene, toluene, ethylbenzene and xylene heavy metals), heavy metals, phenols, alkyl phenols, organic acids, oil in water, NPDs (Naphthalenes, Phenanthrenes, Dibenzothiophenes) and inorganic compounds.

The purpose for undertaking the bi-annual water analysis is to build-up a regulatory database of information on the amounts of various constituents of produced water discharged to sea.

4.2.2 Chemical Permits

Under the Chemical Permits, all chemicals used are to be monitored and their usage recorded. The chemicals used are essential to the operation and are used sparingly and responsibly to ensure limited impact on the environment.

Under the 47/3 Bravo Chemical Permits, apart from ZOK MX GS and Offshore Degreaser EF, which are discharged to sea, all other chemicals permitted and used on the Rough Offshore Facilities are returned through the 36-inch sealine pipe to Easington Gas Terminal, to be treated ashore.

Only deck cleaning chemicals have remained on the 47/8 Alpha Chemical Permit although none were used throughout 2024.

4.3 Waste

CES+ have a duty of care and take measures to ensure that all controlled waste generated on the Rough Offshore Facilities are treated, segregated, stored, and disposed in an appropriate manner to prevent the likelihood of pollution or harm to health. The Offshore 47/3 Bravo Garbage Management Plan (PR/3B/07/03/ENV/00449) provides a detailed description of how waste is managed on the platform. The offshore 47/8 Alpha Garbage Management Plan (DOC-CES+-HSE-ENV-006a) has been archived as it is no longer applicable. Any waste for 47/8 Alpha will be handled in accordance with the COMOPS documentation of any specific jack up rig.

The waste generated on the platform is separated into various waste streams but can be categorised into general/industrial waste and hazardous waste. The waste is transferred to the support vessel before being sent to shore to a treatment or disposal facility. The transfer of waste is accompanied with appropriate transfer documentation.

5 Emissions Reporting

A condition of the permits is the reporting of emissions from the regulated activities undertaken at the Rough Offshore Facilities. CES+ have fulfilled its responsibility to report the 2023 emissions and below is a discussion of the Rough Offshore Facilities performance against the permit conditions. Trends, using historical data, have also being discussed.

5.1 Performance

Throughout 2024, the Rough Offshore Facilities operated for 299 days. During this time 899.54 Mscm of gas was produced and a total of 707.32 Mscm was injected back into the reservoir for storage. There was a planned maintenance outage on the 47/3B platform in March, May and September, which was largely to allow for maintenance activities.

5.1.1 Environmental Observations

CES+ run a HSE Observation system which allows all employees and contractors to report activities which they may consider to be unsafe or may cause an incident which is harmful to personnel, the environment or plant. The observations are reviewed in a daily meeting by the OIMs, supervisors, and HSE advisors. These meetings allow opportunity for discussions on safety and environmental themes and include any significant learning from monitoring activities, accidents and near misses.

During 2024, there were 7,431 observations raised on the platforms, of which 107 were directly related to environmental concerns and 1093 were environmental observations which include noise, weather and housekeeping. CES+ consider that the number of observations raised in 2024 has had a direct contribution to the prevention of potential incidents.

5.2 Releases to Air

5.2.1 CO_2 Emissions

Through the combustion of diesel, Rough Gas Facilities released 6,619.40 tCO_2e during 2024.

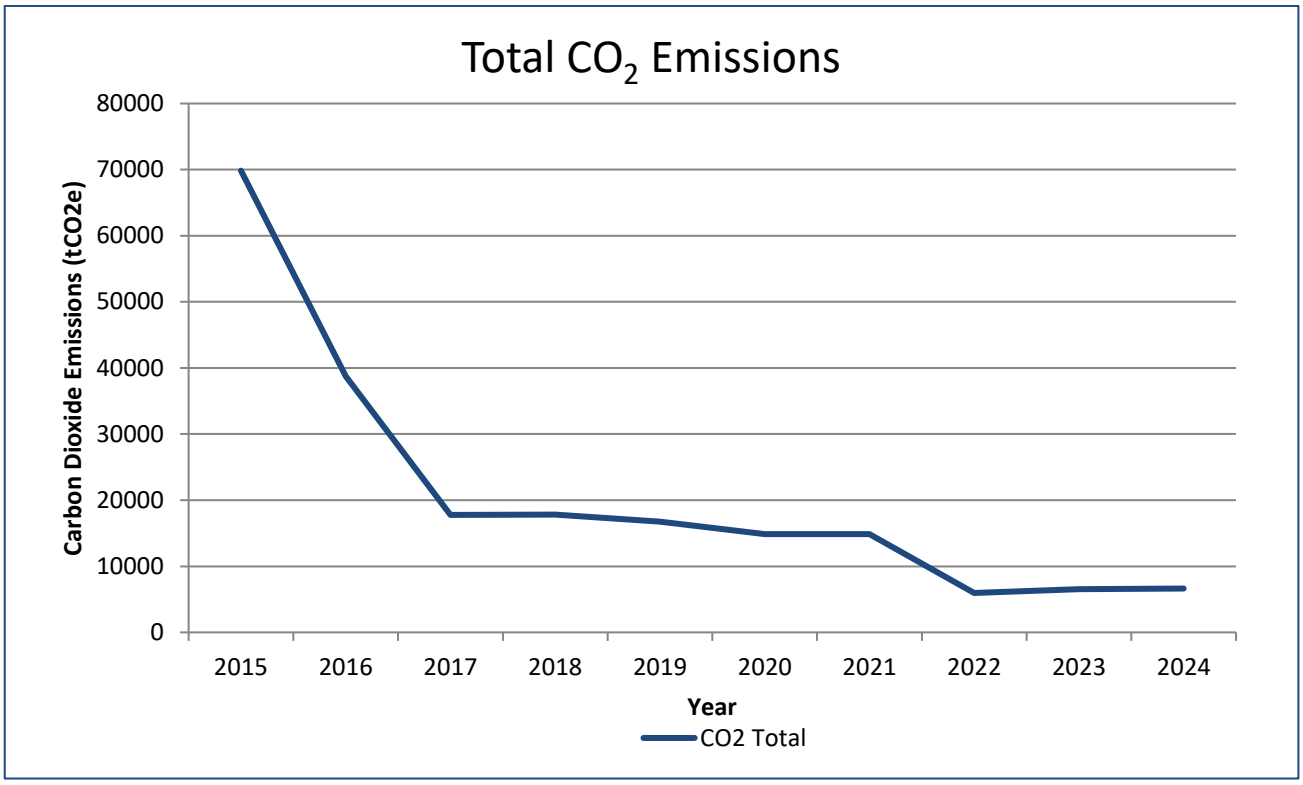

Figure 1: Annual CO2 emissions from Rough Offshore Facilities.

