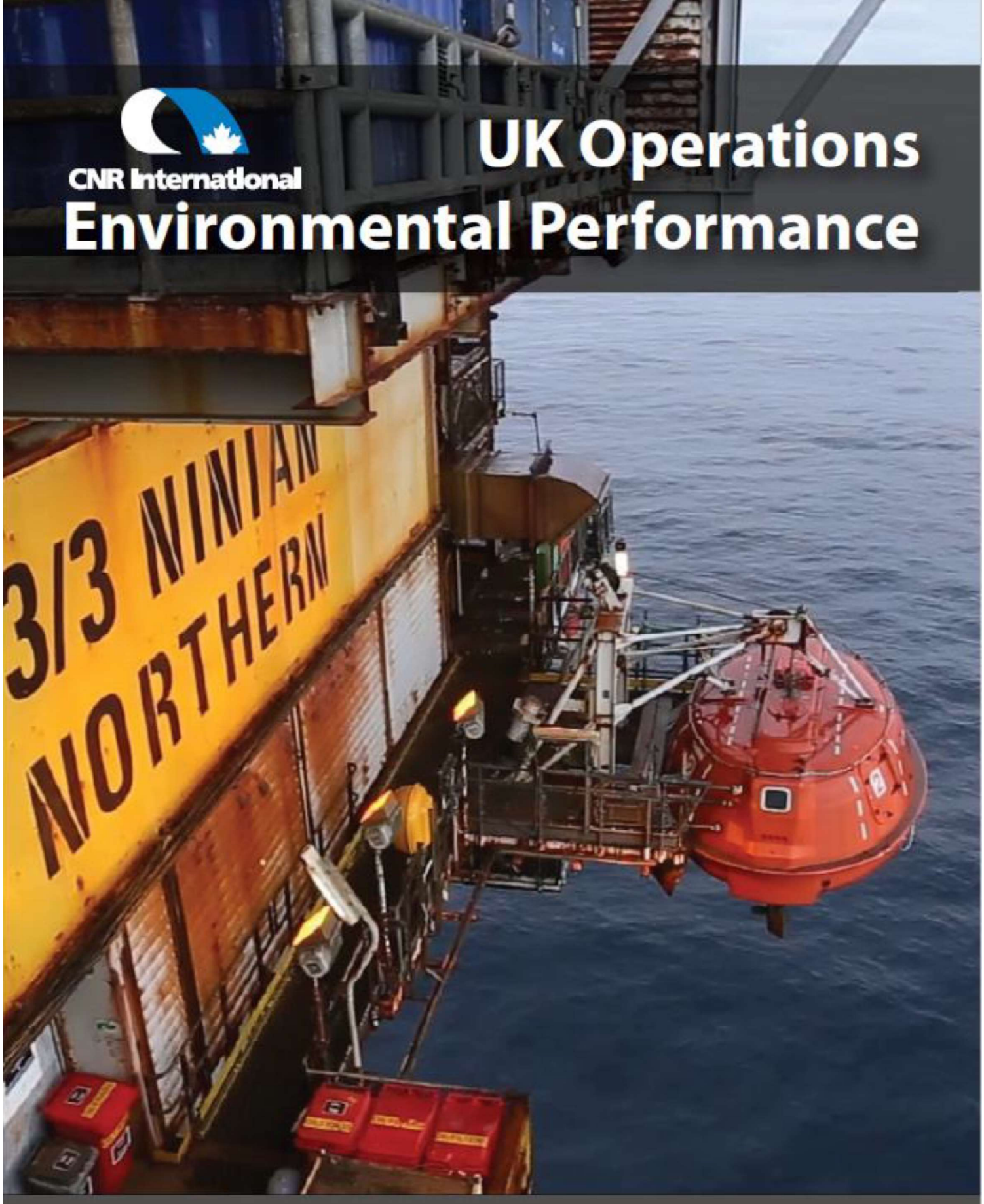
CNR International

UK Operations Environmental Performance



Annual Report 2020

SHE-REP-221

CNR International

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UK Operations
Environmental Performance
Annual Report
2020

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26/05/2021	Final for issue	1	Juliana Kerr SHE Advisor	Sharon McHardy Digitally signed by Sharon McHardy Date: 2021.05.26 15:59:40 +01'00' Sharon McHardy SHE Manager	Mike McKenzie Director Operations
11/05/21	Initial copy for review	0	SHE Advisor	SHE Manager	Director Operations

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1 INTRODUCTION

The 1992 OSPAR Convention is the current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. It combined and up-dated the 1972 Oslo Convention on dumping waste at sea and the 1974 Paris Convention on land-based sources of marine pollution.

