

Dana Petroleum UKCS Environmental Statement 2018



Table of Contents

Introduction	2
Dana Petroleum Values	3
Health, Safety, Security & Environment (HSSE) Policy	4
HSSE Management System	5
Overview of Operations	6
UK Production Operations.....	7
Triton FPSO.....	7
Western Isles FPSO.....	8
Hudson	9
Drilling Operations	9
Decommissioning Operations.....	9
Environmental Performance.....	10
Atmospheric Emissions.....	10
Oil in Water	11
Chemical use and discharge	11
Waste	12
Unplanned Releases.....	14
Environmental Performance against Objectives.....	15
Environmental Objectives for 2019.....	16

Introduction

This statement describes the 2018 environmental performance of Dana Petroleum (E&P) Limited for its UK offshore oil and gas operations. It has been prepared to satisfy the requirements of OSPAR Recommendation 2003/5 and the associated OPRED guidance (OSPAR 2003/5 DECC Guidance: Rev 5 May 2014).

Dana, a wholly owned subsidiary of the Korea National Oil Corporation, operates internationally with offices in the UK, Egypt and the Netherlands. In the North Sea, Dana operates three assets as well as being a partner in several non-operated ventures.

One of Dana's key values is to respect the environment and to work to minimise the impact of its operations. Dana achieves this through active use of its EMS system, development of its E-Reps network and proactive engagement with offshore and operational groups. Through these routes, Dana ensures work activities incorporate current and developing legislation and initiatives shared from government and industry work groups.

Dana works to minimise environmental impact wherever the company operates.



Dana Petroleum Values

We work hard to deliver the best results using our values to guide how we do business. We respect all of our operating environments wherever we are in the world.



Safety

High safety performance is expected in everything we do. It protects our people, our assets and the environment.

Performance

We aim to deliver value for our shareholder through safe, reliable and efficient operations.

Professional

We will set and maintain high professional and ethical standards in everything we do.

People

We will respect each other and our partners, contractors and other stakeholders who support our business.

HSSE Policy



Health, Safety, Security & Environment (HSSE) Policy

Our policy

The safety of our people and assets, and respect for the environment are two of our core values and are an integral part of how we do business. We believe strong Health, Safety, Security and Environmental (HSSE) performance creates strong commercial performance.

Accountability

The Chief Executive Officer (CEO) has overall accountability to the Dana Board of Directors for the management of HSSE.

Scope

Our policy applies to all employees (staff, contract and temporary), officers and directors of Dana Petroleum Limited (collectively referred to as 'employees') in each of our operating units worldwide and anywhere that we conduct business or visit in the course of our business. It also extends to all our joint ventures business, in all countries in which we or our subsidiaries and associates operate. Where we have a minority interest we will encourage the application of this policy amongst our business partners including contractors, suppliers and joint venture partners.

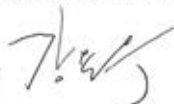
Policy in practice

Dana strives to continually improve its HSSE performance by setting and monitoring clear objectives, supported by its HSSE Standards. This requires the commitment of everyone at Dana and a culture where people are encouraged and feel able to intervene and report on HSSE issues of concern. It is expected that each individual will recognise their responsibility to put our policy into practice.

We will:

- Provide a safe working environment that protects against injury and minimises work-related ill health
- Provide appropriate security protection for employees and assets
- Commit to protect the environment, and so minimise the impact of Dana's operations
- Ensure compliance with applicable legislation and apply Dana's standards and oil industry best practice in locations where local laws do not exist
- Identify and manage HSSE risks in a systematic way as part of Dana's risk management framework
- Create clear accountabilities and expectations for HSSE at every level of the organisation
- Provide resources to successfully manage HSSE risk
- Identify and manage any form of change in our organisation
- Ensure that our employees and contractors are competent and able to perform the work we are asking them to undertake
- Ensure that our employees and contractors understand their HSSE accountabilities and are aware of the behaviours expected by Dana
- Identify and manage operational interfaces internally and with third parties
- Communicate standards based on oil industry best practice which are consistent with legal and regulatory requirements in all operating areas
- Communicate and report openly on HSSE objectives and performance
- Actively engage with relevant stakeholders to understand and take account of their concerns
- Make sure that appropriate emergency response, crisis management and business continuity plans are in place and are regularly tested
- Investigate HSSE incidents, identify root causes, take effective action to prevent recurrence and identify opportunities for organisational learning
- Strive for continuous improvement of Dana's HSSE performance

Yongwoo Kang
Chief Executive Officer



HSSE Management System

Dana is committed to protecting the environment and it manages its activities to minimise potential impacts. Dana meets this commitment within the UK via the implementation and maintenance of an Environmental Management System (EMS) within its One Dana Management System (ODMS).

