



Voyageur Spirit FPSO

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ABBREVIATIONS

BBLs	Barrels
BEIS	Department for Business Energy and Industrial Strategy
BOPD	Barrels of Oil Per Day
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CH ₄	Methane
CNS	Central North Sea
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
EEMS	Environmental and Emissions Monitoring System
EMS	Environmental Monitoring System
EU ETS	European Union Emissions Trading System
FPSO	Floating, Production, Storage and Offloading
HSSE	Health, Safety, Security, Environment and Quality
ISO	International Organization for Standardization
NORM	Naturally Occurring Radioactive Material
NO _x	Nitrogen Oxides
N ₂ O	Nitrous Oxide
OIW	Oil in Water
OPPC	Oil Pollution Prevention and Control
OPEP	Oil Pollution Emergency Plan
PLANC	Permits, Licences, Authorisation and Consent
PON1	Petroleum Operation Notice 1
SO _x	Sulphur Oxides
UKCS	United Kingdom Continental Shelf
VOC	Volatile Organic Compound

1 INTRODUCTION

The Voyageur Spirit, Floating, Production, Storage and Offloading vessel (FPSO) is the host installation of the Huntington Field. The FPSO lies in approximately 89 m of water and is located in UKCS Block 22/14 of the Central North Sea (CNS), approximately 204 km from the Scottish coast and 27 km from the UK/Norwegian median line. The FPSO is owned and operated by Teekay Voyageur Production Limited, which is part of the Teekay Corporation, hereafter referred to as Teekay.

The Voyageur FPSO has an oil production capacity of 30,000 Barrels of Oil Per Day (BOPD) and a storage capacity of 270,000 barrels (BBLs).

Under the Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015, Teekay became the FPSO installation operator in place of Premier Oil, effective on the 1st of December 2017. Therefore, this Annual Environmental Statement only outlines the environmental performance of the Voyageur Spirit FPSO for December 2017. A separate Annual Environmental Statement for the period of January to November 2017 will be provided by Premier Oil.

2 ENVIRONMENTAL MANAGEMENT SYSTEM

2.1 HSSE Policy

Teekay's commitment to the environment, as well as health, safety and security, are detailed within Teekay's policy statement, shown in Figure 2.1. Teekay's Health, Safety, Security and Environmental (HSSE) policy is a public commitment to conducting business in a manner that protects the health and safety of people and preserves the integrity of the environment.

The main goals of the policy are:

- No injury to personnel;
- No harm to the environment;
- No damage to equipment; and
- No security breaches.

2.2 EMS

To achieve its commitments to the highest levels of HSSE, Teekay uses its Environmental Management System (EMS) for the continuous improvement of its environmental performance. The EMS is used to identify, assess and mitigate environmental risks and manage environmental performance of all its operations.

The EMS is an integral element of the HSSE Management System and is based on the principle, "plan, do, check and act". The EMS is designed to achieve the environmental goals of the prevention and elimination of pollution from offshore sources, the protection and conservation of the maritime area against other adverse effects of offshore activities and the continual improvement in environmental performance. Teekay produces an annual Sustainability Report which includes the status of its environmental performance.

The EMS is verified against the International Organization for Standardization (ISO) 14001 Standard for EMS including their North Sea Assets. Teekay ensures maintenance and compliance with ISO 14001. Environmental compliance is also managed through the development of an asset specific Permits, Licences, Authorisation and Consent (PLANC) Register and an Environmental Compliance Plan.



Health, Safety, Security and Environmental Policy

High quality HSSE performance is essential and valuable for the success of our business and employees. To achieve this, we have anchored HSSE as a line responsibility and we are committed to comply with all regulatory requirements and continuously improve performance. Our main goals are:

- No injury to personnel
- No harm to the environment
- No damage to equipment
- No security breaches

To achieve this, Teekay Offshore Production will:

- Ensure HSSE is everyone's responsibility
- Empower all employees to speak up and stop work if something is not safe
- Use our operational experience to maintain and continuously improve HSE performance
- Focus on major accident hazards and process safety to reduce risk
- Focus on hydrocarbon release prevention and reduction
- Minimize discharges, emissions and waste and their environmental effects
- Exercise sustainable corporate social responsibility wherever we operate
- Assess the security risk for our offices, FPSO's and ships, and implement prudent preventive actions
- Expect all contractors and subcontractors meet our HSSE expectations
- Proactively monitor, evaluate and report HSSE performance associated with our HSSE targets

Your work is never so urgent that you don't have time to do it safely.