Work under the Convention is managed by the OSPAR Commission, made up of representatives of the Governments of fifteen Contracting Parties (including the United Kingdom) and the European Commission, representing the European Community.

The Offshore Oil and Gas Industry Strategy of the OSPAR Commission sets the objectives of preventing and eliminating pollution and taking the necessary measures to protect the maritime area against the adverse effects of offshore activities so as to safeguard human health, and conserving marine ecosystems and, when practicable, restoring marine areas which have been adversely affected.

To implement this Strategy, the OSPAR Commission has adopted Recommendation 2003/5 to Promote the Use and Implementation of Environmental Management Systems by the Offshore Industry. The UK Government has fully adopted this Recommendation, and therefore requires that all Operators controlling the operation of offshore installations on the UK Continental Shelf should have in place an Environmental Management System (EMS) that is designed to achieve:

- the environmental goals of the prevention and elimination of pollution from offshore sources and of the protection and conservation of the maritime area against other adverse effects of offshore activities; and
- continual improvement in environmental performance; and
- more generally, to achieve the objectives of the OSPAR Offshore Strategy.

The OSPAR Recommendation states that Contracting Parties should also encourage Operators to make publicly available an annual statement setting out:

- a brief description of the Environmental Management System;
- the environmental policy of the Operator including environmental goals, objectives and targets set for significant environmental aspects and impacts; and
- a summary of performance in relation to that environmental policy, those goals, objectives and targets, and any relevant legislative requirements.

This report describes CNR International's EMS and company environmental performance against internal targets and legislative requirements. We welcome any comments and suggestions from members of the public and regulators in relation to this document, which should be sent to:

SHE Manager
CNR International (UK) Ltd
St Magnus House
Guild Street
Aberdeen
AB11 6NJ

2 CNRI'S OPERATIONS

Canadian Natural Resources Limited (CNRL) is an independent oil and gas exploration and production company with operations in core areas located in Western Canada, the U.K. sector of the North Sea, and offshore West Africa. CNRL's headquarters are in Calgary, Canada, with international operations (CNR International) based in Aberdeen, Scotland.

During 2020, CNR International UK (CNRI's) North Sea operations were focused in the following areas: Ninians, T-Block, Banff and Kyle, subsea decommissioning operations on Murchison and removal of the Ninian Northern topsides. CNRI operates its fields with a majority working interest, which provides a strong basis for future exploitation and exploration in reserves close to existing reservoirs.