The ODMS delivers the arrangements to reduce and manage risk, and to implement the company's HSSE Policy. The management system provides an essential framework and rules to ensure Dana's operations are safe, secure whilst minimising environmental impact at all times. The Dana HSSE Policy and Standards provide the framework to help deliver safe and reliable operations that are resilient over the long term and enable continual improvement.

The Dana UK EMS is structured to meet the requirements of Dana's HSSE Standards and was developed in line with elements of the Standard ISO 14001: 2015 and OSPAR Recommendation (2003/5). In line with the ODMS, Dana's UK EMS follows the basic structure of "Plan, Do, Check, Act" (Figure 1).

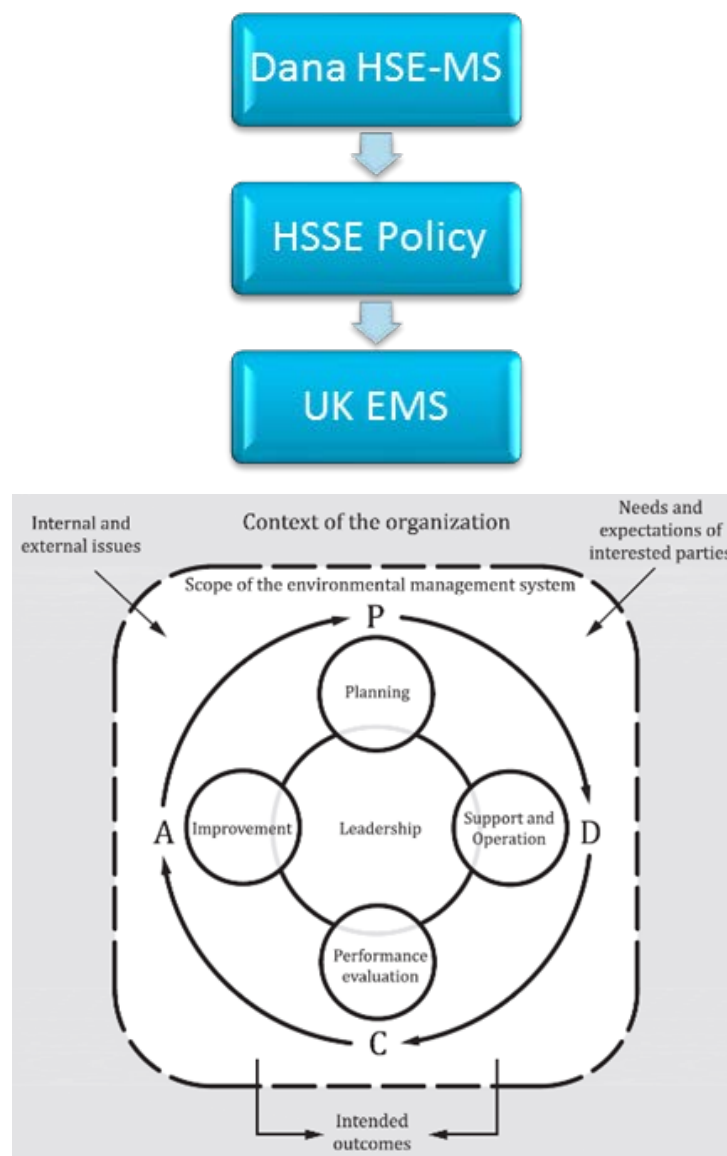


Figure 1: Basic Structure of the EMS and the Components of Each Phase

Overview of Operations

Dana’s portfolio in the UK consists of various exploration, production and development activities throughout the northern, central and southern North Sea.

In the Central North Sea, Dana operates the Greater Guillemot Area (GGA) & Bittern fields that are produced through the Triton FPSO. These developments are located east of Aberdeen (Figure 1).

In the northern North Sea Dana operates the Harris and Barra fields that produce through the Western Isles FPSO. This development is located north-east of Shetland (Figure 2).

