



**ANNUAL PUBLIC  
STATEMENT**  
ENVIRONMENTAL  
MANAGEMENT  
SYSTEM 2019

**Petrofac Facilities  
Management Limited**



# INTRODUCTION

This report is Petrofac Facilities Management Limited's 2019 annual public statement for environmental management, covering our UK Operations.

Prepared in line with the reporting requirements of the UK's Department for Business, Energy and Industrial Strategy, it meets the requirements of the Oslo Paris (OSPAR) Convention Recommendation 2003/5. This report outlines our Environmental Management System (EMS) and focuses on our 2019 environmental performance.

## WORKING RESPONSIBLY

Our EMS was developed alongside our Health, Safety, Security and Environment framework and the ISO 14001 standard for environmental management. It enables us to manage the environmental impacts arising from our activities and is based on the internationally approved 'Plan-Do-Check-Act' process. This ensures we have the philosophy, procedures and methods in place to manage significant environmental risks throughout the life cycle of our projects.

As a provider of managed solutions to our clients in the UKCS we fulfil the role of 'Operator' on behalf of the asset owner. As a result, our EMS has been designed to support our operating responsibilities:

- The environmental goals for the prevention and elimination of pollution from offshore sources and the protection and conservation of the maritime area against other adverse effects of offshore activities
- Provision of trained emergency and oil spill responders and specialist emergency response facilities
- Continual improvement in environmental performance

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**Our vision is to reach  
Horizon Zero; a future  
with no accidents or incidents**



# THINKING DIFFERENTLY ABOUT DELIVERY

As a leading service provider to the oil and gas production and processing industry, we design, build, operate and maintain oil and gas facilities.

We think differently about delivery. By providing standalone or integrated services we align our approach to meet our clients' operating strategies and project objectives, unlocking significant value.

One example of this is our innovative Operator models, which have evolved from the Duty Holder service we pioneered in 1997, whereby we take responsibility for the Safety Case on behalf of a client.





# OUR OPERATOR MODELS

Following the introduction of the 2015, Safety Case Regulations, our outsourced Duty Holder model evolved to incorporate Installation Operator (including Duty Holder) responsibility; to manage the environmental aspects of an installation.

Responsibility for wells and pipelines (Well Operator and Pipeline Operator) can be combined within one outsourced model called Service Operator.

## SERVICE OPERATOR

**Anasuria Operating Company (AOC), Anasuria cluster and FPSO, UKCS**

During 2019, as Service Operator for AOC we managed the Anasuria FPSO and associated pipelines. We have focused on providing an integrated and aligned approach to the operation and development of the cluster to support our client in its objective to extend the life of field.

## WELL OPERATOR

**Tullow Oil, i3 Energy, Hurricane Energy, Siccar Point Energy and Anasuria Operating Company**

We were appointed Well Operator for five separate drilling campaigns in the UKCS, utilising four semi-submersible drilling rigs and one jack-up drilling rig, all of which are documented within this statement.

## INSTALLATION OPERATOR

**FPF-1, Hewett, Irish Sea Pioneer, Kittiwake, and Schooner and Ketch platforms**

Throughout 2019, our Installation Operator portfolio included the FPF-1 Floating Production Facility and the Hewett, Irish Sea Pioneer, Kittiwake, and Schooner and Ketch platforms.



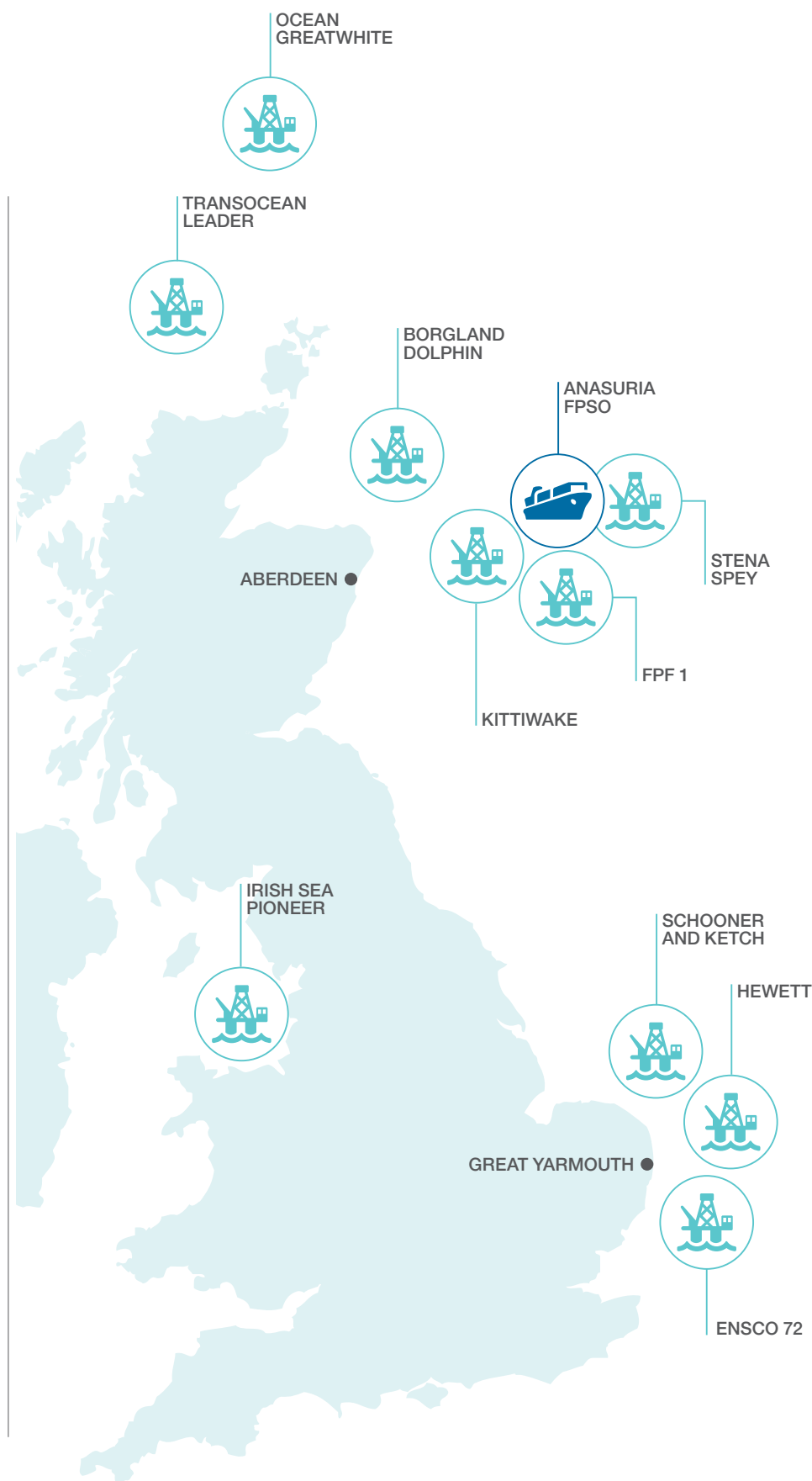
# OUR OFFSHORE OPERATIONS

On behalf of their owners, we currently operate a range of platforms and undertake offshore oil and gas production activities including:

- Non-producing intervention vessel operation
- Oil and gas production platform operation
- Late-life platform operations
- Drilling activities with third-party rig provision

Under the requirements of this disclosure, the UKCS Operator responsibilities and UKCS assets highlighted within this statement include:

- **Service Operator (including Installation Operator) – the Anasuria FPSO and Irish Sea Pioneer, Hewett, Kittiwake, and Schooner and Ketch platforms**
- **Well Operator – Borgland Dolphin, EnSCO 72, Ocean GreatWhite, Stena Spey and Transocean Leader drilling rigs**



## SERVICE OPERATOR (INCLUDING INSTALLATION OPERATOR)



### Anasuria FPSO

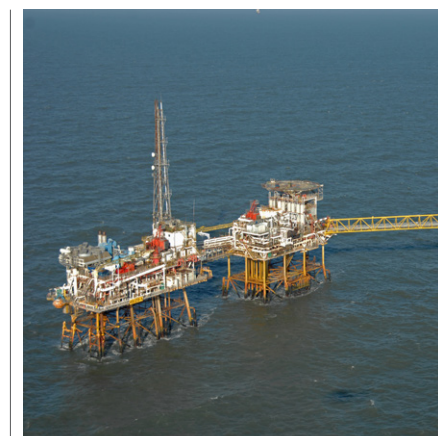
The Anasuria FPSO is owned by Anasuria Operating Company, a joint venture between Hibiscus Petroleum Berhad and Ping Petroleum Limited. It is located 175km east of Aberdeen.

In 2016, Petrofac was awarded a Service Operator contract for the FPSO and associated cluster, with responsibility for the installation, wells and pipelines, with exception of the Cook well.



### FPF-1

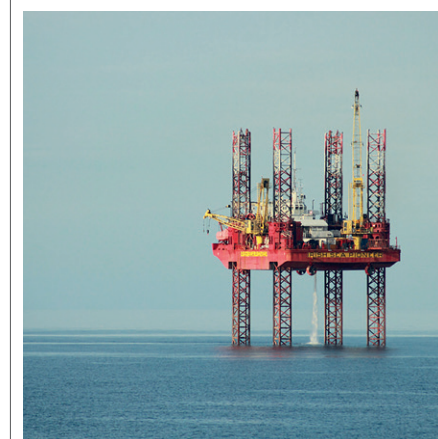
The FPF-1 is a Floating Production Facility, located in the Greater Stella Area in the Central North Sea, that has been in operation since 2016. Petrofac has been Duty Holder for FPF-1 on behalf of Ithaca Energy since 2011 and became Installation Operator in August 2018.



### Hewett

Petrofac has been Duty Holder for the Hewett platforms since 2003 on behalf of current and previous owners Eni and Tullow Oil respectively. In January 2018, Petrofac became Installation Operator.

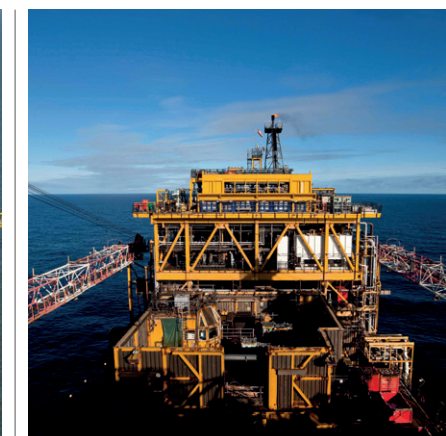
Located in the Southern North Sea, there are four platforms: The Hewett Complex (48/29Q, AP and A-FTP), 48/29 B, 48/29 C and 52/5A. The Complex is permanently manned whilst 48/29 B, 48/29 C and 52/5A are Not Permanently Attended Installations (NPAI).



### Irish Sea Pioneer

Petrofac has been Installation Operator of the Irish Sea Pioneer since 2015, prior to which Petrofac had been Duty Holder of the asset since 2006.

The non-producing mobile platform is owned by ENI and provides intervention services to ENI's operations in the Liverpool Bay area.



### Kittiwake

Petrofac has been the Duty Holder for the Kittiwake, a fixed steel jacket platform in the Central North Sea, since 2004, on behalf of current and previous owners EnQuest, Centrica and Venture Production respectively.

In June 2017, Petrofac became Installation Operator and assumed responsibility for the environmental performance for the asset.



### Schooner and Ketch

Schooner and Ketch, located in the fields of the same name in the Southern North Sea, are normally unmanned gas platforms. Petrofac has been Duty Holder for the Schooner and Ketch assets since 2005 on behalf of current and previous owners Faroe Petroleum and Tullow Oil respectively.

In March 2017, Petrofac became Installation Operator and assumed responsibility for the environmental performance for assets.



# WELL OPERATOR



## Borgland Dolphin

Petrofac was the appointed Well Operator on behalf of the licensee i3 Energy for a three well drilling campaign in the Outer Moray Firth / Central North Sea. The semi-submersible drilling rig, owned by Dolphin Drilling, carried out the work in the Liberator and Serenity fields.



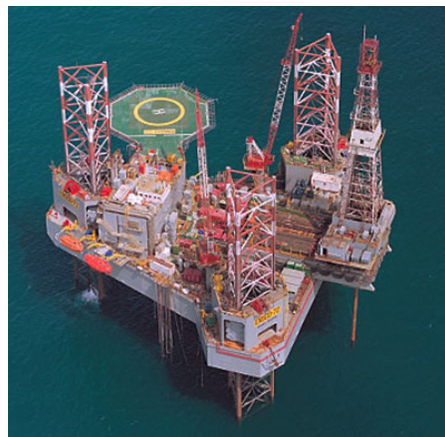
## Ocean Great White

Petrofac was the appointed Well Operator on behalf of the licensee Siccar Point Energy for a three well drilling and abandonment campaign West of Shetland. The semi-submersible drilling rig, owned by Diamond Drilling, carried out the work in the Blackrock, Lyon and Cambo fields.