There has been a reduction in CO_2 emissions since 2015, with the CO_2 emissions plateauing after the cessation of storage operations (injection of gas). Due to large amounts of fuel gas combusted for injection operations, the trend in CO_2 emissions and gas injected was directly proportional. With the amount of gas injected reducing from 2014 until the cessation of storage operations in mid-2016, CO_2 emissions also reduced. Since injection operations had ceased, CO_2 emissions remained relatively constant from 2017. The decrease from 2021 to 2022 is due to the installation of diesel power generators, which reduced emissions due to the project replacing the RGTs which were no longer efficient when solely producing. In 2022, CES+ assumed a seasonal production and injection model once again due to market conditions but this did not increase emissions as the offshore compressor was not reinstated. The emissions have remained relatively steady since 2022.

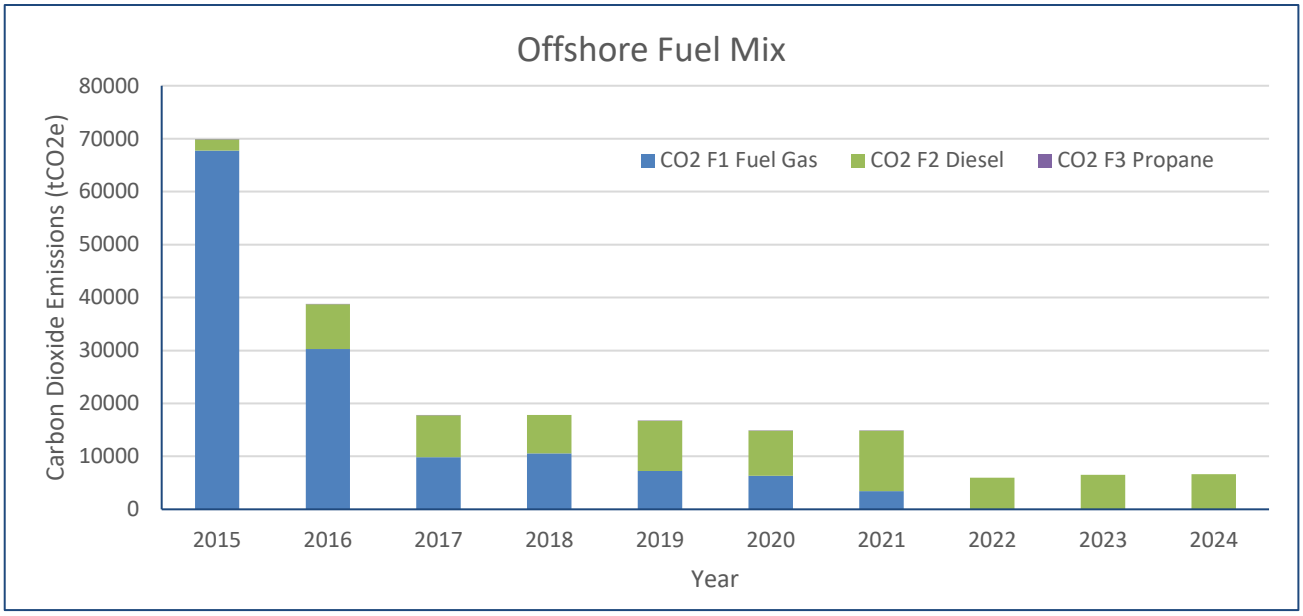

Figure 2: CO2 emissions from different fuel types.

5.2.2 Non-Greenhouse Gas Emissions

Through the operations on the Rough Gas Facilities the following releases were calculated.

5.2.2.1 Nitrogen Oxides (NOx)

There was a total of 27.02 tonnes of Nitrogen Oxides (NOx) released during 2024. The amount of NOx being released from the Rough Gas Facilities has declined since 2015. This is in line with the reduced use and removal of the RR Avon 1535-161 Gas Turbines, used for gas injection operations, and therefore the reduction in fuel gas consumption. The amount of NOx released remained steady since 2022 as no action that would cause a further reduction took place in these years.

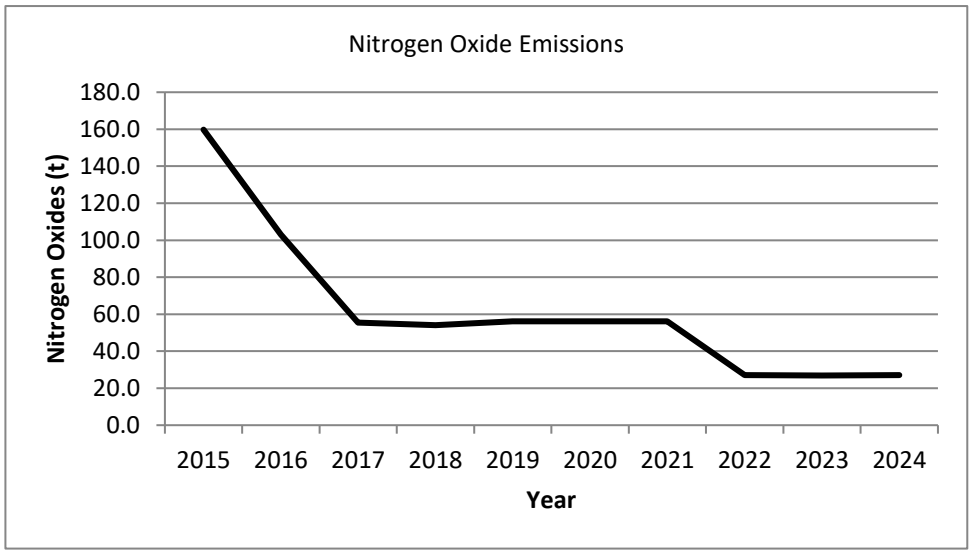

Figure 3:Nitrogen Oxides (NOx) released to the atmosphere between 2015-2024.