Trondheim, November 24th 2016

Chris Brett
President

Rev. 2016-11-24

Figure 2.1 Teekay's HSSE Policy

3 ENVIRONMENTAL PERFORMANCE

Teekay has identified the following significant environmental aspects of its operations:

- Atmospheric emissions;
- Oil discharged in produced water;
- Chemical use and discharge;
- Solid waste generation and disposal; and
- Oil and chemical spills.

Teekay routinely monitors and reports its performance in terms of environmental emissions and discharges as required by UK legislation and the internal HSSE Management System. This information is reported via the Environmental and Emissions Monitoring System (EEMS), which is a database of environmental information that is accessible by oil and gas operators and by the regulator, the Department for Business, Energy and Industrial Strategy (BEIS).

3.1 Atmospheric Emissions

Atmospheric emissions generated by combustion activities are regulated by the European Union Emission Trading Scheme (EU ETS) 2005 and the Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2013. The main combustion processes on the Voyageur FPSO are dual fuel turbines for power generation, operating primarily on fuel gas with operation on only diesel in abnormal operating modes.

The flaring of gas on the Voyageur FPSO is restricted and only applicable for safety reasons. Teekay continually looks to identify opportunities to reduce emissions from its operations, such as improving the efficiency of the process and utility system to reduce the fuel burnt.

During 2017, the FPSO combustion activities (fuel gas and diesel combustion for power generation purposes and process gas flaring for safety purposes) generated carbon dioxide (CO₂), nitrogen oxide (NO_x), sulphur oxide (SO_x), carbon monoxide (CO), methane (CH₄) and non-methane Volatile Organic Compounds (VOC) emissions.

Figure 3.1 shows the actual and permitted non-CO₂ emissions resulting from combustion activities on the Voyageur FPSO for December 2017 (Teekay's operational period). In December 2017, there was 295.49 tonnes of non-CO₂ emission, which is well below the permitted amount for non-CO₂ emissions.

There is no permitted amount of CO₂ emissions. In December 2017, 37,971.41 tonnes of CO₂ was emitted.

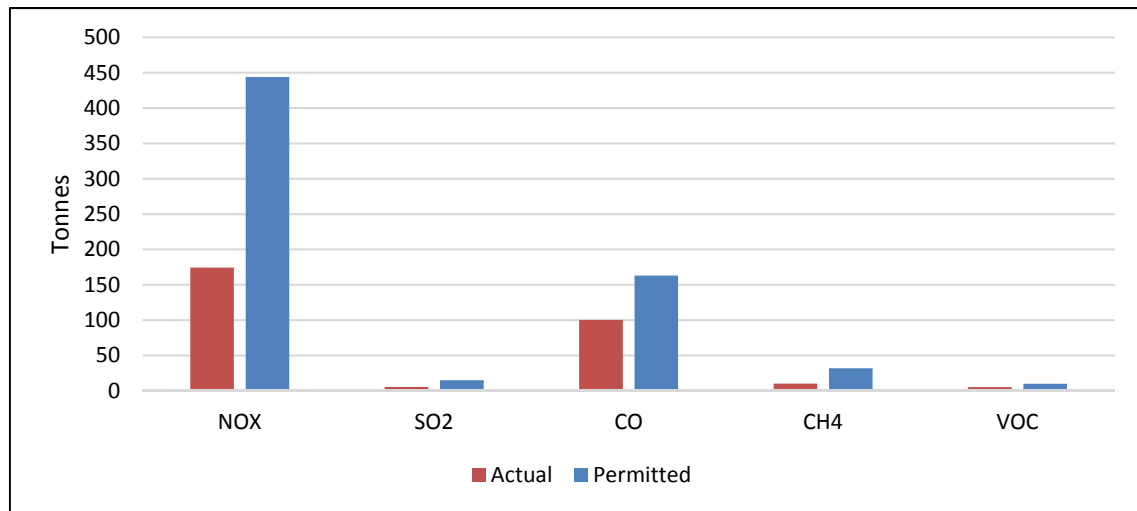


Figure 3.1 Non-CO₂ emissions during December 2017

Figure 3.2 illustrates the percentage of permitted non-CO₂ emissions which was emitted in the whole of 2017. All emissions were within the permitted thresholds. On average, less than 50 % of the permitted non-CO₂ emissions were emitted.