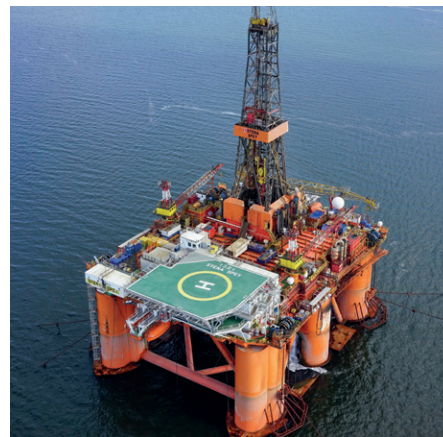
## Transocean Leader

Petrofac was the appointed Well Operator on behalf of the licensee Hurricane Energy for a three well drilling campaign in the Greater Warwick Area. The semi-submersible drilling rig, owned by Transocean, carried out the work in the Warwick and Lincoln fields.



## Ensco 72

Petrofac was the appointed Well Operator on behalf of licensee Tullow Oil for a three well plug and abandonment campaign in the Southern North Sea. The jack-up drilling rig, owned by Ensco Plc, carried out the work in the Cameron, Deben and Thurne fields.



## Stena Spey

Petrofac was the appointed Well Operator, on behalf of the licensee Anasuria Operating Company, for a one-well drilling campaign in the Central North Sea. The semi-submersible drilling rig, owned by Stena Drilling, carried out the work in the Anasuria field.



## PETROFAC LIMITED ENVIRONMENTAL POLICY

### Vision

Petrofac will be recognised as a company that maximizes energy efficiency, minimizes greenhouse gas emissions from its activities and conducts business in an environmentally responsible manner.

### Commitment

The Petrofac Board of Directors has ultimate responsibility for environmental performance and is committed to the achievement of environmental excellence. Petrofac and its business units are therefore committed to:

- Conducting its business in an environmentally responsible manner, consistent with its 'Horizon Zero' initiative which aims to eliminate all incidents within the company
- Promoting a strong culture of leadership in environmental matters
- Encouraging all employees to share our environmental commitments and take personal responsibility for protecting the environment
- Complying with all applicable environmental laws, regulations, relevant standards, and compliance obligations
- Minimising our impact on the environment through pollution prevention, minimising waste and emissions and the efficient use of energy and other resources
- Transparency in the reporting of the Company's environmental performance and sharing of knowledge
- Setting objectives and targets for continual improvement with auditing and monitoring of performance

### Objectives

To meet this commitment at Group level Petrofac will:

- Develop and maintain Petrofac minimum standards and expectations
- Publish regular performance reports and openly discuss our environmental performance with internal and external stakeholders
- Periodically review the suitability and effectiveness of this policy, our management systems, targets and objectives

Each Petrofac business unit will:

- Provide suitable resources for the protection of the environment
- Develop and maintain environmental management systems that comply with ISO 14001, the International Standard for Environmental Management Systems
- Provide appropriate training to all employees to enable them to carry out their work with due respect and care for the environment
- Engage with clients, contractors and suppliers to deliver a high standard of environmental performance

### Responsibility and implementation

Environmental protection is a line responsibility that starts with the Group Chief Executive and flows down through the line management structure to front line employees performing work. Every leader at Petrofac is responsible for proactively leading the management of risks to the environment with their teams. Every Petrofac employee is responsible for making themselves aware of the risks to the environment in their work area and to proactively play their part in reducing these risks. All employees are empowered to speak up if they have any environmental concerns.

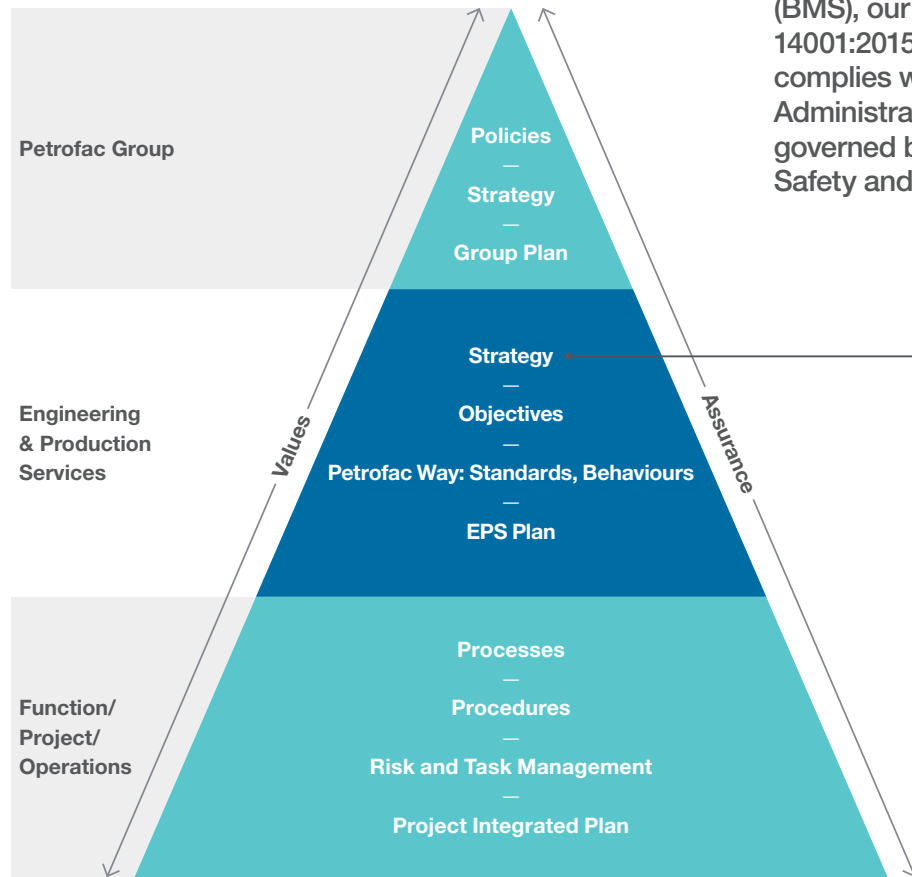
Ayman Asfari, Group Chief Executive

January 2020



# ENVIRONMENTAL MANAGEMENT SYSTEM

## HSE MANAGEMENT STRATEGY



As part of our Business Management System (BMS), our EMS is certified to the ISO 14001:2015 International Standard, and complies with the Oil Spill Prevention, Administration and Response Fund. It is governed by the Petrofac Group Health Safety and Environment Management Strategy.

### HSE MANAGEMENT STRATEGY ELEMENTS

1. Leadership and accountability
2. People and competence
3. Subcontractors, suppliers and partners
4. Customers, products and services
5. Community and stakeholders
6. Risk assessment and management
7. Design and construction
8. Operations and maintenance
9. Management of change
10. Information and documentation
11. Incident investigation and analysis
12. Crisis and emergency management
13. Assessing and improving effectiveness

Our EMS is flexible enough to maintain continuity with existing practices during the transfer of platforms to the Petrofac system, whilst taking on board best practice where identified which is then shared across other assets.

# MANAGING OUR IMPACT ON THE ENVIRONMENT

Specific areas of our offshore operations require daily focus to ensure their impact on the environment is managed effectively. These include:

## DISCHARGES TO SEA

### OIL IN WATER

Water is extracted from wells, along with oil and gas. The water, known as produced water, is then separated from the oil and treated. Although treatment removes most of the oil from the water, residual traces are still discharged. These traces are regulated and released under permitted conditions.

### DRILL CUTTINGS DISCHARGE

Drill cuttings and fluids discharged from drilling operations can also contain residual oil associated with the formation.

### CHEMICAL DISCHARGES

Prior to approval and discharge for use offshore, chemicals are subjected to a risk assessment. The potential impact from chemical discharges is graded using the ranking system below:

COLOUR BANDING		INITIAL OFFSHORE CHEMICAL NOTIFICATION SCHEME (OCNS) GROUPING	
GOLD	Lowest hazard	Initial grouping	
SILVER	↓	A	
WHITE		B	
BLUE		C	
ORANGE		D	
PURPLE		E	
	Highest hazard		

## ATMOSPHERIC EMISSIONS

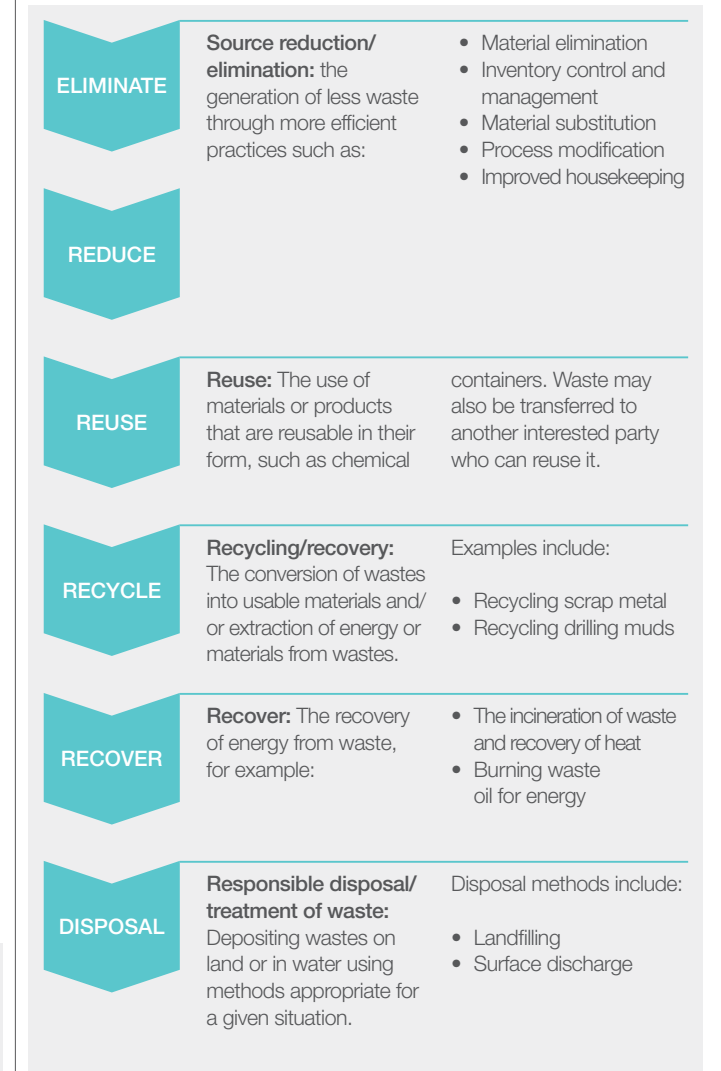
The combustion of diesel and gas to generate power and the burning of flare gas creates atmospheric emissions of Carbon Dioxide (CO<sub>2</sub>) and other combustion products including:

- Nitrous oxides
- Sulphurous oxides
- Carbon Monoxide (CO)
- Methane (CH<sub>4</sub>)
- Other Volatile Organic Compounds (VOCs)

During activities on the assets, refrigerant gases are used offshore, primarily to support living conditions and equipment cooling. This activity is regulated and reported on annually.

## WASTE MANAGEMENT

Waste generated offshore is managed to allow maximum reuse or recycling of materials before being treated, incinerated or disposed to landfill. Petrofac follows the waste management hierarchy below:



## PETROLEUM OPERATIONS NOTICE AND NON-COMPLIANCE REPORTING

All notices and non-compliance are recorded within Petrofac's incident management system, detailing the circumstances, investigation, outcomes and actions. The system is also used for lesson sharing and incident trending to assist with continuous improvement.

### PETROLEUM OPERATIONS NOTICE

Any spill to sea of oil or chemical is reported to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) using the Petroleum Operations Notice (PON 1).

The loss of any objects to sea which may have an impact on the environment or sea users are reported to OPRED using a PON 2 Notice.

### NON-COMPLIANCE

A non-compliance against any of the permit conditions is reported using the appropriate format to OPRED.



# ENVIRONMENTAL OBJECTIVES AND TARGETS

## 2019 OBJECTIVES

## 2019 ACHIEVEMENTS

Integration of EMS with new Business Management System governance framework	Fully integrated with the Business Management System and managed through Power BI
Environmental data standardisation across installation operations	Commenced work with Petrofac's digital team to produce a data set for monitoring and reporting
Develop environmental hazard toolkit	Identified criteria for toolkit and process for delivery. Practical delivery of product is ongoing
Environmental input into leadership engagement process	Work carried out with Petrofac Group on assurance across operations

## CONTINUOUS IMPROVEMENT

In 2020, Petrofac will maintain ISO 14001 Certification across all operated assets and extend in to new areas as operational changes require. It is also planning to enhance the use of digital technology in support the United Nations' Sustainable Development Goals.