5.2.2.2 Sulphur Dioxide (SO_2)

There was a total of 8.0 tonnes of Sulphur Dioxides (SO_2) released during 2024. The increase in SO_2 emissions in 2016 onwards is due to the increase in diesel usage previously discussed. However, due to reduced diesel usage, SO2 emissions are lower in 2022 to 2024.

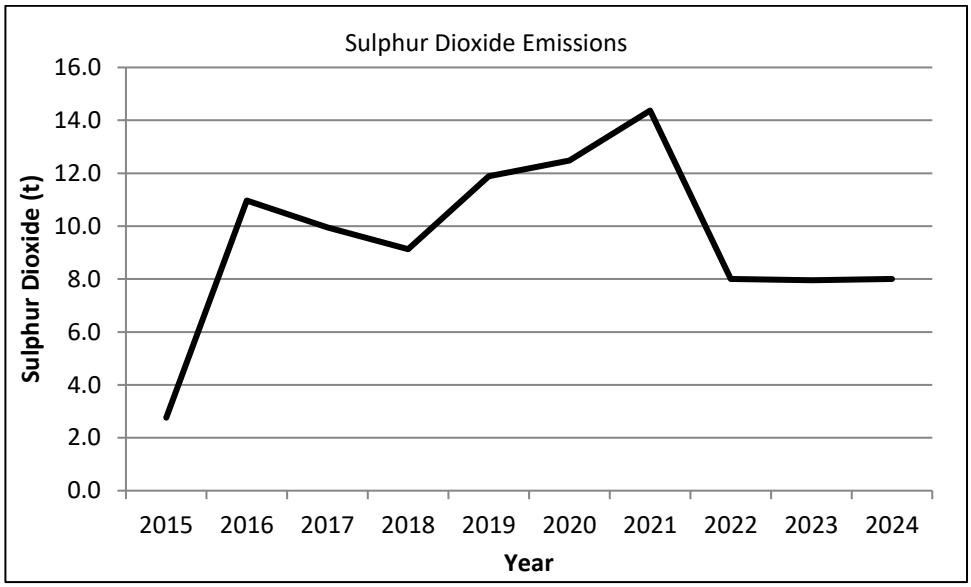

Figure 4:Sulphur Dioxide (SO2) released to the atmosphere between 2015-2024.

5.2.2.3 Carbon Monoxide (CO)

There was a total of 1.8 tonnes of Carbon Monoxide (CO) released during 2024. The CO emissions continue to follow a downward trend following a spike in CO emissions in 2015. This is in line with the reduction in fuel gas and is heavily linked to diesel usage hence very similar figures since 2022.

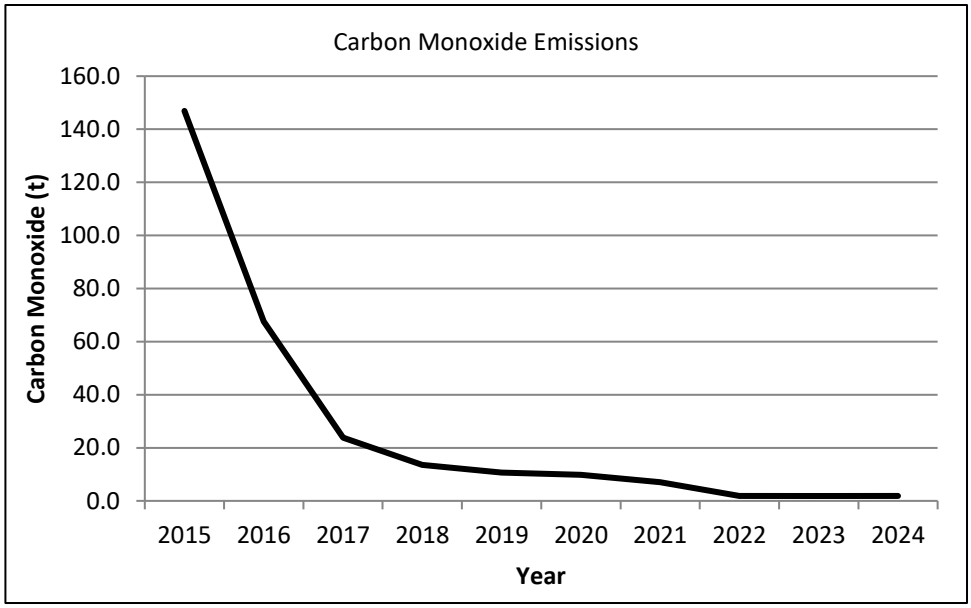

Figure 5: Carbon Monoxide (CO) released to the atmosphere between 2015-2024.

5.2.2.4 Volatile Organic Compounds (VOCs)

There was a total of 5.9 tonnes of Volatile Organic Compounds (VOCs) released during 2024. The amount of VOCs released is in line with the amount of gas vented. Due to the venting of gas being a loss of primary product, CES+ endeavour to reduce venting to as low as reasonably practicable (ALARP).