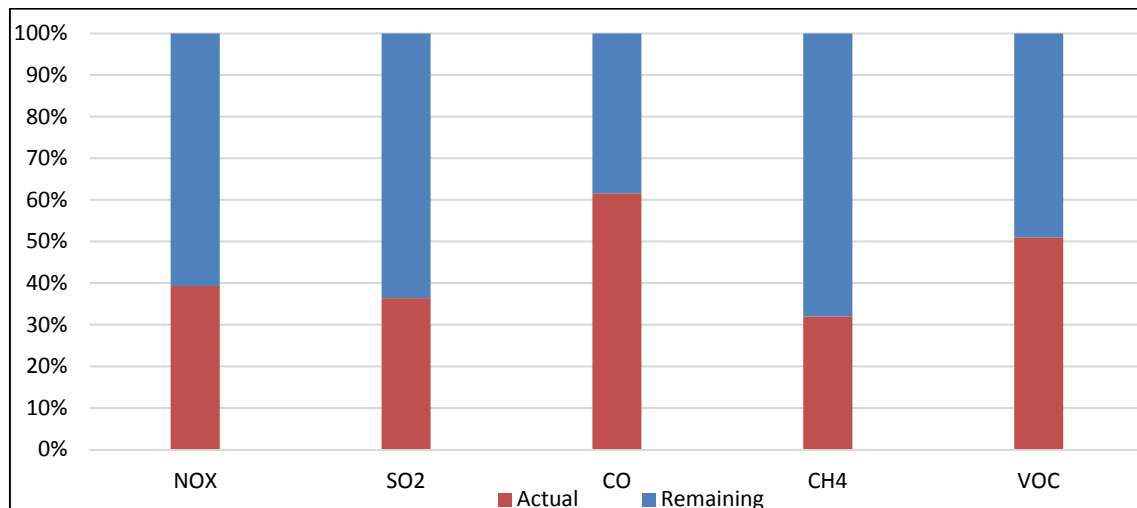


Figure 3.2 Permitted thresholds vs actual non-CO₂ emissions for 2017

3.2 Oil Discharged in Produced Water

Oil and gas reservoirs have a natural water layer (called formation water) that, being denser, lies under the hydrocarbons. As reservoirs become depleted of oil and gas, seawater is usually injected into the reservoirs to support hydrocarbon recovery. Both formation and injected waters are eventually produced along with the hydrocarbons and, as an oil field matures, the volume of produced water tends to increase as the reservoir fills with injected seawater. The 'water cut' or amount of water in produced fluids from wells on mature assets can be >95 % by weight compared with the oil content.

On the Voyageur FPSO, produced water is separated from hydrocarbons in gravity separators and treated to remove as much oil as possible before it is discharged to sea. Due to produced Oil in Water (OIW), the discharge to sea of produced water is strictly controlled by the Offshore Petroleum Activities (Oil Pollution Prevention and Control) (OPPC) Regulations 2005, which define the average oil content of the water that may be discharged.

The OIW discharges for 2017 is illustrated in Figure 3.3. The total oil discharged in produced water from the FPSO was 0.62 tonnes. The annual oil discharge allowance was 0.849 tonnes. During the period for which Teekay was installation operator of the FPSO, December 2017, 0.114 tonnes of OIW (18.39 % of the annual allowance) was discharged. The produced water quality in for each month in 2017 was well within the regulatory limit of 30 mg/l.