Also in the northern North Sea, Dana operates the Hudson field, a subsea development exporting via the Tern A platform that is operated by TAQA.

In addition, Dana has interests in 25 operated and non-operated oil and gas fields and 19 exploration licenses in the UK (Figure 2).



Figure 2: Dana Operated and Non-Operated Production Assets

UK Production Operations

Triton FPSO

Dana has been operator of the Greater Guillemot Area since October 2010 and of the Triton FPSO since October 2012 (Figure 3). The Triton FPSO (Figure 4) is located in the central North Sea (in Block 21/30) approximately 190 km east of Aberdeen. The Triton FPSO produces oil and gas from the Clapham, Pict, Saxon, Guillemot West and North West fields as well as from the Bittern Field (of which Dana became operator in 2018). In 2018, production from the Gannet E field was re-routed from Gannet A to the Triton FPSO. Gannet E is operated by Petrofac on behalf of Tailwind, with Dana being the operator of the Gannet E export pipeline to Triton FPSO.

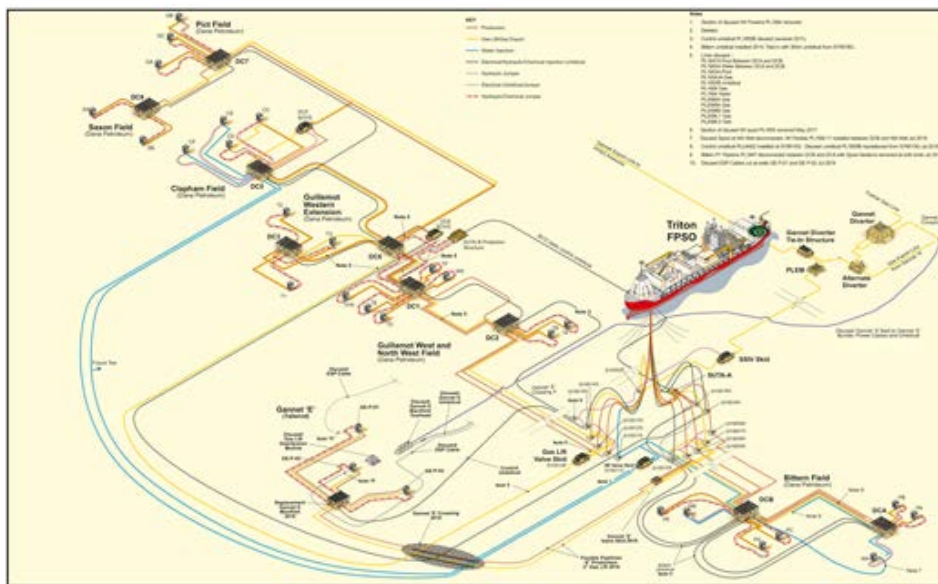


Figure 3: Triton FPSO and Field Layout



Figure 4: Triton FPSO

Western Isles FPSO

The Western Isles FPSO is located in UKCS Block 210/24 approximately 90 km northeast of Shetland. Two subsea templates connect production and water injection wells to the FPSO (Figures 5 and 6) from where oil is exported via shuttle tanker. The Western Isles fields (consisting of the Harris and Barra fields) came on stream in November 2017.