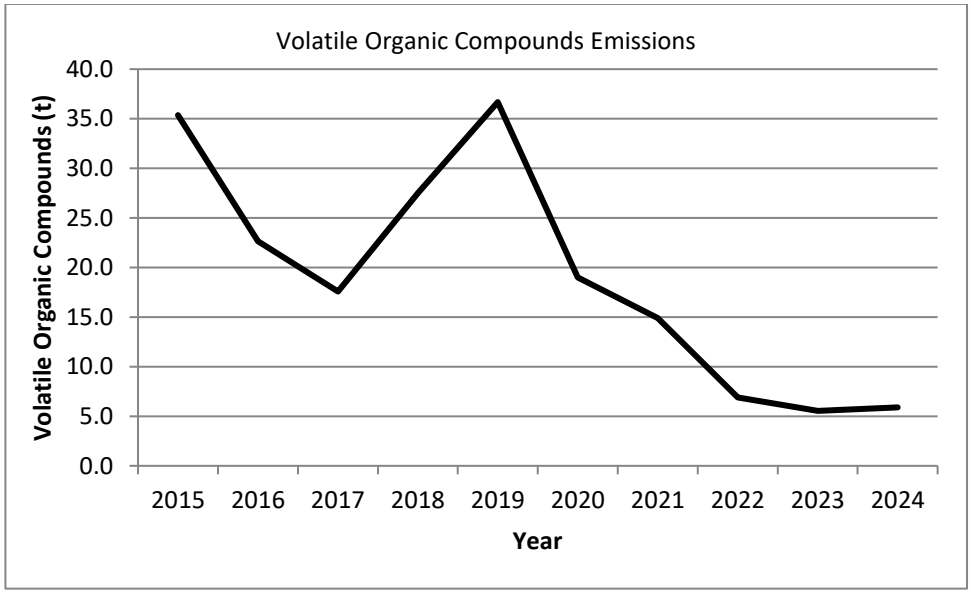

Figure 6: Volatile Organic Compounds (VOCs) released to the atmosphere between 2015-2023.

5.2.3 Methane Releases

Methane released is calculated by the amount of gas vented and the estimated amount of fugitive gas. During 2024, it was calculated that 149.2 tonnes of methane was released into the atmosphere.

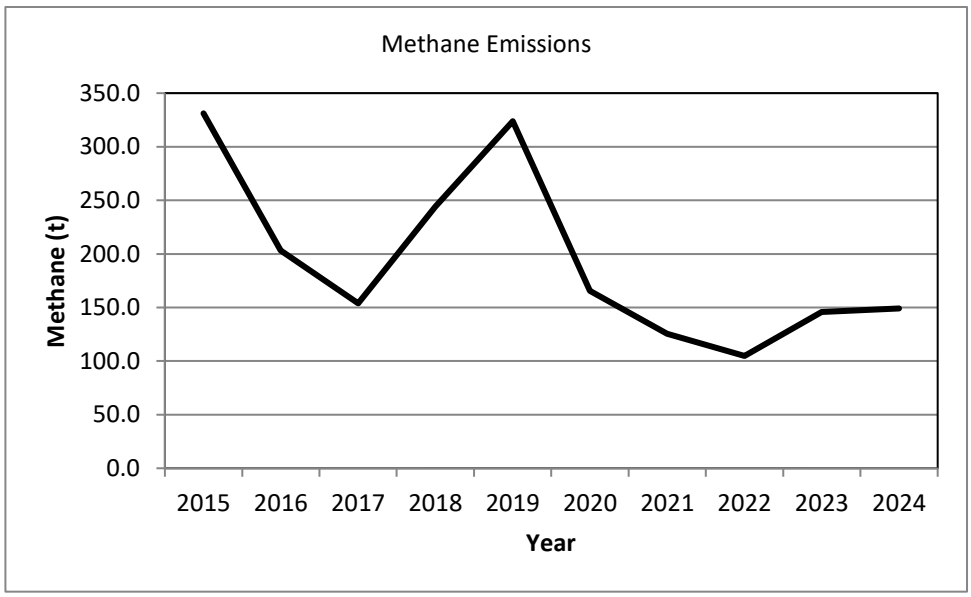

Figure 7: Methane released to the atmosphere between 2015-2024.

5.3 Releases to Water

5.3.1 Oil in Water Content

At the end of 2017, CES+ applied for and obtained approval for a transition from storage to production operation licence. A review of the reservoir by a registered third-party subsurface specialist, identified that with the production of native gas, produced water would continue to be generated at a rate, which is constant to the gas production rate, and it is considered very unlikely that there will be any significant influx of formation water. As production rates decrease throughout the life of the reservoir, so will the rates of produced water generated.

In 2024, the oil in water levels increased from January to March, as expected following the trend from 2023, due to the reservoir producing increased quantities of liquids as production season progresses. When produced water was generated, samples were taken and analysed on the platform by trained Operations Technicians. In March, the oil concentration was 46.43 mg/L, exceeding the permitted maximum monthly average of 30 mg/L. This was reported to DESNZ by completing an OPPC notification. Following this, research was conducted into different solutions to reduce the oil concentration and prevent future violation of the permitted limit. A change in filter arrangement has since been implemented.