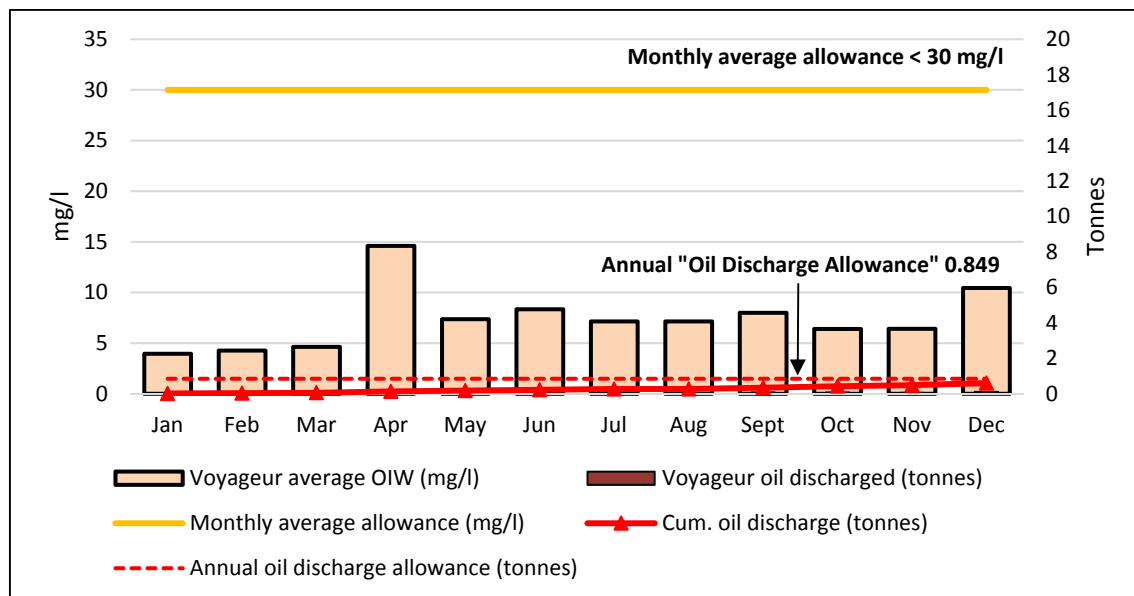


Figure 3.3 Voyageur oil in produced water discharges in 2017

3.3 Produced sand

Sand in oil/water occurs due to the migration of sand induced by the flow of oil. After the OIW separation processes, produced sand may accumulate in some of the produced water systems. There was no produced sand discharged from the operation of the Voyageur FPSO by Teekay in December 2017.

3.4 Chemical Use and Discharge into the Marine Environment

All chemicals used offshore during oil and gas production must be approved by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), and their use and discharge is controlled under the Offshore Chemicals Regulations 2002. All chemicals used must be risk assessed by the operator as part of the permitting process, and the use of any chemical which has hazardous properties (such as low biodegradability or high toxicity) requires additional justification. Teekay selects chemicals for use offshore with the environmental impact in mind and attention will be given to substitution and other warnings, with an aim to avoid the use of such chemicals where possible, or seek an alternative where practicable.

Production chemicals include:

- Corrosion inhibitors;
- Scale inhibitors;
- Hydrogen sulphide inhibitors;
- Biocides to prevent microbial souring of reservoirs; and
- Deoilers and demulsifiers to help separate oil from produced water.

Teekay is committed to compliance with Offshore Chemical Regulations 2002 (as amended) as a minimum. Teekay utilises a Chemical Management Strategy, taking a pro-active approach in the management of chemical issues, relating to chemical usage and discharge and creating annual plans to minimise the use and discharge of chemicals.

Figure 3.4 illustrates the percentage of the actual chemical usage compared with the permitted chemical usage in the whole of 2017, rather than just for December 2017, in order to illustrate the annual trend. As shown in Figure 3.4 and Figure 3.5, the chemical usage and discharge for 2017 have similar profiles. The actual usage and discharge of chemicals on the Voyageur FPSO in 2017 was 119,754 kg.