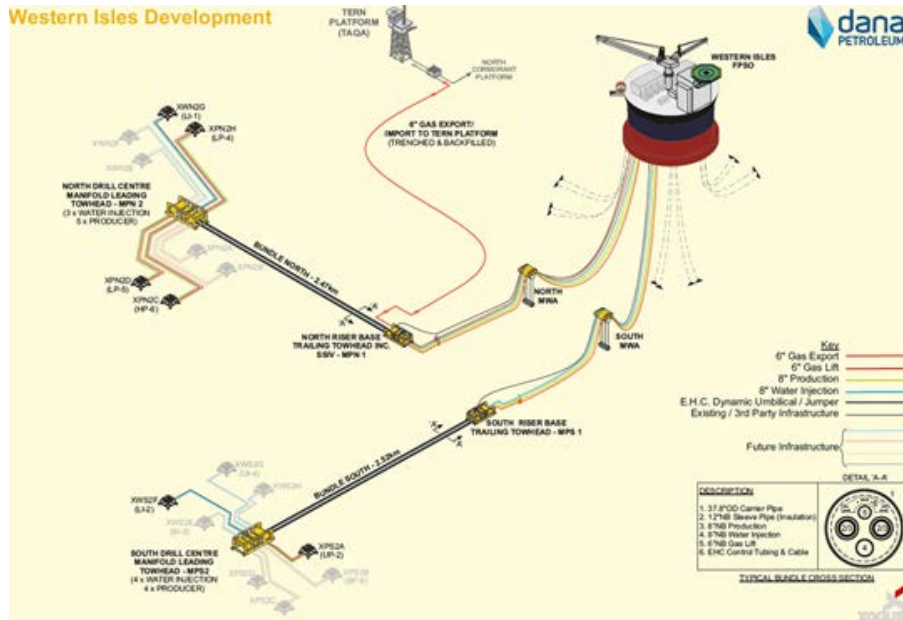


Figure 5: Western Isles Field Layout



Figure 6: Western Isles FPSO

Hudson

The Hudson field is located in Block 210/24a and lies approximately 95 km northeast of Shetland. The field is produced as a subsea tieback via the TAQA operated Tern Alpha platform that is located approximately 10 km to its east.

Drilling Operations

In 2018 Dana drilled the LI-2 water injection well, which ties back to the Western Isles FPSO via the SDC.

Decommissioning Operations

Dana did not conduct any decommissioning operations during 2018.

Environmental Performance

Atmospheric Emissions

Fuel combustion and flaring operations are the principle sources of atmospheric emissions from the oil and gas industry. Carbon dioxide (CO₂) is the main exhaust gas but combustion also results in emissions of CO, CH₄, NO_x, SO_x and VOC's. The largest proportion of Dana's CO₂ emissions is generated by the combustion of fuel for power generation. Dana's 2018 combined emissions for Triton and Western Isles are shown in Figures 7 and 8.

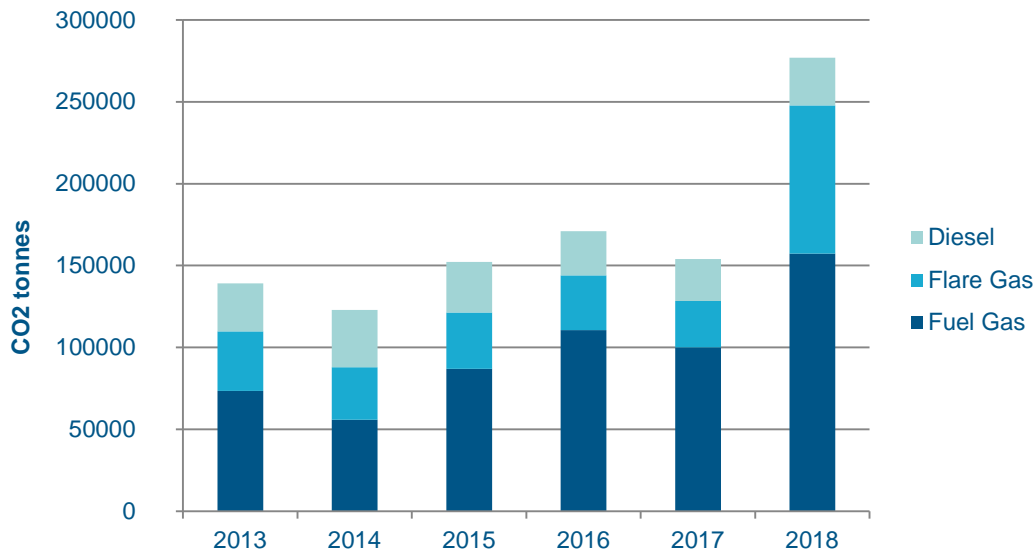


Figure 7: CO₂ emissions from combustion of fuel & flare gas and diesel for period 2013-2018. Triton and Western Isles combined for 2018