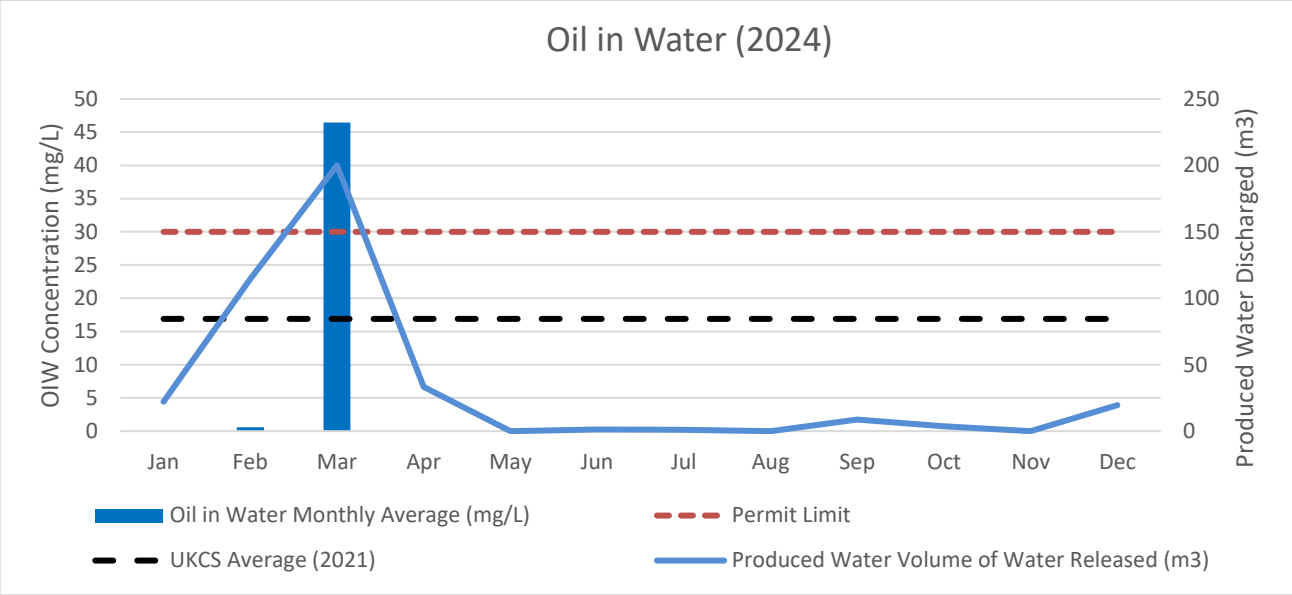

Figure 8: Monthly breakdown of produced water discharge and associated oil release.

CES+ breached the maximum concentration limit for a single reading (100 mg/L) three times on the 16-18th March. The readings were declared to DESNZ via an OPPC notification (IRS/2024/4305/OPPC). This breach was a result of the field reaching the end of its life and thus producing more oil. Changing of the filters were unable to reduce the concentration. Following discussions with OPRED, further actions and assessments were completed and a solution has now been implemented.

During the injection season, no oil in water is produced therefore from April-August all readings were zero. By September 2024, the asset was in production season again.

5.3.2 Radioactivity

Samples of produced water were taken and tested for radioactivity in Q1 and Q2 2024, with all results except for one test of Ac-228 being below the limit of detection (LOD). This returned to below the LOD in the following test. No further tests were conducted in the year due to insufficient volume of produced water for sampling.

5.3.3 Bi-Annual Analysis of Produced Water

Typically, CES+ send two samples of produced water, one in H1 and one in H2, to an accredited laboratory for detailed analysis. The sample in H1 of the year was taken on the 19/02/2024. A sample in H2 was unable to be taken due to insufficient volumes of produced water produced in H2 production season.

5.3.4 Chemical Permits

5.3.4.1 47/8 Alpha

With the suspension of gas extraction on the 47/8 Alpha platform, only deck maintenance chemicals were permitted for use throughout 2024.

Table 1: Chemicals Used under Chemical Permit CP/300/19 in 2024.

Chemical	Permit Limit (Kg)	Amount Used (Kg)
Offshore Degreaser EF.	300	0
Rigger XL-N	1080	0
Cleanup DG-N	600	0

5.3.4.2 47/3 Bravo

Figure 9 shows the usage of corrosion and hydrate inhibitors on the 47/3 Bravo platform. All chemicals were within the permit limit and were sent back to shore in the 36-inch sealine pipe. These chemicals are used to prevent the build-up of hydrates and corrosion in the pipeline.

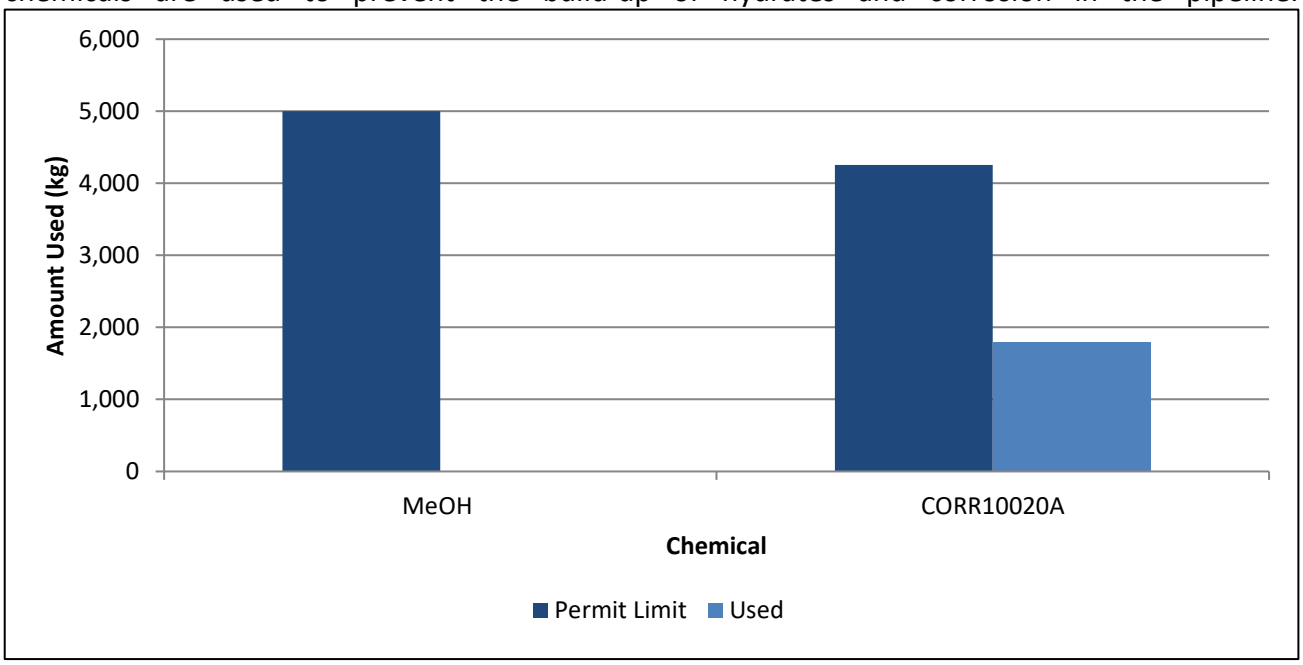

Figure 9: Corrosion and Hydrate usage on 47/3 Bravo in 2023.

Figure 10 shows the usage of wells chemicals and deck cleaning fluids. All chemicals were within the permit limits. A total of 275 kg of chemicals (Offshore Degreaser EF) were discharged to sea throughout 2024. Under the permit, a maximum of 1,556.6 kg of chemicals were permitted to be discharged to sea.