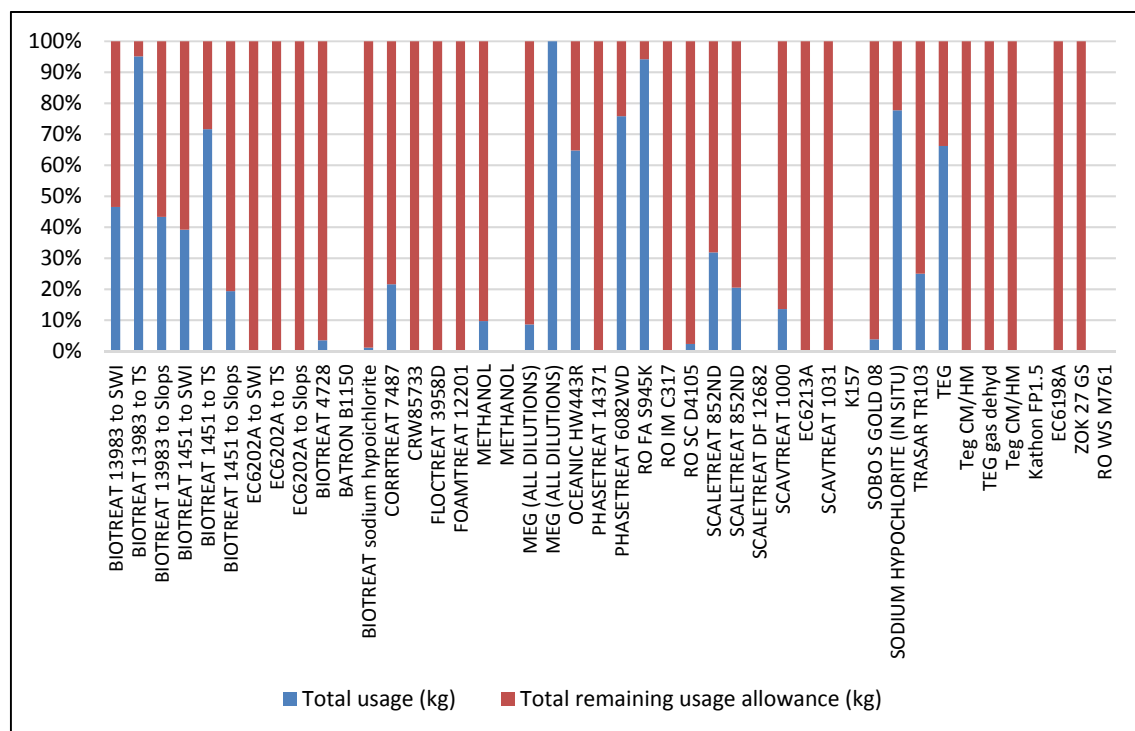


Figure 3.4 Chemical usage vs permitted usage 2017

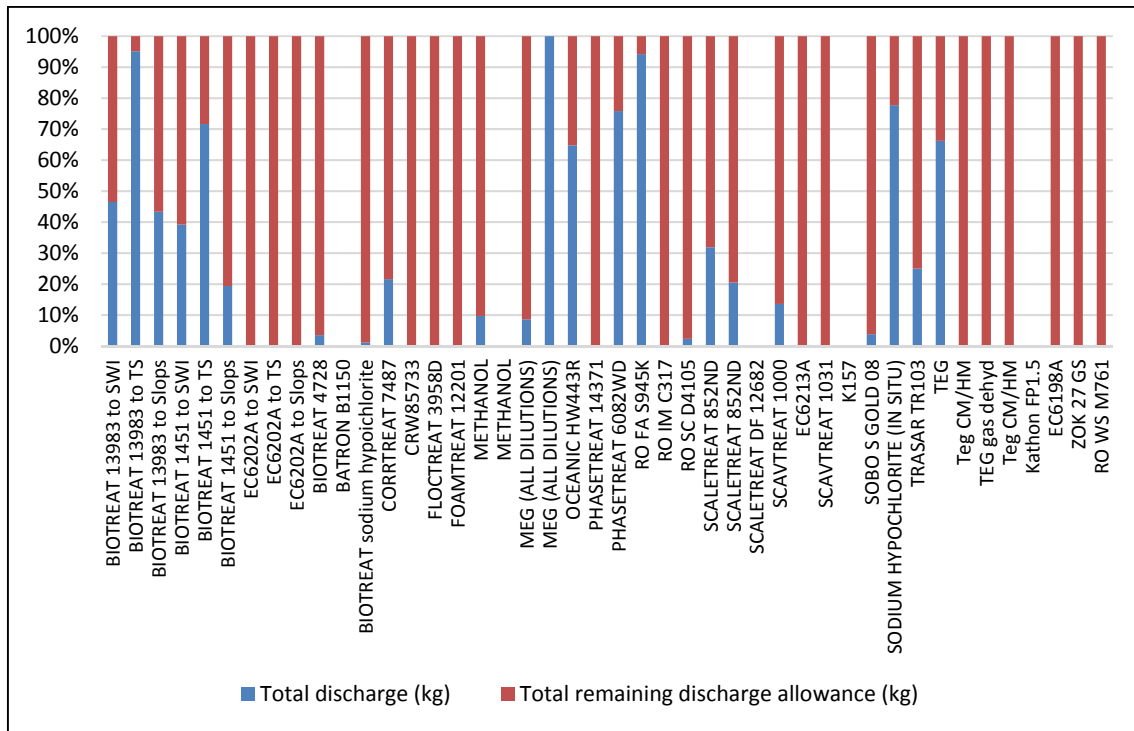


Figure 3.5 Chemical discharge vs permitted discharge in 2017

3.5 Solid Waste Generation and Disposal

Teekay must ensure that the segregation, transportation and eventual disposal of wastes generated during their offshore operations are managed in accordance with legislative requirements. The Environmental Protection Act 1990 introduced the 'Duty of Care' with which all waste producers must comply. Hazardous waste that might be harmful to human health or the environment (known as Special Waste in Scotland) is governed by specific legislation, which includes strict handling and disposal requirements. Teekay implements its Waste management procedure to manage all wastes and ensure adherence to respective legislation.