Identify methane emissions reduction opportunities	Support preparation of energy reduction and efficiency plans for identified energy saving opportunities
Support Petrofac in new areas of energy diversification and transitional opportunities	Work with Petrofac Group to raise sustainability awareness across the business





# ENVIRONMENTAL PERFORMANCE

## ANASURIA FPSO

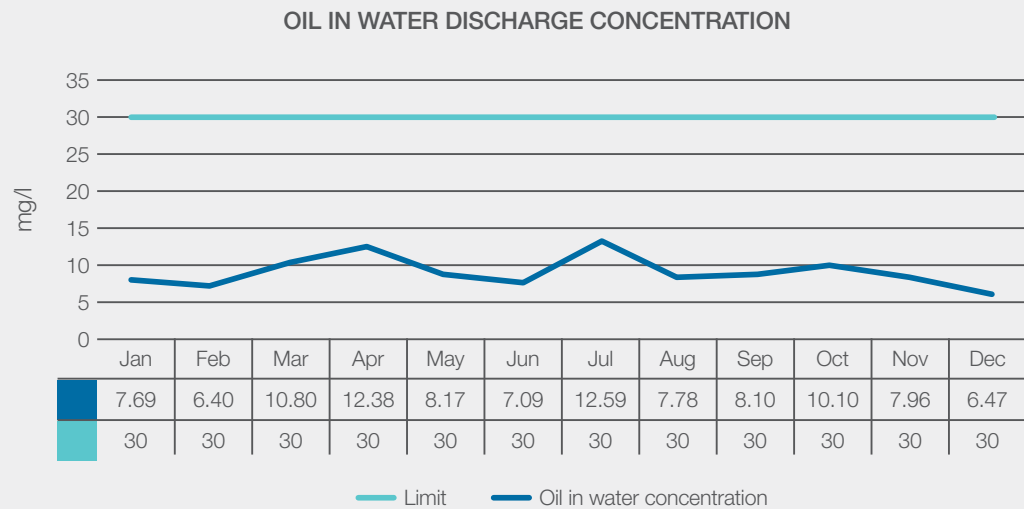
The environmental permits in place for the Anasuria FPSO are associated with oily water discharges to sea, offshore chemical use and discharge, and atmospheric emissions from power generation, flaring and use of refrigerant compounds.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

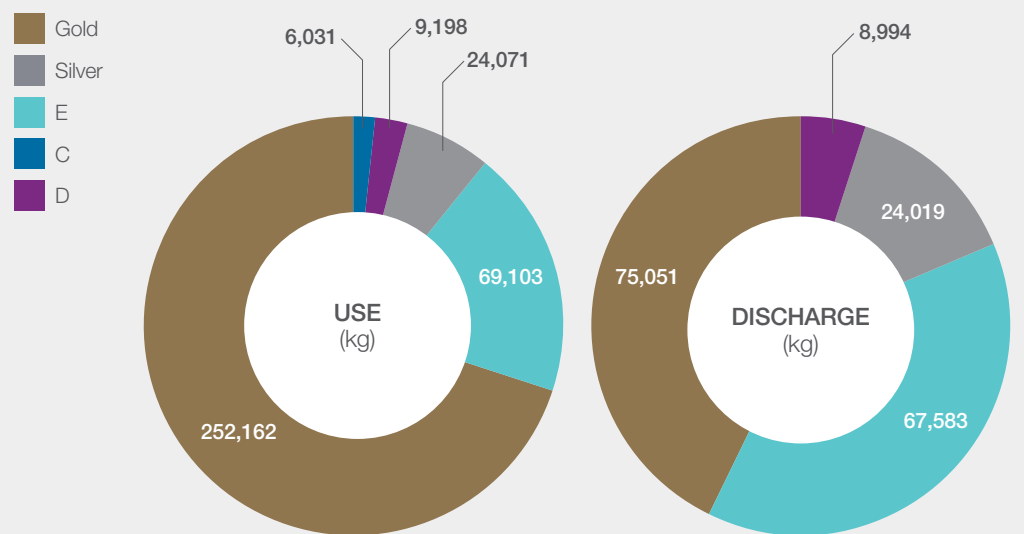
Water discharges are monitored and reported in accordance with the Oil Pollution, Prevention and Control Permit. The average oil in water concentrations over both discharges (produced water and slops) for the period was 8.64 mg/l.

The total volume of water and mass of oil discharged over the period of operation was 950,810 m<sup>3</sup> and 8,212 kg of oil.



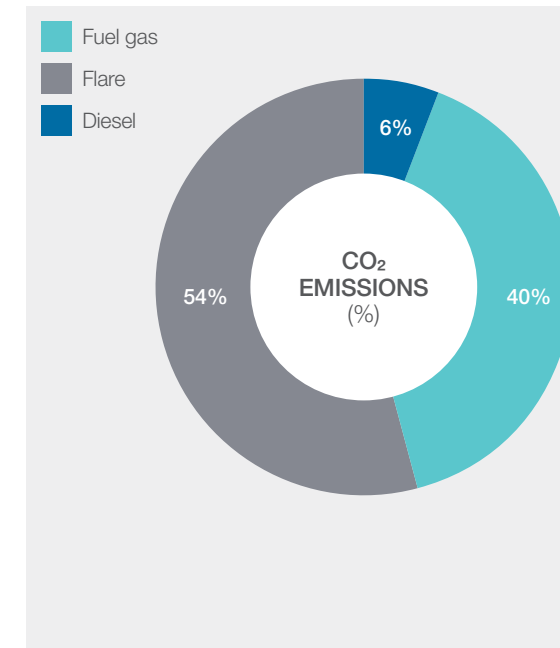
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Anasuria FPSO are in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.



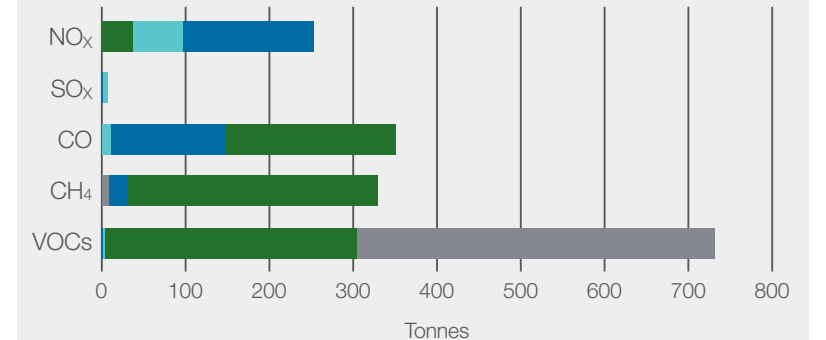
### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources are flaring and venting gas. 151,397 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes in 2019.



Other combustion emissions reported through the Environmental Emissions Monitoring System (EEMS) can be found below:

#### EMISSIONS BY SOURCE



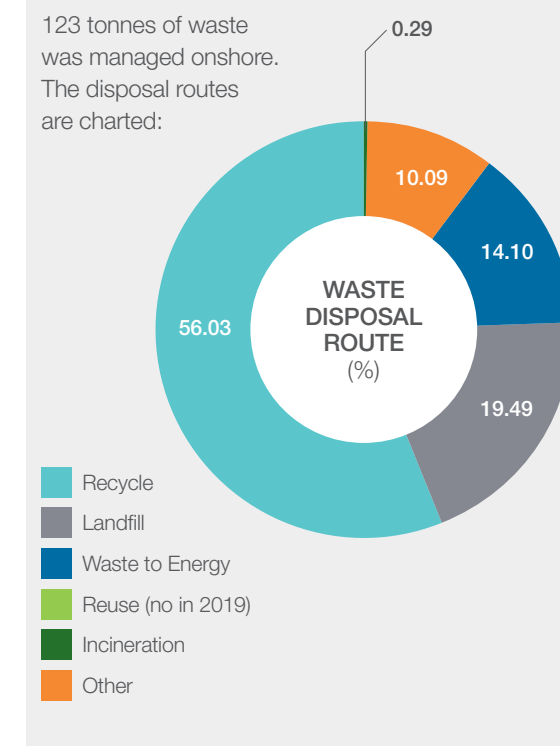
Source	VOCs	CH <sub>4</sub>	CO	SO <sub>x</sub>	NO <sub>x</sub>
Flare	301.25	301.25	201.84	0.39	36.15
Diesel	1.71	0.17	10.51	4.98	60.67
Fuel Gas	0.82	20.98	136.85	0.29	156.28
Vent	428.31	7.28	0	0	0

There are three hydrochlorofluorocarbon (HCFC) refrigerant compounds and two non HCFC refrigerant gases in use on the Anasuria FPSO. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	1.61	0.00	1,430	0.00
HFC-404a	17.96	0.00	3,922	0.00
HFC-417a	30.40	1.54	2,729	3.61
HC-600a (Isobutane)	0.30	0.00	3.00	0.00
R407f	23.00	0.00	42	0.00
<b>Total</b>	<b>72.97</b>	<b>1.54</b>		<b>3.61</b>

### WASTE MANAGEMENT

123 tonnes of waste was managed onshore. The disposal routes are charted:



### REPORTS AND NOTIFICATION

During 2019 there were no hydrocarbon releases. There were six unpermitted discharge of chemical reported and closed out through the PON 1 reporting system. There was one PON 2 notification made for the loss of the inspection tool used by the ROV during the subsea turret inspection operations. There were no non-conformances against any other permits reported.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Loss of methanol during operations of XT (subsea)	Methanol	1.519
Hydraulic oil loss during HFL replacement (subsea)	Hydraulic oil	0.021
Methanol loss during stabplate replacement (subsea)	Methanol	0.004
Methanol loss during UTA plate removal (subsea)	Methanol	0.001
Release of heating medium to the slop tank (topside)	TEG/Biocide/Corrosion Inhibitor	0.271
Release of heating medium to the slop tank (topside)	TEG/Biocide/Corrosion Inhibitor	0.041
<b>Total</b>		<b>1.857</b>



# ENVIRONMENTAL PERFORMANCE

## FPF-1

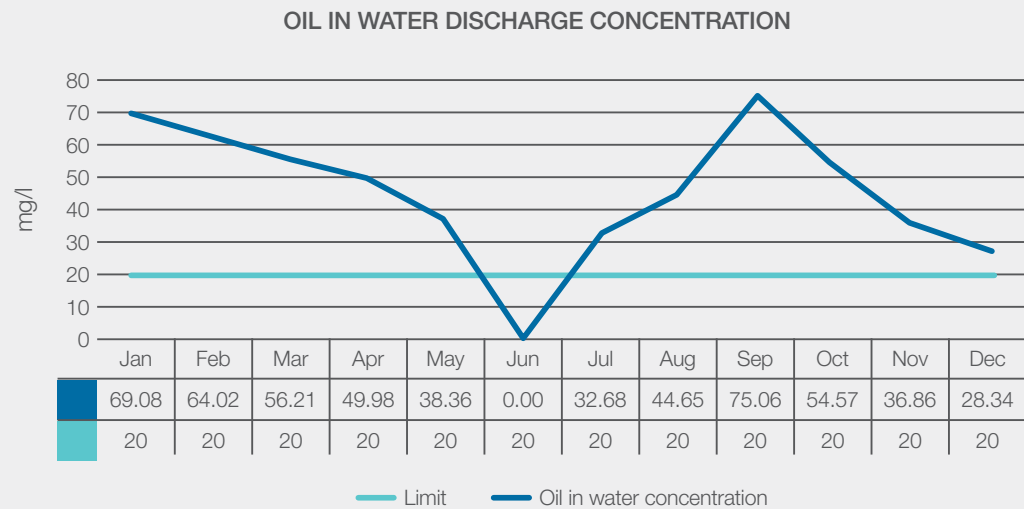
The environmental permits in place for the FPF-1 are associated with oily water discharges to sea, offshore chemical use and discharge, and atmospheric emissions from power generation and flaring. The permits were transferred to Petrofac Facilities Management from Ithaca Energy, following transition to Installation Operator under the Offshore Safety Directive on 1 August 2018.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

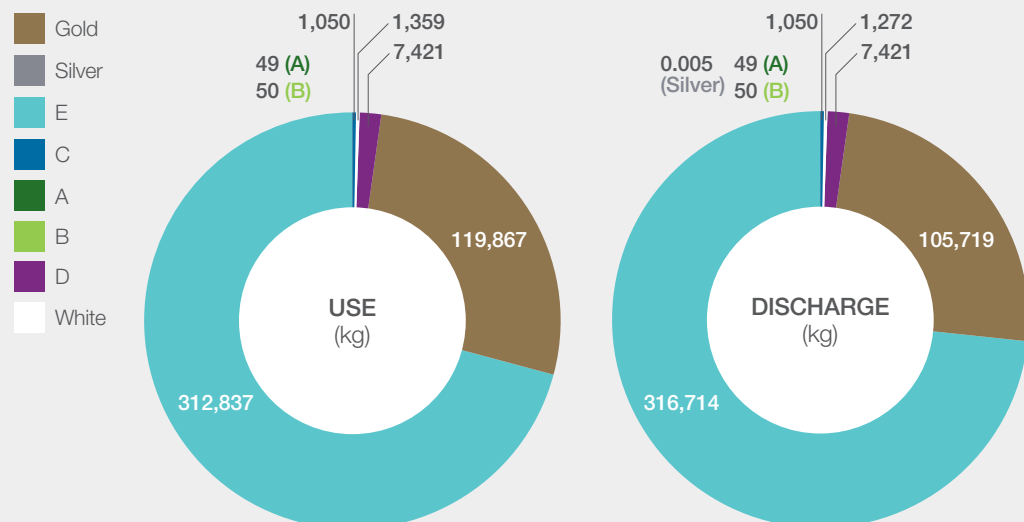
Water discharges are monitored and reported in accordance with the Oil Pollution, Prevention and Control Permit. The average oil in water concentrations for the period was 49.48mg/l. The oil in water concentrations were above the permitted average for each month in 2019 due to issues with the incumbent wax inhibitor partitioning to the water phase when applied subsea. The wax inhibitor was replaced in October with a more suitable product for the process, which resulted in a reduction of the average oil in water (OIW) results.