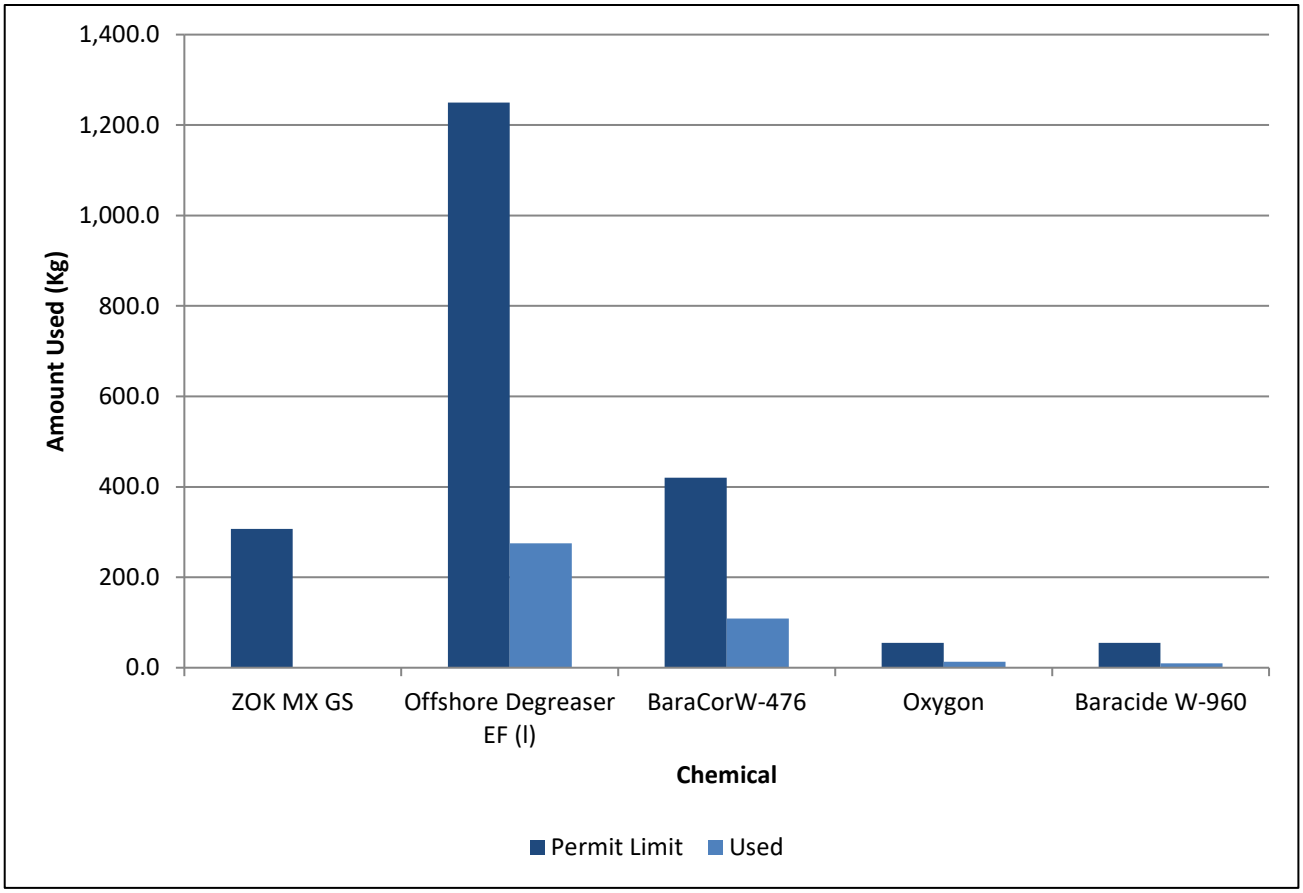

Figure 10: Wells and deck cleaning fluids chemical usage on 47/3 Bravo.

5.4 Waste

5.4.1 Total Waste Generated

The Rough Gas Facilities generated a total of 403.11 tonnes of waste throughout 2024, of which all but 0.06 tonnes were recovered (recycled or sent for treatment). From the total amount of waste generated, 249.29 tonnes were categorised as non-hazardous and 153.82 tonnes as hazardous waste. There was a slight decrease in waste produced in 2024 compared with previous years due to less intrusive work being completed during shutdown.

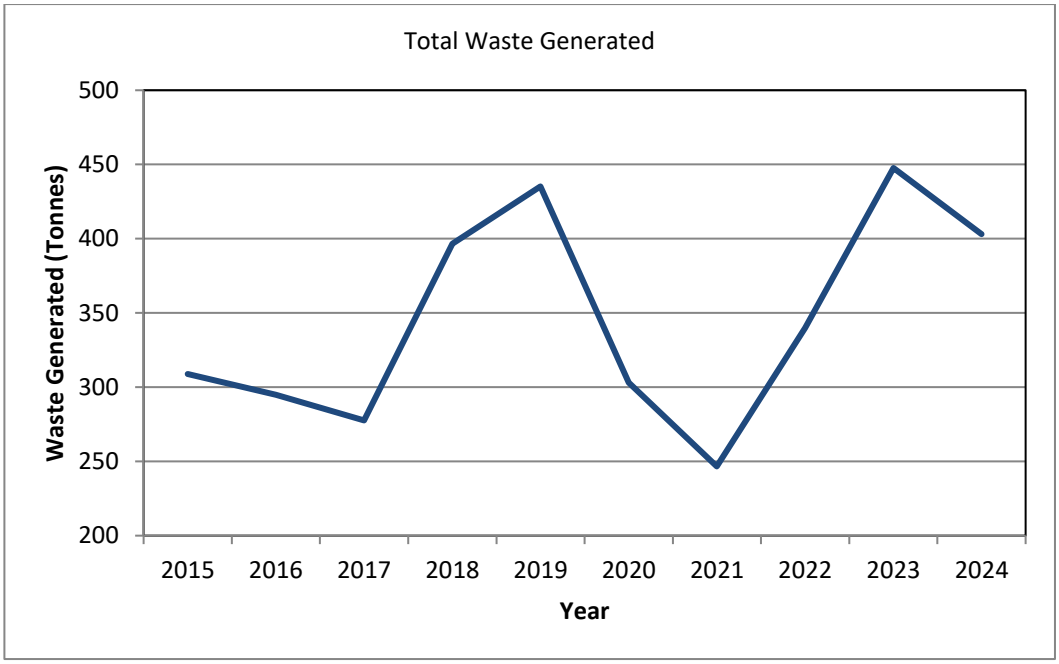

Figure 11: Total waste generated from the Rough Offshore Facilities (2015-2024).