Teekay is working to reduce the amount of waste generated offshore, especially of hazardous wastes such as oil-contaminated rags and other similar items. Wherever possible wastes are recycled or reused.

Figure 3.6 shows waste disposal in December 2017, the period in which Teekay became the installation operator. Operations on the FPSO generated 5.19 tonnes of waste, 43.3 % of which was recycled, 12.9 % turned to energy and 43.8 % landfilled.

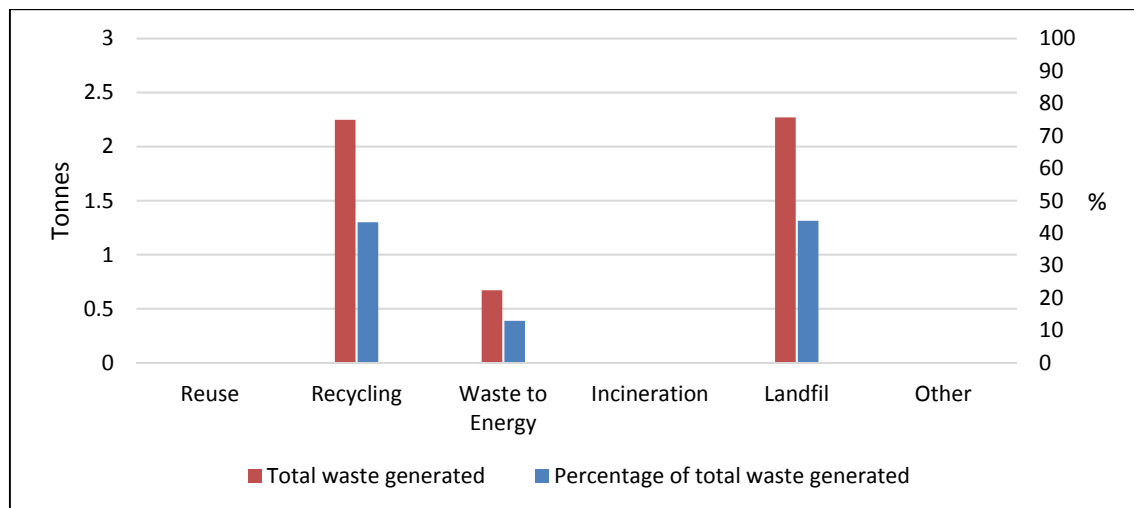


Figure 3.6 Waste disposal in December 2017

3.6 Accidental Releases and Permit Non-Compliances

All discharges to the sea other than those authorised by the OPPC permit, must be reported to the relevant authorities, regardless of volume. These reports are made on a PON1 (Petroleum Operations Notice 1) form, and include notification of accidental releases of oils and chemicals to the sea, and permitted discharge notifications which report higher amounts of oil discharged to sea under an OPPC permit (>1 tonne in any 12-hour period), or unusual sheens which have the potential to cause environmental impact or affect other users of the sea.

Teekay takes its responsibility to prevent accidental discharges of oil and chemicals to sea very seriously. Procedures are in place to prevent spills and to ensure that hydrocarbons remain securely within the process system on all FPSOs. Teekay has government approved Oil Pollution Emergency Plans (OPEPs) in place for all offshore installations.

Since the transition of Teekay as installation operator of the Voyageur FPSO in December 2017, there have been no instances of accidental releases and no PON1s have been issued.

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4 CONCLUSION

Teekay is committed to minimising impacts to the environment from offshore operations. Through the regular review of environmental performance, and the setting and delivery of environmental objectives that are appropriate to environmental risks, Teekay shall continue to improve environmental performance.

Teekay plan to deliver the following key environmental objectives in 2018:

- To improve the quality of housekeeping and process safety to reduce the risk of environmental incidents;
- To develop an information pack on Naturally Occurring Radioactive Material (NORM) awareness for core crew and NORM familiarisation for all crew members; and
- To ensure compliance with environmental regulations.