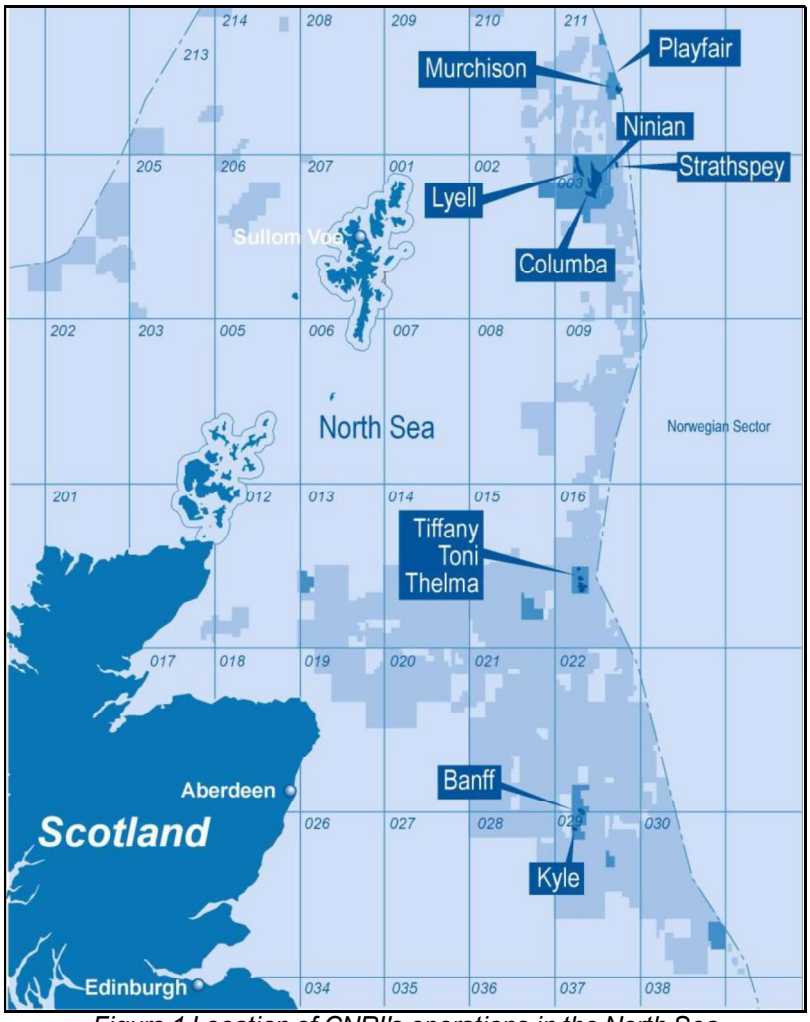


Figure 1 Location of CNRI's operations in the North Sea

The **Ninian** Field hub consists of three fixed platforms (Ninians Northern, Central and Southern) in the Northern North Sea, with the **Columba** field developed as extended reach wells and the **Lyell** and **Strathspey** fields as subsea tie-backs. A third-party subsea tie-back to Ninian Central, Orlando Field, commenced production in March 2019. Crude oil from the Ninian and associated fields is exported through the Ninian Pipeline to the Sullom Voe Terminal, where CNRI has a 63.3% and 24.5% working interest respectively.

The **T-Block** in the Central North Sea consists of three oil and gas fields **Tiffany**, **Toni** and **Thelma**. The Tiffany Field is developed from a traditional fixed steel jacket platform. Toni and Thelma are developed

from subsea templates tied-back to the Tiffany platform. Crude oil from the fields is exported via the Brae/Forties pipeline through the Forties Pipeline System to the INEOS-operated terminal facilities at Cruden Bay.

2.1 DECOMMISSIONING OPERATIONS

The **Murchison Field** is located in the Northern North Sea, close to the UK/Norway boundary. The Murchison platform and associated infrastructure have been decommissioned, with the topsides removal operations completed during Q3 2016 and jacket removal during Q2 2017. The topsides and jacket were transported to shore for dismantling and disposal, which was completed by June 2018, achieving a 96.6% material recycling rate. The final Murchison field reservoir isolation, on subsea well MS/2, was achieved in 2018 and decommissioning of the remaining subsea infrastructure was completed in 2020. The post-decommissioning Environmental Baseline Survey and Clear Seabed Verification scope are scheduled for mid- 2021. The final OPRED and OSPAR Close-out reports will be submitted Q3 2021.

The **Ninian Northern** platform ceased production in May 2017 followed by well plug and abandonment operations and engineering-down and cleaning of the topsides structure. The platform was down-manned in Q2 2018 and entered an idle phase until 2019/2020. The topsides were removed in August 2020. Work is scheduled to prepare the jacket for removal in Q3 2021, with removal operations planned in Q2 2022.

The **Banff** and **Kyle** Fields are located in the Central North Sea and were produced via subsea templates to the Petrojarl Banff Floating Production Storage and Offtake vessel (FPSO), which was operated by Teekay Petrojarl Production. Banff and Kyle cessation of production occurred on 1st of June 2020 with the Banff FPSO and Apollo Spirit Floating Storage Unit (FSO) sailing away in early August 2020. Phase 1 decommissioning programme was completed in 2020, which included flushing and disconnection of all Banff and Kyle pipelines. The Decommissioning Programme for the remaining field infrastructure will be submitted in Q2 2021.

3 CNRI'S SHE MANAGEMENT SYSTEM

CNRI's integrated Safety, Health and Environmental Management System (SHEMS) scope includes offshore oil and gas exploration, production, drilling and decommissioning activities, and associated onshore support. SHEMS helps CNRI to:

- comply with Safety, Health and Environmental (SHE) legislation and industry standards;
- manage SHE risks in the business; and
- monitor and deliver continuous improvement in SHE performance.