5.4.2 Final Disposal/Recycling

Waste generated on the platforms are transferred to the support vessel to be offloaded ashore where it then goes to appropriate waste facilities. This waste is separated into either final disposal or recovered. From the total amount of waste generated, 403.05 tonnes were recovered (99.98%) in 2024. This is a continuation of the very high recovery rate seen for the past 5 years.

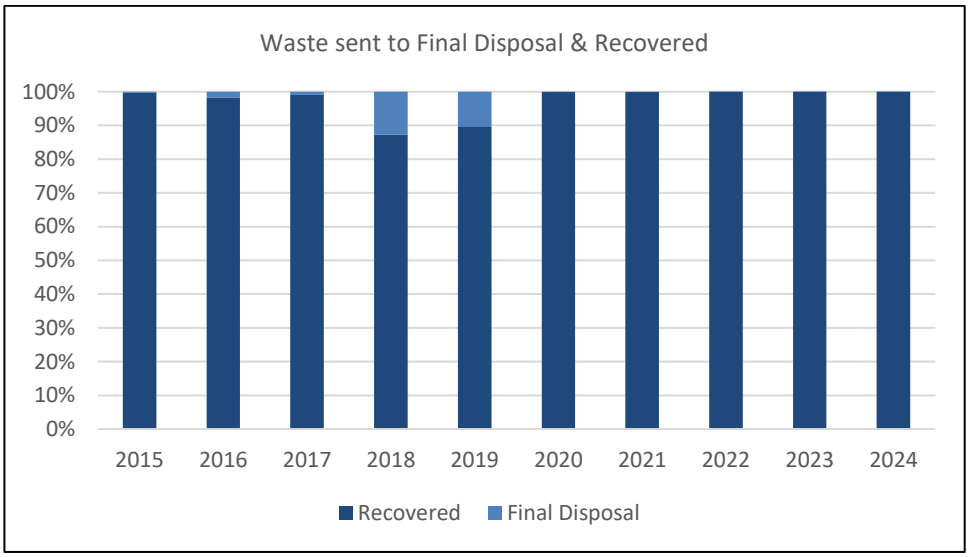

Figure 12: Breakdown of the destination of generated waste from the Rough Offshore Facilities.

5.4.3 Non-Hazardous/Hazardous Waste

The waste which leaves the platforms can also be categorised as non-hazardous or hazardous waste. Out of the total waste generated, 249.29 tonnes were categorised as non-hazardous and 153.82 tonnes as hazardous waste in 2024.

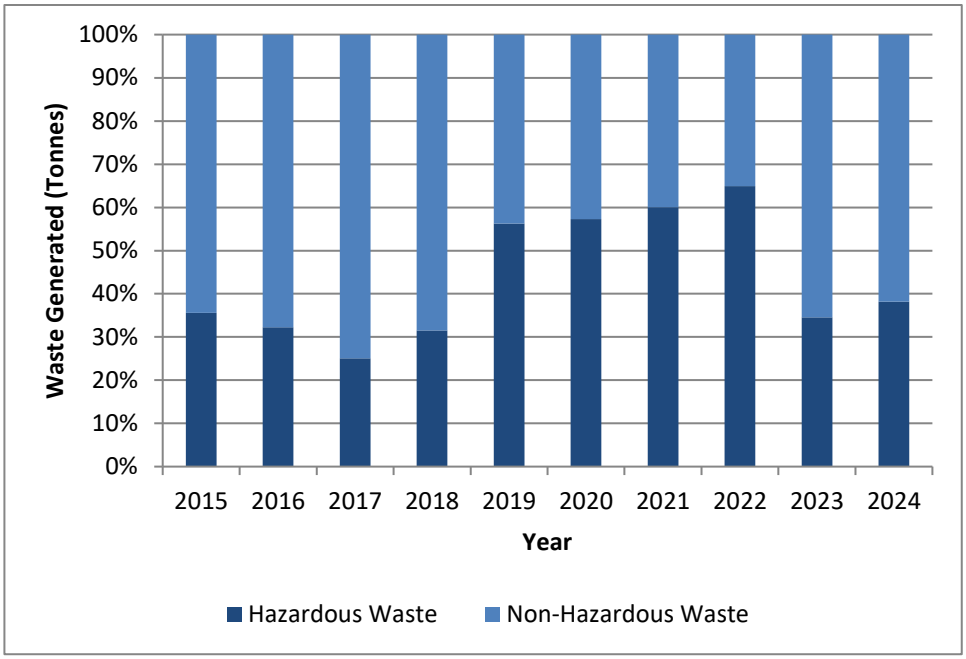

Figure 13: Historical Non-Hazardous and Hazardous Waste generated from the Rough Offshore Facilities.

6 Non-Conformities

Throughout 2024, CES+ have reported non-conformities to the environmental regulator and are discussed below.

6.1 Oil in Water

During 2024 the 47/3B platform produced gas on 136 days, of which, produced water was generated on 86 days. CES+ did not exceed the maximum daily concentration for oil in water but did exceed the monthly average oil in water concentration for the month of March during 2024. This was reported vis non-conformance notice IRS/2024/4305/OPPC.

Table 2 shows the monthly breakdown of the number of days produced water was generated, the number of maximum concentration non-conformities and the monthly oil in water average. A total of 9.36 kg of oil was released in 2024. The previous annual mass of oil released was 5.34 kg in 2023, which means there has been a slight increase from 2023 to 2024. This is likely due to an increase in oil from the reservoir near the end of its production.