The total volume of water and mass of oil discharged over the period of operation was 75,543m<sup>3</sup> and 3,738kg of oil.



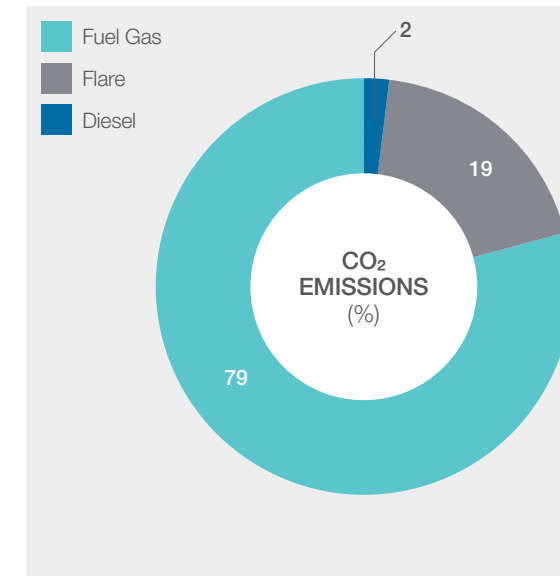
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the FPF-1 asset are in the E and Gold categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

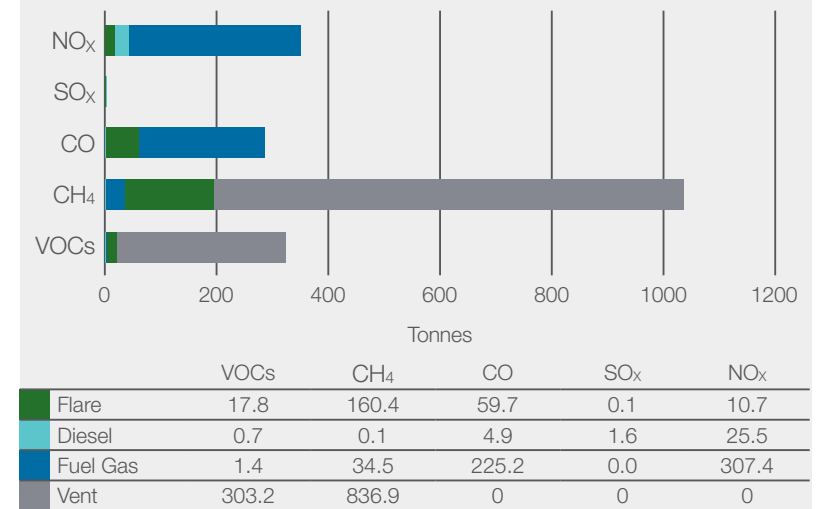


### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources are flaring and venting gas. 128,221 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes. Other combustion emissions were reported through the Environmental Emissions Monitoring System (EEMS).



#### EMISSIONS BY SOURCE

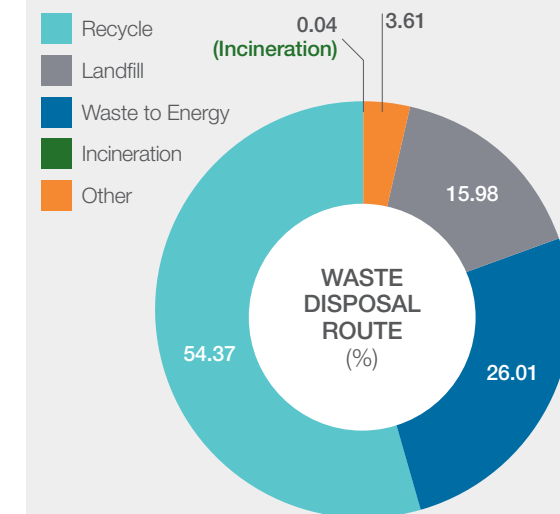


There are four hydrochlorofluorocarbon (HCFC) refrigerant compounds in use on the FPF-1. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	3	0	1,430	0
HFC-404a	48	7	3,922	27
HFC-407c	862	0	1,774	0
HFC-417a	5	0	2,346	0
HC-600a (Isobutane)	0	0	3	0
<b>Total</b>	<b>918</b>	<b>7</b>	<b>9,475</b>	<b>27</b>

### WASTE MANAGEMENT

267,701 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

In 2019 there were no releases of oil reported. There were four unpermitted discharge of chemical reported and closed out through the PON 1 reporting system.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Cooling medium release through burst disc	TEG and Corrosion inhibitor	0.566 and 0.0025
Cooling medium release through burst disc	TEG and Corrosion inhibitor	3.3 and 0.0075
Cooling medium release through burst disc	TEG and Corrosion inhibitor	0.954 and 0.00325
Cooling medium release through burst disc	TEG and Corrosion inhibitor	0.3465 and 0.00325

A total of 13 non-compliances with permit conditions were submitted to OPRED during August to December 2019:

Permit	Non-Compliance	No.
Oil discharge permit	Monthly discharge limit exceeded	11
Oil discharge permit	Single OIW sample measuring >100mg/l	19
Chemical permit	Over 110% usage of Asphaltene dissolver ACP21000A during the wax inhibitor changeout work scope	1



# ENVIRONMENTAL PERFORMANCE

## HEWETT

The environmental permits in place for the Hewett Field Complex, blocks 48/29AP, 48/29 B, 48/29 C and 52/5A are associated with oily water discharges to sea, offshore chemical use and discharge, and atmospheric emissions from power generation.

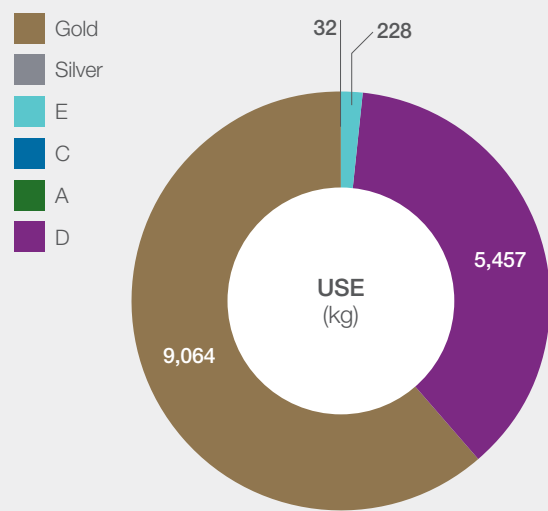
### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

No produced water was discharged to sea in 2019. A number of trials took place, however this did not include discharges produced to the environment.

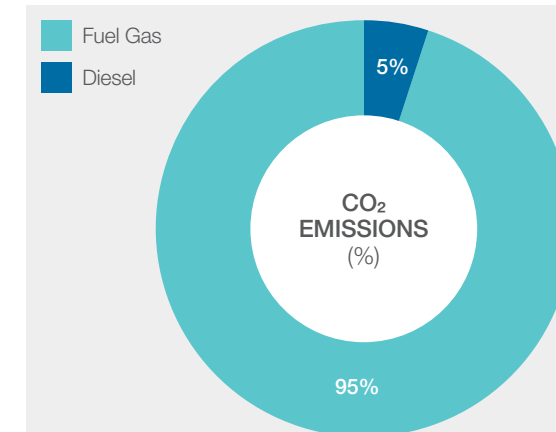
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Hewett Complex, blocks 48/29AP, 48/29 B, 48/29 C and 52/5A are in the Gold category, used during flushing and cleaning operations, therefore no discharge to sea. The category D chemical, Aqualink, is the only chemical discharged. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

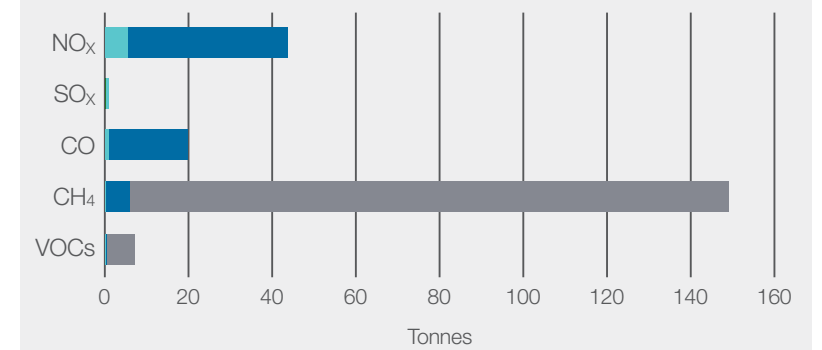


### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. 17,646 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes.



#### EMISSIONS BY SOURCE



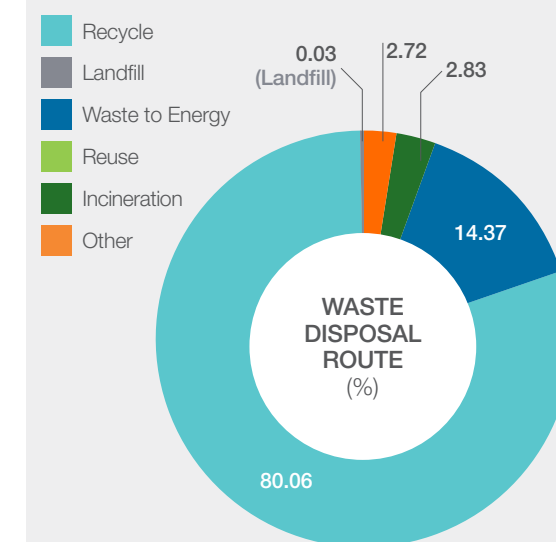
Other emissions were reported through the Environmental Emissions Monitoring System.

There are four hydrochlorofluorocarbon (HCFC) refrigerant compounds in use on the Hewett Complex. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	2.4	0	1,430	0
HFC-227ea	66	0	3,220	0
HFC-407c	7.5	0	1,774	0
HFC-422d	6.5	0	2,729	0
<b>Total</b>	<b>119.45</b>	<b>0</b>	<b>-</b>	<b>0</b>

### WASTE MANAGEMENT

167.9 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During 2019 there were two releases of hydrocarbons reported and closed out through the PON 1 reporting system, and one reported discharge reported through the PON 1 reporting system. There was no unpermitted discharge of chemical reported. No non-compliances with permit conditions were submitted to OPRED during the reporting period.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (litres)
Hydraulic leak to sea	Hydraulic leak	0.5
Condensate release	Condensate and water mix	0.1
Aqualink release	Used for leak testing on subsea well. Discussed and agreed for use with BEIS prior to use and discharge	30