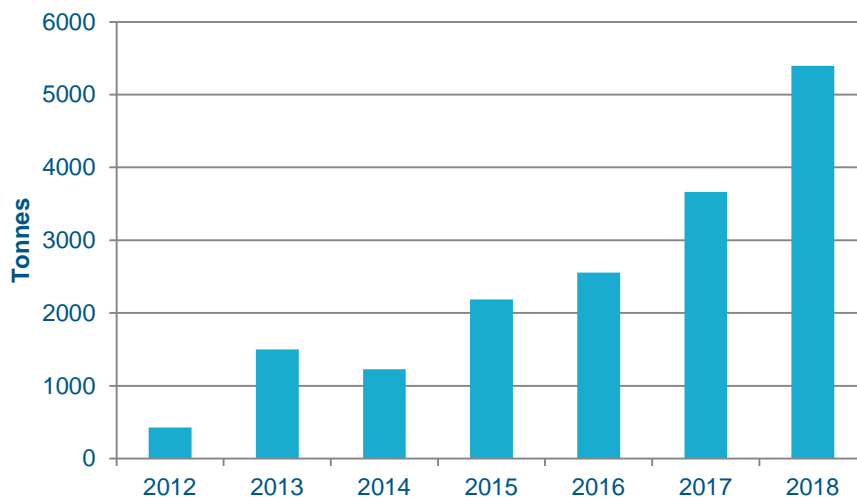


Figure 8: Other atmospheric emissions from combustion of fuel & flare gas and diesel for period 2013-2018. Triton and Western Isles combined for 2018.

Oil in Water

Dana's Oil Discharge Life Permits allow the discharge of produced water from both the Triton and Western Isles FPSO's, provided its oil concentration does not exceed a limit of 30 mg/l (monthly average) for Triton and 25 mg/l for Western Isles.

During 2018, the total volume of produced water discharged from Triton and Western Isles was approximately 2,537,097 m³ that resulted in a total of approximately 117 tonnes of oil being discharged to sea in the year (Figure 9).

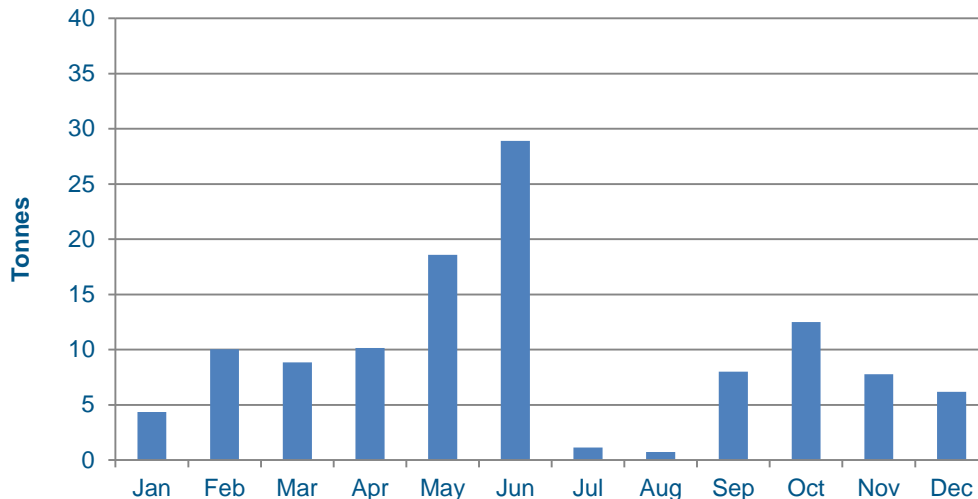


Figure 9: Oil (tonnes) in produced water discharged from Triton and Western Isles in 2018

Hudson produced water is managed by the TAQA as operator of the Tern Alpha platform. During 2018, the total volume of produced water discharged from Hudson's production operations was 1,605,435 m³ that resulted in a total of 18 tonnes of oil being discharged to sea.

Chemical Use and Discharge

A wide range of chemicals is required during drilling, subsea and production operations, the use of which is rigorously risk assessed as part of the permit approval process. The use of chemicals that are deemed to present a greater risk to the environment are restricted as far as possible and detailed justified provided. A number of chemicals have been identified as candidates for substitution (SUB), and wherever possible these chemicals are replaced with alternatives. In 2018, following intensive R&D, Dana replaced corrosion inhibitor on Triton with an alternative that does not have a SUB warning.

In addition to production operations, Dana conducted a number of campaigns including maintenance and repair of subsea infrastructure and drilling most of which resulted in the use and discharge of chemicals. Approximately 52% of the total chemicals discharged in 2018 had the lowest environmental risk rating (PLONOR and OCNS category E) (Figure 10). Approximately 11% of the total chemical discharge for 2018 was as a result of chemicals containing a substitution warning (Figure 11).