Table 2: Summary of Oil in Water non-conformities.

	No. of Days Online	No. of Days Produced Water Generated	No. of Days of Maximum Concentration Non-Conformities	Oil in Water	
				Monthly Average (mg/L)	Mass of Oil Released (kg)
January	31	14	0	0.000	0.000
February	29	27	0	0.614	0.070
March	24	26	0	46.434	9.289
April	0	2	0	0.000	0.000
May	0	0	0	0.000	0.000
June	0	1	0	0.000	0.000
July	0	1	0	0.000	0.000
August	0	0	0	0.000	0.000
September	0	4	0	0.000	0.000
October	0	2	0	0.000	0.000
November	21	0	0	0.000	0.000
December	31	9	0	0.000	0.000
Annual Total	**136**	**86**	**0**	**23.15**	**9.36**

6.2 IR Standards and Calibration graphs

A condensate sample was taken and the Infra-Red Standards and Calibration graphs for the validation of the Oil in Water concentration against the GC-FID correlation results were developed on 11/09/2024, valid until 11/03/2025. In house results were recalibrated to ensure accurate analysis.

6.3 PON1's

In 2024, CES+ submitted 8 PON1s to the regulator with regards to non-regulated oil releases to sea. A review of these submissions is below:

Table 3: Summary of submitted PON1s during 2023.

Date	PON1 Ref	Category	Description	Min Quantity Released (t)	Max Quantity Released (t)	DESNZ Status
13-Jan-24	3900	Diesel	Oil was released from the drains tank due to unintentional activation of the deluge system in the drains tank area.	0.000192	0.00205	No Further Action Required
18-Mar-24	4217	Hydraulic Oil	Replacement seals fitted on the crane failed resulting in hydraulic oil spilling into the winch assemble and overflowing.	0.001128	0.01206	No Further Action Required
30-Mar-2025	4263	Oil	Very small, periodic release of unknown hydrocarbon rising to surface and rapidly dispersing.	0.000000	0.000002	No Further Action Required
31-May-24	4546	Oil	Very small, periodic release of unknown hydrocarbon rising to surface and rapidly dispersing.	0.000000	0.000002	No Further Action Required
15-Jul-24	4739	Hydraulic Oil	During an extended deluge test for the IVB, the deck drains backed up and overflowed, washing residual oil over side to sea.	0.005364	0.025338	No Further Action Required

26-Aug-24	4923	Diesel	The NRI wrap on a diesel return line failed and a release of diesel occurred, dripping into the sea.	0.015847	0.036256	No Further Action Required
03-Sep-24	4955	Condensate	Residual oil on the surface of the structural steelwork frame encasing a tote tank was washed into the sea by water droplets which formed on a damp day with light rain.	0.000000	0.000001	No Further Action Required
07-Sep-24	4973	Diesel	Residual diesel contamination on the deck was washed over the side of the deck into the sea during heaving rain.	0.000001	0.000008	No Further Action Required

7 2024 Audits

CES+'s management systems are highly developed with an operations management system (OMS) in place. The OMS identifies the potential direct and indirect effects associated with the platform and its operations and identifies those that are considered significant. The significance is determined in the context of the legislative and regulatory requirements, platform processes and potential emissions generated. The OMS defines a systematic approach to HSE Management and provides a documented system of procedures which are in place to ensure effective management of environmental and identification of safety related issues. Group-wide procedures and permitting requirements are integrated into local procedures on the platform. All elements of the OMS are regularly reviewed and independently audited by an accredited verification company on a periodic basis to ensure compliance to the accrediting standard.

An external ISO:14001 audit was completed in January 2024 from which only one minor non-conformance was identified regarding overdue document review periods.

8 Summary

During 2024, CES+ produced 899.54 Mscm of gas from the Rough Gas Facilities and exported it into the NTS via Easington Terminal and a further 707.32 Mscm was injected back into the reservoir for storage. The production of gas was in accordance with the regulated activities described within the Permits and Consents under which CES+ operate.

CES+ have reported 1 OPPC permit non-conformance to the regulator during 2024, which continues the downward trend in number of non-conformances annually. CES+ have implemented corrective and preventative actions to rectify and prevent recurrence of these events.

In 2025, CES+ will endeavour to continue operating within permitted limits and look for opportunities to improve their environmental performance and reduce their environmental impacts.

Appendix 1: Centrica Health, Safety, Environment and Security Policy

Centrica Health, Safety and Environment Policy

At Centrica our priority is to create an environment where an incident free workplace is possible, ensuring the wellbeing of our employees, the safety of our customers and the protection of the environment. All employees and business partners are required to comply with this policy and our commitments outlined below.

We are committed to:

- **Helping our customers** to move towards a low carbon future through our products and services
- **Assessing**, understanding and managing our HSE risks and impacts
- **Enabling** the creation of a positive culture holding each other accountable, helping us to: achieve our HSE goals; support business growth; and realise our vision of an incident free workplace and a low carbon future
- **Proactively** supporting employee health and safety, seeking ways to protect the environment, including the prevention of pollution, efficient use of resources and the reduction of waste and carbon emissions
- **Empowering and encouraging** personnel to work in a safe way, through effective consultation, to prevent injuries and ill-health
- **Intervening** if we believe that the work environment or task is unsafe or may cause environmental damage, or we see an unsafe act
- **Learning** from our successes and incidents, and freely sharing lessons with business partners
- **Working with stakeholders**, suppliers and business partners in the pursuit of good practice in HSE
- **Continually improving** and setting measurable objectives and targets in business plans to enhance HSE performance
- **Developing** and testing prioritised incident response and recovery plans to protect our people, the environment and minimize business impact
- **Ethically conducting our business** and complying with regulatory and other applicable requirements
- **Reviewing** our policy commitments and updating our policy at least annually.

Our HSE management system enables the delivery of these policy commitments, is structured in line with recognised good practice, and is routinely assured.
Our performance is reviewed regularly, and relevant results published.

Chris O'Shea
Group Chief Executive Officer

February 2023

centrica