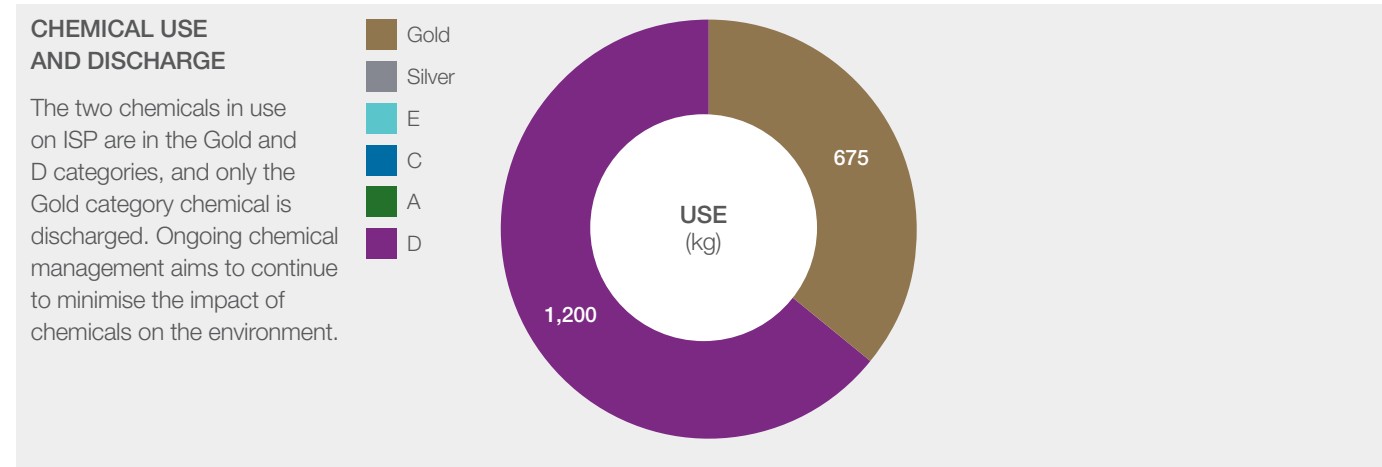


## ENVIRONMENTAL PERFORMANCE

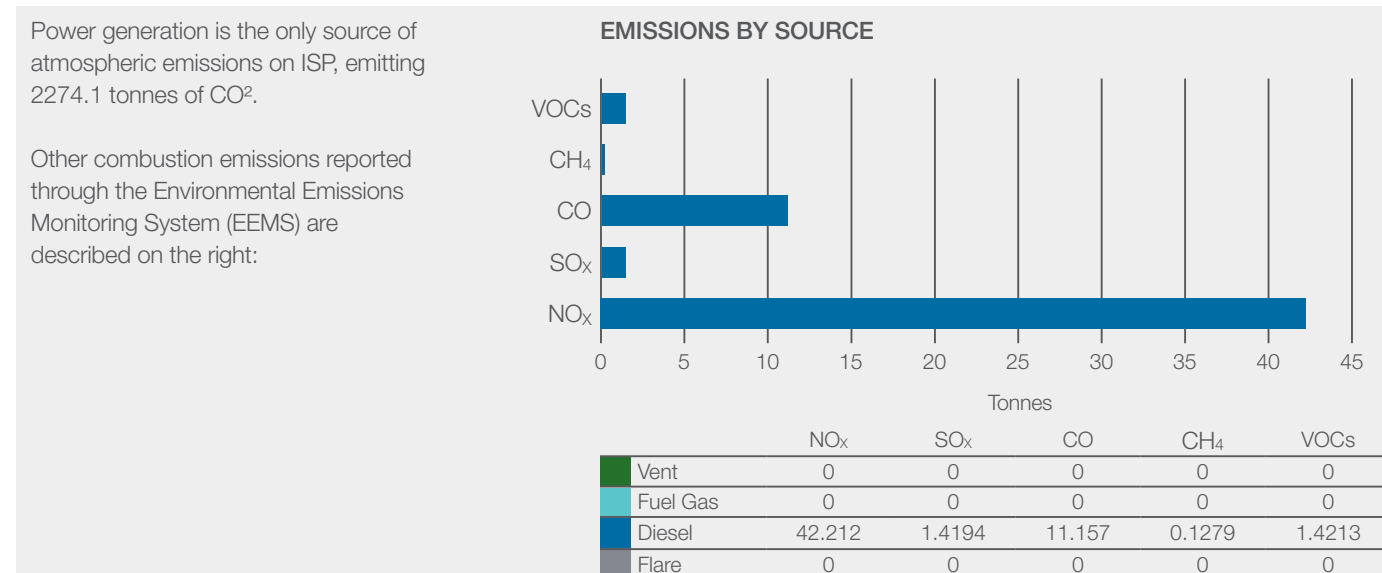
# IRISH SEA PIONEER

The Irish Sea Pioneer (ISP) has no production capability and is powered by diesel generators. Emissions to the environment are related to the maintenance of the accommodation and movement of the vessel. The environmental permits in place for ISP are associated with offshore chemical use and discharge, and atmospheric emissions from power generation.

### DISCHARGES TO SEA



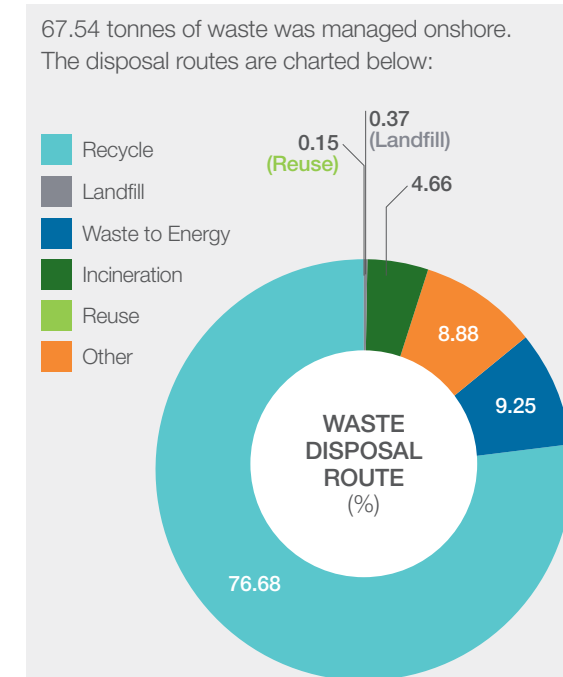
### DISCHARGES TO ATMOSPHERE



There are two hydrochlorofluorocarbon (HCFC) refrigerant and two non-HCFC refrigerant compounds in use on the ISP. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-143a	51.15	0.00	4,470	0.00
HFC-404a	25.30	0.00	3,922	0.00
HC-600a	0.03	0.00	3.00	0.00
R717	0.25	0.00	0.00	0.00
<b>Total</b>	<b>76.73</b>	<b>0.00</b>	<b>-</b>	<b>0.00</b>

### WASTE MANAGEMENT



### REPORTS AND NOTIFICATION

During 2019 there were no releases of chemicals reported. There were two unpermitted discharges of hydrocarbon reported through the PON 1 reporting system

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (litres)
Oil spill to sea from excess oil under deck grating, creating an oil sheen	Oil	0.3
Diesel fuel leak to sea during Bunkering Operations	Oil	0.425



# ENVIRONMENTAL PERFORMANCE

## KITTIWAKE

During 2019, the following environmental permits and consents were in place for activities undertaken on the Kittiwake platform:

- > Chemical permit for chemical use and discharge
- > GHG permit for qualifying combustion activity resulting in carbon dioxide emissions (CO<sub>2</sub>)
- > Flare consent for flaring operations
- > OPPC permit for oily discharges to sea (produced water and solids i.e. sand/scale)
- > PPC permit for non-flare combustion operations and energy efficiency
- > Vent consent for cold venting operations

### SIGNIFICANT CHANGES IN OPERATION

During Q3 2019, a replacement Scolty Crathes production flow line was successfully commissioned, allowing the Crathes and Scolty wells to be flowed without restriction. As a result, a step change in production was realised.

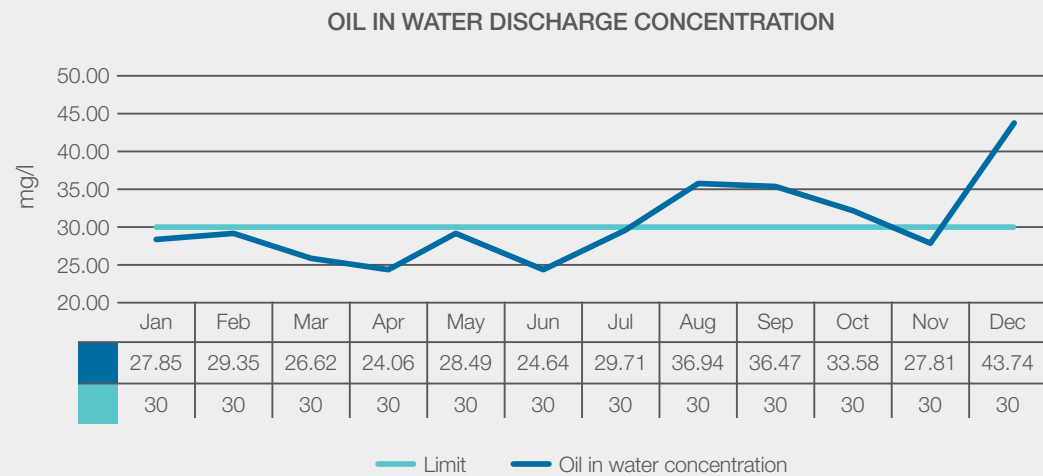
During Q3 and into Q4, SEGAL gas pipeline import restrictions resulted in periods of increased Kittiwake flaring as it was not possible to export gas onshore, which is the normal Kittiwake mode of operation.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

Water discharges are monitored and reported in accordance with the Kittiwake Oil Pollution, Prevention and Control Permit. The annual average dispersed oil in produced water discharge concentration from Kittiwake for the period was 29.8 mg/l. There were no oily solids discharged to sea.

The total volume of produced water discharge to sea in 2019 was 1,302,624m<sup>3</sup> with an associated dispersed oil mass of 39 tonnes.

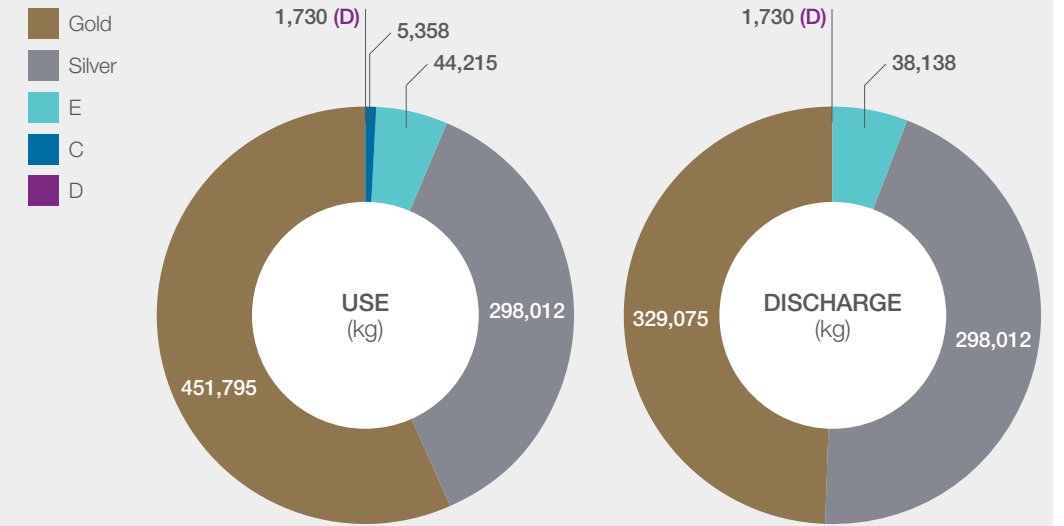


During the second half of 2019, oil in water performance deteriorated due to a number of factors, including:

- Production restart following the planned summer outages
- Unplanned FPS outages impacting process stability
- Restart of the Crathes and Scolty wells following prolonged periods of shut-in
- Prolonged period of compression system outage that resulted in a reduction in well stock, impacting process stability and oil in water separation effectiveness
- Periods of Grouse slugging impacting topside stability and therefore oil in water separation

### CHEMICAL USE AND DISCHARGE

The majority of chemicals used on Kittiwake during the period were in the least harmful Gold, Silver and E category chemicals. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

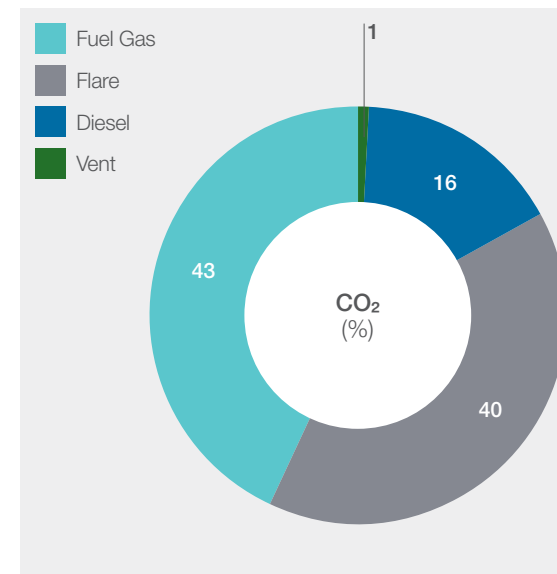


### DISCHARGES TO ATMOSPHERE

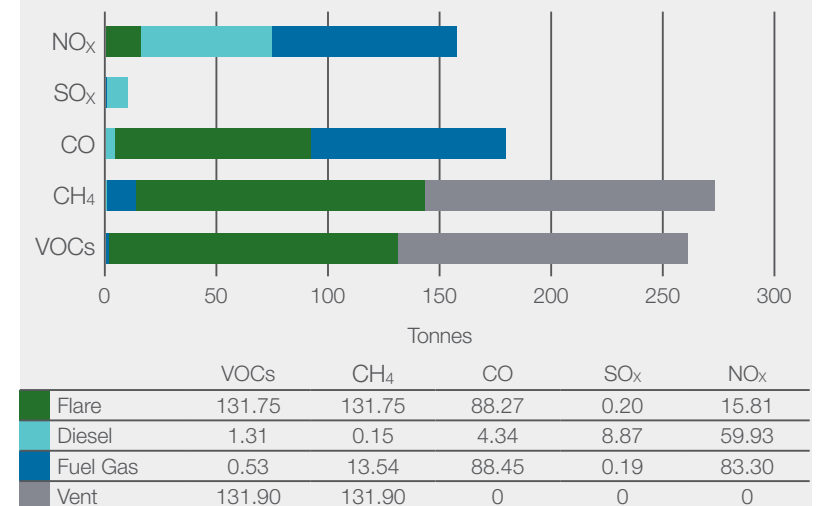
Power generation is the main source of atmospheric emissions from Kittiwake. Other sources include flaring and cold venting of hydrocarbon gas. From these sources, 89,917 tonnes of CO<sub>2</sub> was emitted from Kittiwake during 2019, equating to a 7% increase on 2018 levels. This can be attributed to an increase in flared gas due to the following:

- Periodic Q3 / Q4 2019 SEGAL gas pipeline restrictions prevented gas export onshore, resulting in periods of increased flaring