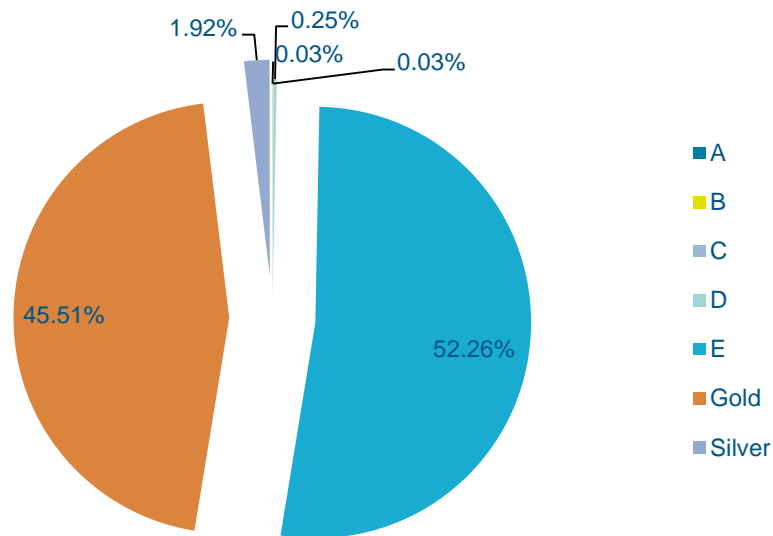


Figure 10: Percentage chemical discharge by label in 2018

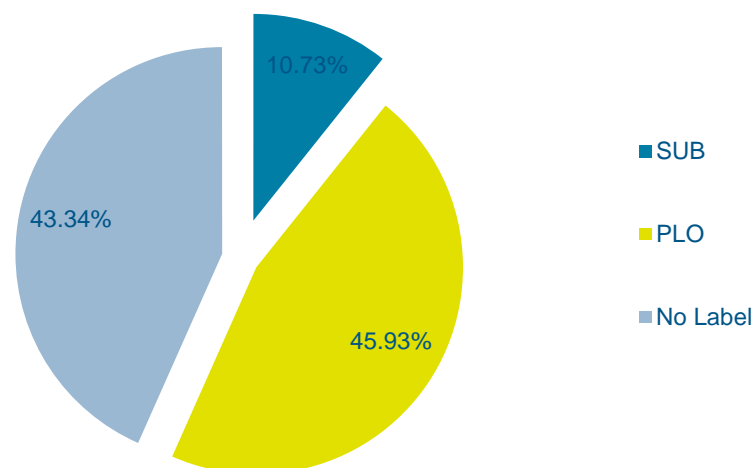


Figure 11: Percentage chemical discharges by OCNS ranking in 2018

Waste

To ensure its minimisation, offshore waste is managed strictly in accordance with the waste hierarchy, however, inevitably some waste is generated from Dana’s operations. All waste is removed to the shore for appropriate disposal, with material being segregated at source into special, general and recyclable categories.

In 2018, a total of approximately 268 tonnes of waste was generated from Dana’s offshore production operations and 209 tonnes from drilling operations. The majority (55%) of production waste was recycled or was converted to energy (25%) (Figure 12). From drilling, 44% of the waste was converted to energy and 35% was drilling cuttings that were returned to shore for treatment (Figure 13).