- The restart of the Crathes and Scolty wells resulted in a significant increase in received gas on Kittiwake. Due to differences in the Crathes and Scolty gas properties, primarily a lighter gas molecular weight compared to the other Kittiwake wells, a loss of compression efficiency has been experienced resulting in an increase in flared gas
- Due to mechanical issues, the Kittiwake gas compression system was offline for the majority of December. As a result, the normal gas export route was unavailable resulting in an increase in flaring



#### EMISSIONS BY SOURCE



There were four hydrofluorocarbons (HFCs) refrigerant gases and one hydrogen (HC) refrigerant gas in use on Kittiwake during the period. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	3.09	0.75	1,430	1.07
HFC-404a	6.25	2.75	3,922	10.79
HFC-407c	45.00	0.00	1,774	0.00
HFC-417a	34.00	24.00	2,346	56.30
<b>Total</b>	<b>88.34</b>	<b>27.50</b>	<b>-</b>	<b>68.16</b>
HC 600a	0.99	0.00	3.00	0.00

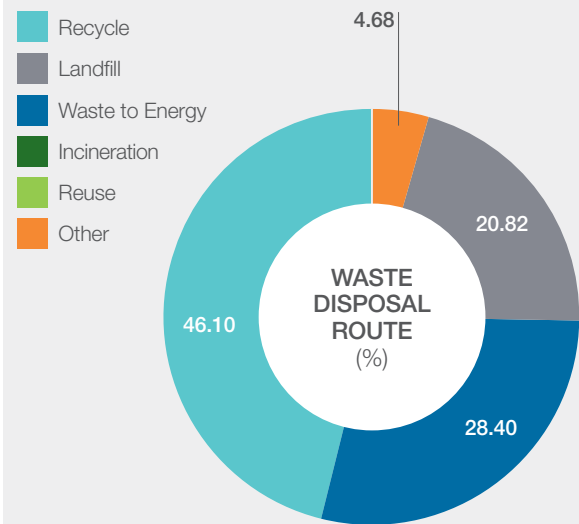


# ENVIRONMENTAL PERFORMANCE

## KITTIWAKE

### WASTE MANAGEMENT

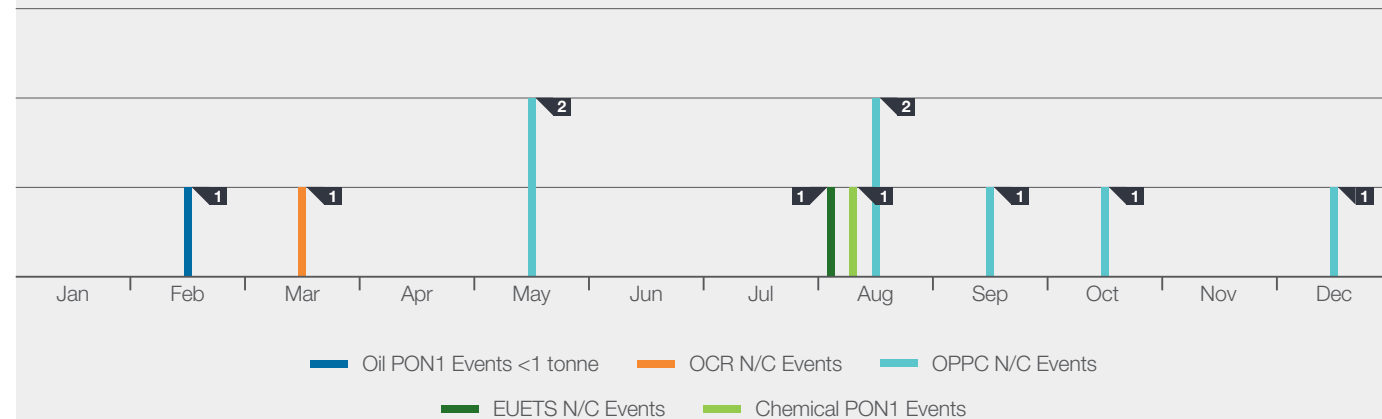
175 tonnes of waste generated on the platform was managed onshore from. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During 2019, two PON 1 notifications, seven OPPC non-compliance notifications, one OCR non-compliance notification and one PON10 notification was submitted to OPRED and other interested stakeholders.

#### REPORTABLE EVENTS 2019



During 2019, two PON 1 notifications, seven OPPC non-compliance notifications, one OCR non-compliance notification and one PON10 notification was submitted to OPRED and other interested stakeholders.

#### PON 1 PERMITTED DISCHARGE NOTIFICATIONS (PDNs)

Activity	Oil/Chemical type	Discharge (t)
Communication between the oil side and water side of Cooler E97001 resulting in a loss of crude oil to sea [PON1/8734]	Dispersed oil in produced water	0.92
Pinhole leak on the Scolty/Crathes hydraulic control system supply line	Aqualink control fluid	0.02

#### OPPC NON-COMPLIANCE NOTIFICATIONS

Permit	Non-Compliance	No.
OPPC Permit	Inoperable hazardous drain recovery pump	OPPCNCF/190204
OPPC Permit	Oil in water spot sample in excess of 100mg/l due to Grouse and Goosander bean up activity	OPPCNCF/190224
OPPC Permit	Oil in water spot sample in excess of 100mg/l due to Grouse and Goosander bean up activity	OPPCNCF/190363
OPPC Permit	Monthly oil in water exceedance following shutdown restart and subsequent topsides instabilities during well bean-up	OPPCNCF/190387
OPPC Permit	Monthly oil in water exceedance due to plant trips, FPS restrictions and the restart of the Grouse & Goosander wells following a short period of shut in	OPPCNCF/190451
OPPC Permit	Monthly oil in water exceedance due to plant trips, an FPS outage and the restart of the Scolty well following a lengthy period of shut in	OPPCNCF/190509
OPPC Permit	Monthly oil in water exceedance due to compression system failure resulting in a reduction in water volumes, wells being shut in and reduced Scolty and Crathes production	OPPCNCF/200001

#### OCR NON-COMPLIANCE NOTIFICATIONS

Permit	Non-Compliance	No.
OCR Permit	Tri ethylene glycol (TEG) routed to drain in an attempt to return the process back to normal following a trip event	OCRNCF/190029

#### PON10 NOTIFICATIONS

Permit	Non-Compliance	No.
Kittiwake Consent to Locate	In order to fix a faulty foghorn sounder the unit was taken offline for a period of time to implement a fix	PON10/190027



## ENVIRONMENTAL PERFORMANCE

# SCHOONER AND KETCH

Schooner and Ketch are normally unmanned gas platforms in the Southern North Sea. They entered cessation of production in August 2018. The export pipelines have been flushed and filled with sea water and are currently undergoing preparation ahead of plugging and abandonment of wells.

In November 2019, the ENSCO 100 rig commenced plug and abandonment operations at the Ketch platform. DNO is the Well Operator for the Schooner and Ketch platforms, so it reports all environmental data associated with well operations.

The environmental permits held by Petrofac for Schooner and Ketch are for chemical use and venting.

### DISCHARGES TO SEA

During the reporting period, there were no planned discharges to sea on the Schooner or Ketch platforms.

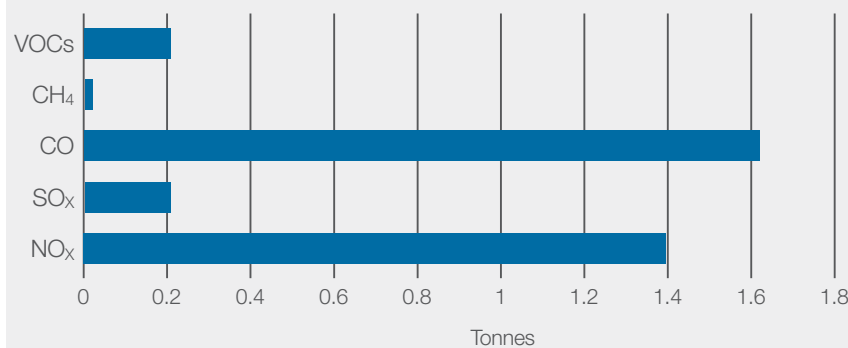
#### CHEMICAL USE AND DISCHARGE

The only chemical in use on the Schooner and Ketch platforms in 2019 was 561.5kg of MEG., which is in the lowest impact E category. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment. There was no chemical discharge to the environment during the reporting period.

### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources include venting gas. 354 tonnes of CO<sub>2</sub> emissions were estimated to have been emitted from the Schooner and Ketch platforms during the reporting period.

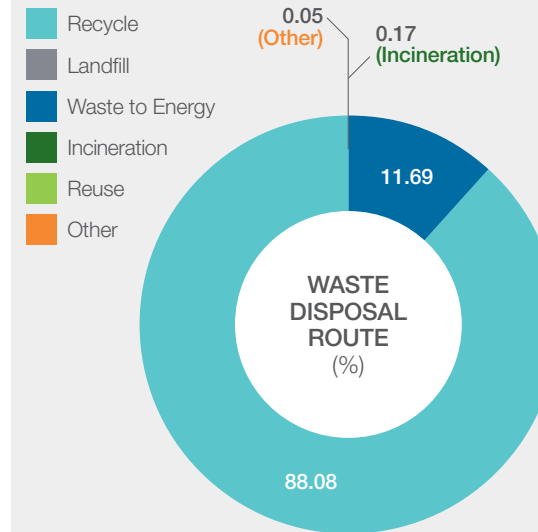
#### EMISSIONS BY SOURCE



	NO <sub>x</sub>	SO <sub>x</sub>	CO	CH <sub>4</sub>	VOCs
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	1.394	0.206	1.621	0.019	0.207
Flare	0	0	0	0	0

### WASTE MANAGEMENT

32.896 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During the reporting period, there were no planned discharges to sea on the Schooner or Ketch platforms.



# ENVIRONMENTAL PERFORMANCE

## BORGLAND DOLPHIN

The Borgland Dolphin semi-submersible drilling rig completed a three well drilling campaign in the Liberator and Serenity fields in the Outer Moray Firth / Central North Sea between August and November 2019.

### DISCHARGES TO SEA

#### DRILL CUTTINGS AND FLUIDS DISCHARGE

A total of 210.09 tonnes of water-based drill cuttings were discharged to sea during drilling activities. The total oil discharged associated with the cuttings was 0.00003 tonnes.

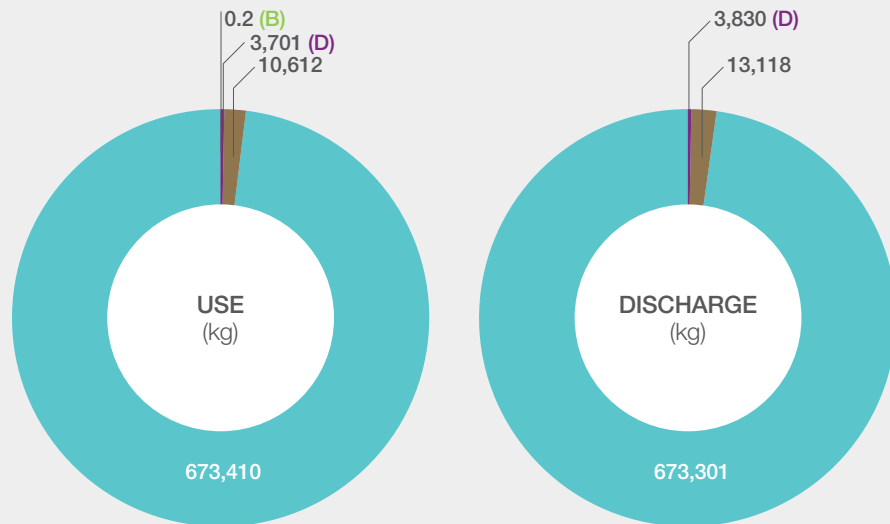
#### DRILLING CUTTINGS DISCHARGE

Total quantity of cuttings discharged (t)	210.09
Total quantity of oil discharged (t)	0.00003
Average oil discharged from oil bearing reservoir cuttings (%)	0.00

#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use during the Liberator and Serenity campaign were in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

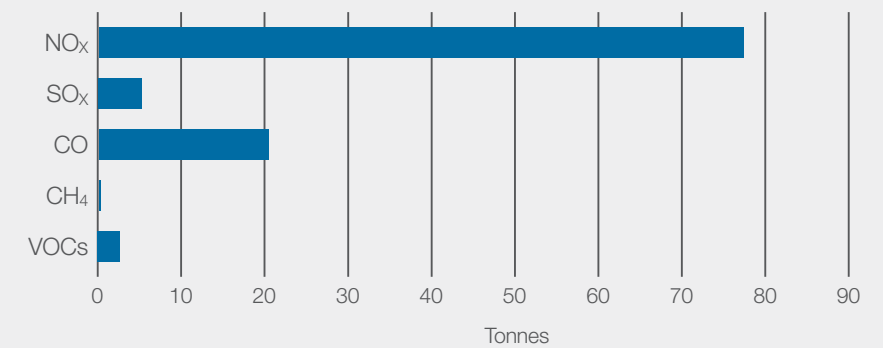
- Gold
- E
- B
- D



### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines. The main combustion product is Carbon Dioxide (CO<sub>2</sub>) and a total of 4,169 tonnes of CO<sub>2</sub> was emitted. Other combustion emissions reported through the Environmental Emissions Monitoring System (EEMS) are described on the right:

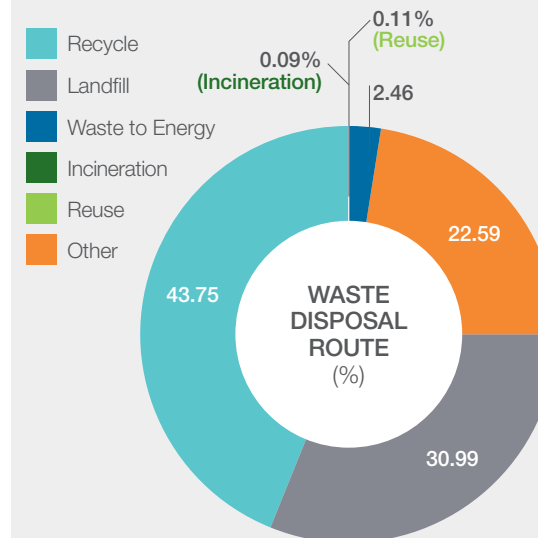
#### EMISSIONS BY SOURCE



	VOCs	CH <sub>4</sub>	CO	SO <sub>x</sub>	NO <sub>x</sub>
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	2.72	0.23	20.46	5.21	77.39
Flare	0	0	0	0	0

### WASTE MANAGEMENT

A total of 108.076 tonnes of waste was brought onshore for disposal from the Borgland Dolphin during its activities. A large proportion of this included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During its activities for Petrofac, five PON 1 Notifications were submitted for the Borgland Dolphin drilling rig. The total discharge was less than one tonne of fluid – the details of which are indicated below:

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Bulk loading	Cement	0.05
Bulk transfer	Barite	0.1
Diverter housing overflow	WBM	0.2
Accumulator dump valve	Hydraulic fluid	0.134
Burst hose (ROV)	Hydraulic oil	0.028

The permit non compliances submitted during the drilling activities are indicated below:

Permit	Non-Compliance	Description
Vertical Seismic Profile	Marine Survey Permit	Soft start not carried out as described
PON 10	Consent to locate	Aft Starboard fog horn operating at reduced volume



# ENVIRONMENTAL PERFORMANCE

## ENSCO 72

The EnSCO 72 jack-up drilling rig completed a three well plug and abandonment (P&A) campaign in the Southern North Sea between May and July 2019.

### DISCHARGES TO SEA

#### WELL INTERVENTION FLUIDS DISCHARGE

A total of 309.87 cubic metres of Well Intervention Fluids were discharged to sea during P&A activities. The total weight of dispersed oil discharged associated with the Well Intervention Fluid was 0.0029 tonnes, with an average concentration of oil in the fluids of 13.03 mg/l.

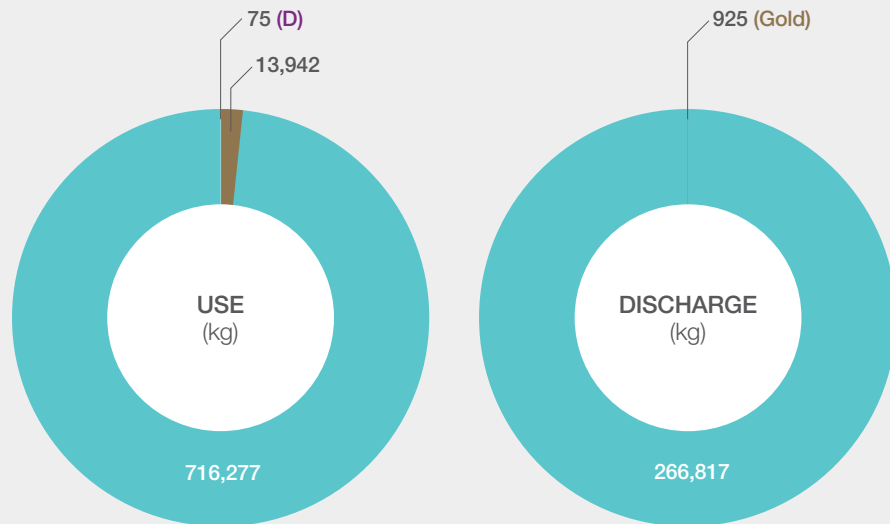
#### INTERVENTION FLUIDS DISCHARGE

Total volume of Well Intervention fluids discharged (m <sup>3</sup> )	309.870
Total weight of dispersed oil in fluids discharged (t)	0.003
Average concentration of oil in Well Intervention fluids (mg/l)	13.030

#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the EnSCO 72 are in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

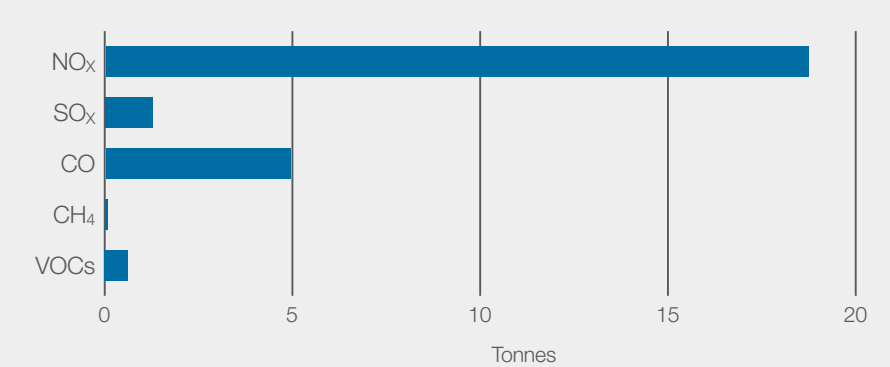
- Gold
- E
- B
- D



### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines and gas flaring operations. The main combustion product is Carbon Dioxide (CO<sub>2</sub>). A total of 1,010 tonnes of CO<sub>2</sub> were emitted from the sources described on the right:

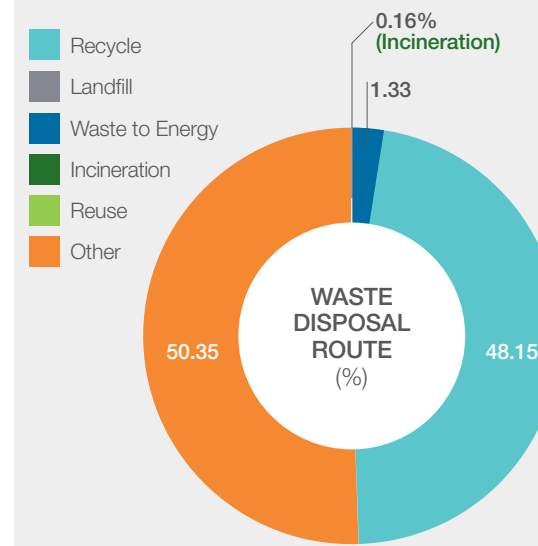
#### EMISSIONS BY SOURCE



	VOCs	CH <sub>4</sub>	CO	SO <sub>x</sub>	NO <sub>x</sub>
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	0.63	0.06	4.95	1.26	18.74
Flare	0	0	0	0	0

### WASTE MANAGEMENT

A total of 370.92 tonnes of waste was brought onshore for disposal from the Transocean Spitsbergen during its activities. A large proportion of this waste was tank washings (186.77 tonnes) which included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During its activities for Petrofac there were no unplanned releases to sea. The permit non-compliances submitted during the drilling campaign are indicated below:

Permit	Non-Compliance	Description
OPPC	EEMS Return	Thurn well EEMS submission made after deadline due to late receipt of analysis
OPPC	EEMS Return	Cameron well EEMS submission submission made after deadline due to late receipt of analysis



## ENVIRONMENTAL PERFORMANCE

# OCEAN GREATWHITE

The Ocean GreatWhite semi-submersible rig completed a three well campaign at the Blackrock, Lyon and Cambo fields West of Shetland between March and July 2019.

### DISCHARGES TO SEA

#### DRILL CUTTINGS AND FLUIDS DISCHARGE

A total of 8.14 tonnes of water-based drill cuttings were discharged to sea during drilling activities. The total oil discharged associated with cuttings was 0.05 tonnes.

A total of 477 tonnes of well clean up fluids were discharged to sea during drilling activities. The total oil discharged associated with cuttings was 0.475 tonnes.

#### DRILLING CUTTINGS DISCHARGE

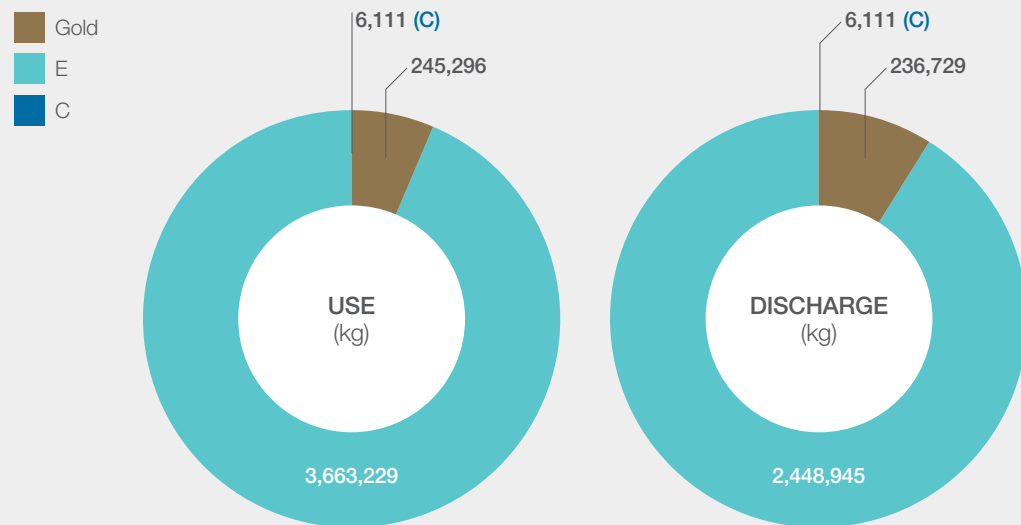
Total quantity of cuttings discharged (t)	8.14
Total quantity of oil discharged (t)	0.05
Average oil discharged from oil bearing reservoir cuttings (%)	0.845

#### WELL CLEAN UP FLUIDS DISCHARGE

Total volume of well clean up fluids discharged (m <sup>3</sup> )	477
Total weight of dispersed oil in fluids discharged (t)	0.475
Average concentration of oil in well clean up fluids (mg/l)	995.81

#### CHEMICAL USE AND DISCHARGE

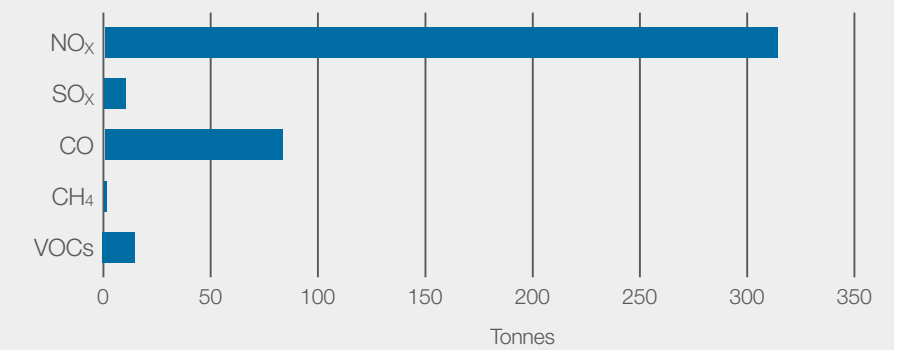
The majority of chemicals in use on the Ocean GreatWhite are in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.



### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines. The main combustion product is Carbon Dioxide (CO<sub>2</sub>) and during the reporting period, a total of 16,928 tonnes of CO<sub>2</sub> was emitted. Other combustion emissions reported through the Environmental Emissions Monitoring System (EEMS) are described on the right:

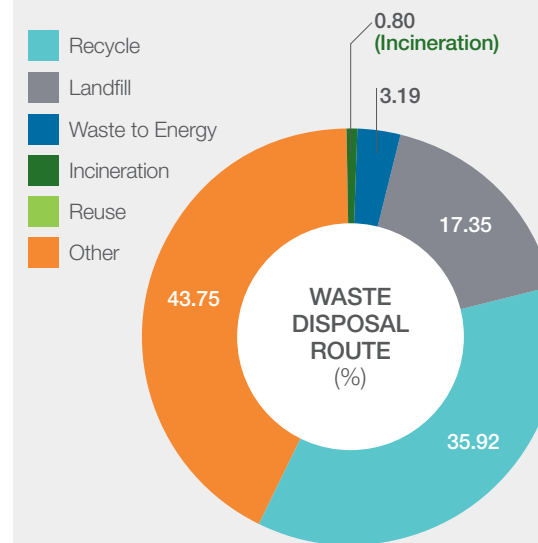
#### EMISSIONS BY SOURCE



	VOCs	CH <sub>4</sub>	CO	SO <sub>x</sub>	NO <sub>x</sub>
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	10.58	0.95	83.06	9.9	314.22
Flare	0	0	0	0	0

### WASTE MANAGEMENT

A total of 316.557 tonnes of waste was brought onshore for disposal from the Ocean GreatWhite during its activities. A large proportion of this included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During its activities for Petrofac, one PON 1 notification was submitted for the Ocean GreatWhite drilling rig. The total discharge was less than one tonne of fluid – the details of which are indicated below:

#### PON 1 Notification details

Activity	Oil/Chemical type	Quantity (t)
Bulk Transfer	Flowcarb	0.264

The permit non compliances submitted during the drilling activities are indicated below:

Permit	Notification Type	Description
Consent to Locate	PON10	Rig doesn't comply with standard marking schedule – no secondary lights / fog signal
Well clean up fluid discharge	OPPC	Inconclusive sample results for well clean up fluid discharge. Results distorted by glycol in WBM
Cuttings samples	OPPC	Only four samples returned onshore

PON 2 notifications were submitted for the following objects lost to sea:

Activity	Notification Type	Description
Cut and Recovery of PON 2 Wellhead		Slip insert lost to sea
Pulling Casing	PON 2	20" casing piece lost to sea
Deploying BOP	PON 2	Polypropylene resin grating panels lost to sea
ROV Operations	PON 2	Cable between the Tether Management System and the I-Tech ROV parted causing the ROV to be lost. The ROV was recovered
Running Casing	PON 2	Casing 'Stop' collar lost to sea
Bulk Transfer	PON 2	Rig wifi handheld phone lost to sea



# ENVIRONMENTAL PERFORMANCE

## STENA SPEY

The Stena Spey completed a one well drilling campaign in the Anasuria field in the Central North Sea between May and August 2019.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

Water discharges are monitored and reported in accordance with the Oil Pollution Prevention Permit and Conditions. The average oil in water discharge was 11.05 mg/l during well test operations.

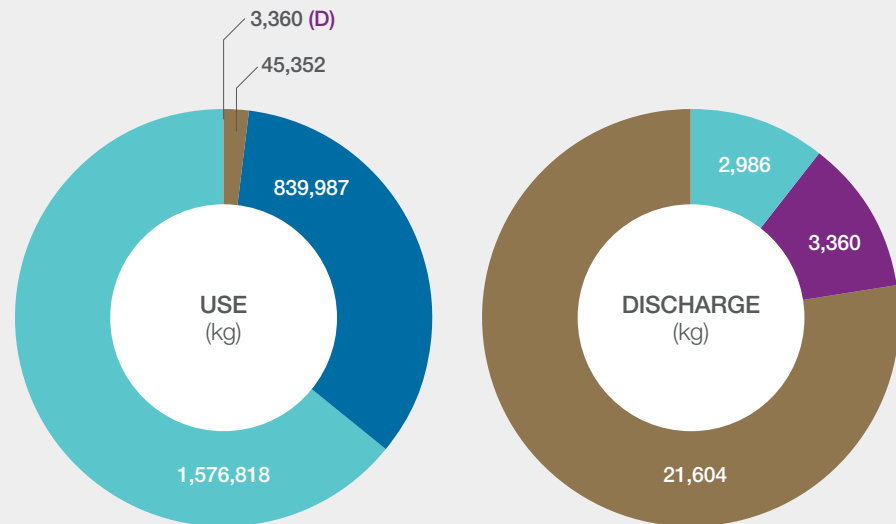
#### PRODUCED WATER DISCHARGES

Total volume of produced water discharged (m <sup>3</sup> )	73,299
Weight of dispersed oil discharged (t)	0.001
Average dispersed oil concentration (mg/l)	11.050

#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Stena Spey are in the least harmful Gold and E categories. A large quantity of the chemicals used are in the C category, however none of these were discharged. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

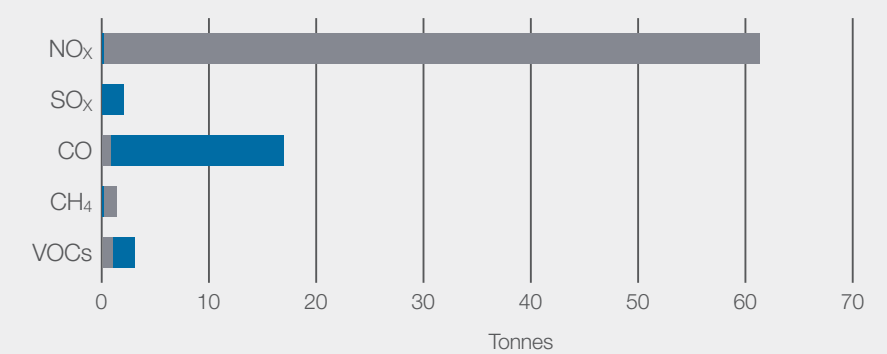
- Gold
- E
- D
- C



### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines and flaring during well test operations. The main combustion product is Carbon Dioxide (CO<sub>2</sub>), with a total of 3,434 tonnes emitted. Other combustion emissions reported through the Environmental Emissions Monitoring System (EEMS) are described on the right:

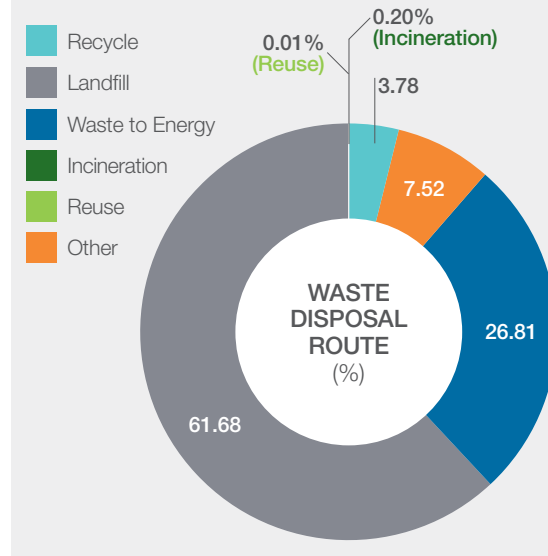
#### EMISSIONS BY SOURCE



	VOCs	CH <sub>4</sub>	CO	SO <sub>x</sub>	NO <sub>x</sub>
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	2.06	0.19	16.16	2.06	61.14
Flare	1.06	1.15	0.77	0	0.16

### WASTE MANAGEMENT

A total of 206,234 tonnes of waste was brought onshore for disposal from the Stena Spey during its activities. A large proportion of this waste was oil based drill cuttings, some of which went to landfill.



### REPORTS AND NOTIFICATION

During its activities for Petrofac, there were no PON 1s, PON 2s or regulatory non-compliances submitted for the Stena Spey.



## ENVIRONMENTAL PERFORMANCE

# TRANSOCEAN LEADER

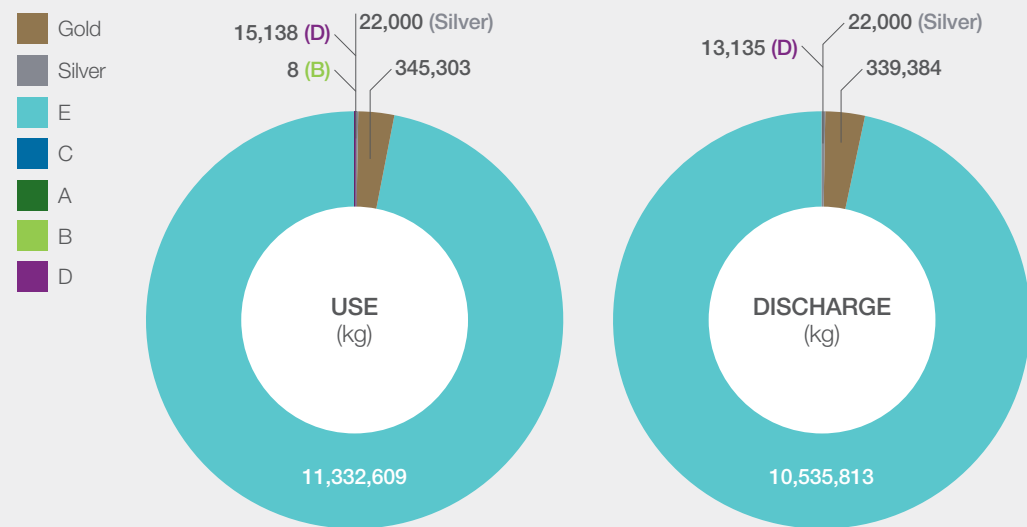
The Transocean Leader completed a three well campaign in the Warwick and Lincoln fields West of Shetland between April and December 2019.

### DISCHARGES TO SEA

DRILL CUTTINGS AND FLUIDS DISCHARGE	DRILLING CUTTINGS DISCHARGE	
Discharges of oil to sea from the Transocean Leader operations West of Shetland were associated with drill cuttings, drill fluids and produced water from well test activities.	Total quantity of cuttings discharged (t)	248.6
	Total quantity of oil discharged (t)	0.0688
	Average oil discharged from oil bearing reservoir cuttings(%)	0.03
	DRILLING FLUIDS DISCHARGE	
	Total quantity of fluids discharged (t)	4881.35
	Total quantity of oil discharged (t)	0.14657
	Average oil discharged from oil bearing reservoir fluids (%)	<0.01
	PRODUCED WATER DISCHARGE	
	Produced water discharged (m <sup>3</sup> )	847.947
	Average OIW concentration (Mg/l)	0.0054
	Total oil discharged (t)	6.37

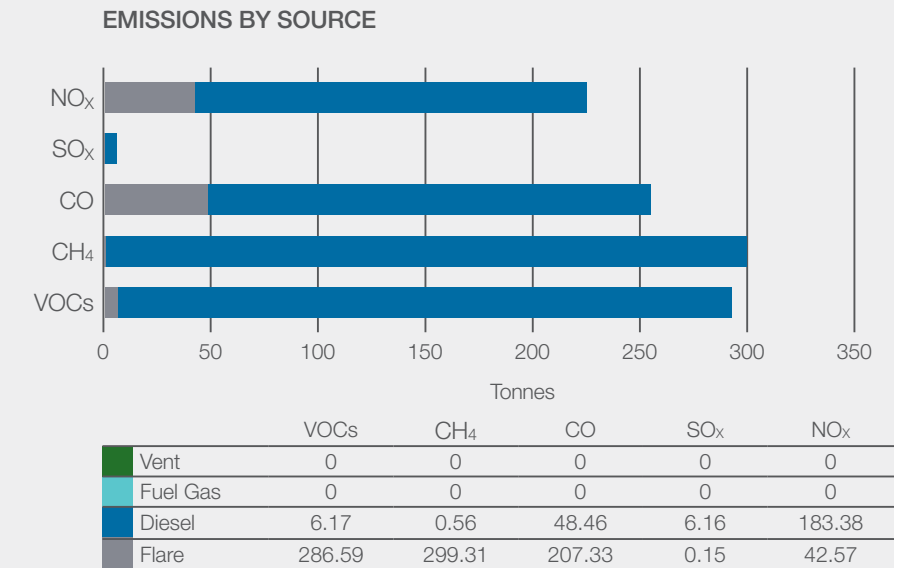
### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Ocean GreatWhite are in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.



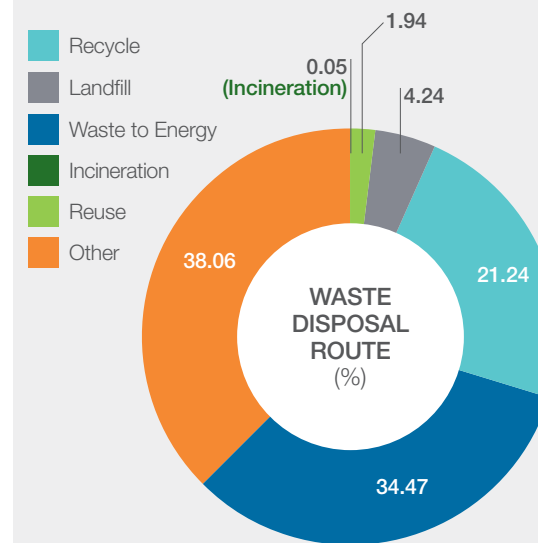
### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines and flaring from well test activities. The main combustion product is Carbon Dioxide (CO<sub>2</sub>), with a total of 47,248 tonnes emitted. Other combustion emissions reported through the Environmental Emissions Monitoring System (EEMS) are described on the right:



### WASTE MANAGEMENT

A total of 316.557 tonnes of waste was brought onshore for disposal from the Ocean GreatWhite during its activities. A large proportion of this included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During its activities for Petrofac, two PON 1 Notifications were submitted for the Transocean Leader drilling rig. The total discharge was less than one tonne of fluid – the details of which are indicated below:

#### PON 1 Notification details

Activity	Oil/Chemical type	Quantity (t)
Loss of BOP control fluid	MEG / STACK-MAGIC ECO-FV2	0.189
Leaking hose on BOP control system	MEG / STACK-MAGIC ECO-FV2	0.082

One permit non-compliance was submitted during the drilling campaign and is indicated below:

Permit	Notification Type	Description
Consent to Locate	PON 10	Secondary lighting system did not automatically activate





## **CONTACT**

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