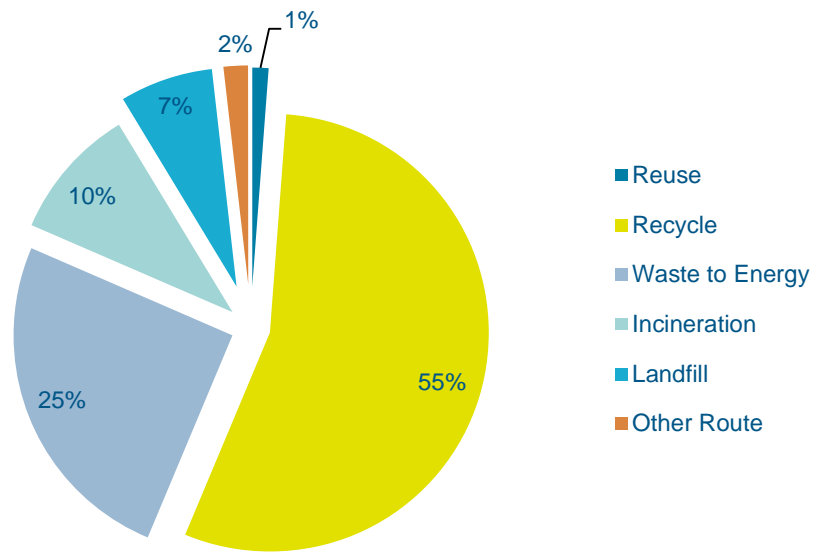


Figure 12: Waste disposed from Triton and Western Isles in 2018

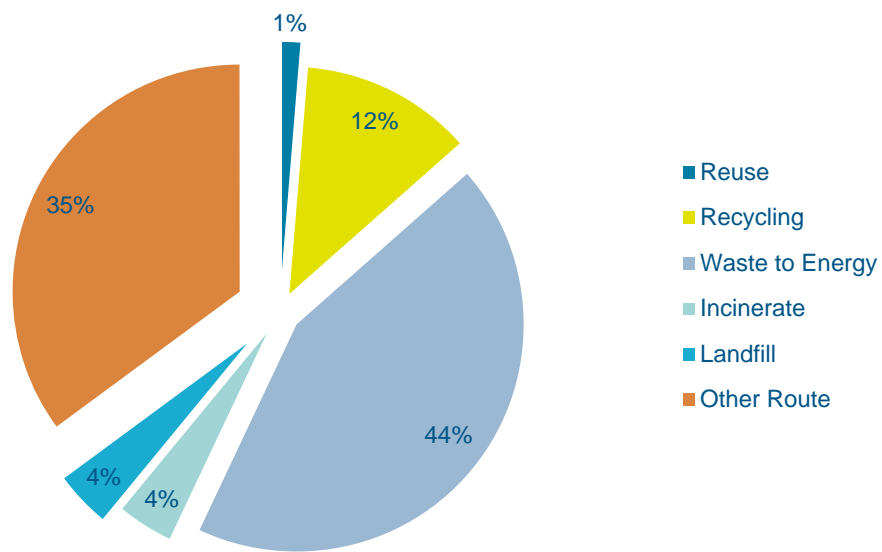


Figure 13: Waste disposed from drilling operations in 2018

Unplanned Releases

Dana has a number of mitigation measures in place to help prevent spills occurring. Additionally, Dana has Regulator approved Oil Pollution Emergency Plans (OPEP) for each asset, as required under the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Conventions) Regulations 1998. An OPEP sets out clearly the procedures that Dana would follow in the event of a spill.

Despite these precautions, a small number of spills occurred in 2018. All of these were reported to the Regulator via a PON1 submission.

Dana reported a total of two unplanned releases of chemicals and six of oil (Table 1). In addition, in 2018 a number of occurrences where oil in water concentration exceed the permitted level were reported to the Regulator.

Operation Type	Chemicals		Oil	
	Number of Notifications	Total Quantity (tonnes)	Number of Notifications	Total Quantity (tonnes)
Production	2	23.7	6	0.53
Drilling	0	N/A	0	N/A

Table 1: Number and volume of spills in 2018



Environmental Performance against Objectives

During 2018 Dana completed a number of environmental achievements. The following Key Performance Indicators, Metrics and Measures were successfully completed (Table 2).

2018 Objective	Performance
Commissioning of oil in water treatment system on Western Isles FPSO	Treatment system commissioned June 2018
Change out of Triton corrosion inhibitor for a non-SUB product	A suitable replacement was identified in 2018; the sub chemical was removed from the chemical permit from the end of 2018
Transition of all OPEPs to CA portal	Completed Q1 2018
Development and roll out of oil spill training manual for Western Isles FPSO	Rolled out to asset Q3 2018
Extend the E-Reps network to Western Isles FPSO	Ongoing

Table 2: Objectives and Performance for 2018

Environmental Objectives for 2019

Dana has developed the following environmental objectives for 2019:

- Re-certification of EMS to ISO14001:2015 compatibility
- Awareness sessions on compliance obligations for maintenance campaigns
- Continued consolidation of E-Rep network to include an internal workshop
- Investigate further chemical SUB replacements for both Triton and Western Isles
- Conduct an ESOS Assessment across all assets and office