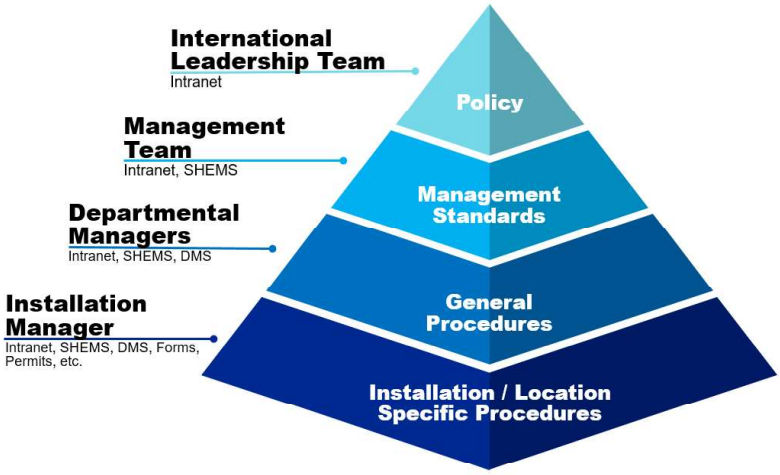
The system structure conforms to the broad principles of the HSE publication Successful Health and Safety Management HS(G)65 and meets the requirements of general and offshore installation-related regulations.

In the North Sea, CNRI's directly operated installations (Ninian Central, Ninian Southern and Tiffany) are certified to ISO14001:2015 by ERM CVS, who are UKAS accredited verifiers of management systems. The subsea infrastructure associated with the Banff and Kyle fields are also included in the scope of our EMS certification.

3.1 SHE MANAGEMENT SYSTEM STRUCTURE

The SHE Management System implemented on CNRI's offshore installations and within the onshore support organisation can be represented as a pyramid consisting of four levels:

- Policy
- Management Standards
- General Procedures
- Installation/Location Specific Procedures



3.2 SHE POLICY

CNRI takes all reasonable precautions to achieve the goal of harm-free operations. Our SHE 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 within which CNRI operates. CNRI's SHE Policy is embeded in CNRL's Corporate Statements on Environmental Protection (see below), Health and Safety, and Asset Integrity Management.

Canadian Natural

CORPORATE STATEMENT ON

ENVIRONMENTAL MANAGEMENT

Environmental stewardship is a fundamental value of Canadian Natural Resources Limited (Canadian Natural). The Company recognizes that every employee and contractor has a vital role to play in identifying, minimizing and mitigating environmental impacts from our operations to improve environmental performance. Canadian Natural's commitment to responsible environmental management will be incorporated into business activities through the following guiding principles:

- Ensure all employees and others engaged on Canadian Natural's behalf are aware of the commitment to improve environmental performance of Canadian Natural's operations;
- Provide strong leadership and promote a participative culture to proactively identify, assess and manage environmental risks and associated impacts;
- Strive to reduce the impacts of our activities through adaptive management while considering social and economic factors;
- Reduce the environmental footprint of our activities by continually improving energy efficiency, managing greenhouse gases, air emissions, water use and other resources; reduce and recycle waste materials and preserve and restore natural biodiversity through closure planning and reclamation;
- Identify significant changes affecting environmental management systems, listen to and respond appropriately to stakeholder issues and concerns and provide a mechanism for feedback;
- Ensure that effective emergency response measures are in place and provide prompt, effective and efficient response to any emergency situation;
- Investigate environmental incidents effectively to prevent recurrence, and communicate and implement lessons learned across all parts of the organization, including those from the experiences of others;
- Engage and communicate with the public regarding Canadian Natural activities;
- Manage tailings and mine waste structures, including water retention structures, safely and responsibly from design to closure; and
- Ensure that Canadian Natural operations comply with government regulations, industry guidelines and company policies and procedures concerning environmental management.

Canadian Natural's Management is responsible for developing specific operational procedures and standards that are consistent with this policy and are accountable for the maintenance, regular review and interpretation of this policy. Canadian Natural expects its suppliers, partners and business associates to have compatible environmental procedures and values.

Canadian Natural's Management is committed to achieving continual improvement in environmental performance through annual environmental objectives, targets, monitoring and measurement. Performance is reviewed and corporate status reports are presented regularly to Management and the Board of Directors.

Tim McKay	Darren Fichter	Scott Stauth
President	**Chief Operating Officer Exploration & Production**	**Chief Operating Officer Oil Sands**

DELIVERING ENVIRONMENTAL EXCELLENCE
Canadian Natural
Doing it Right!

3.3 SHE MANAGEMENT STANDARDS

Ten Management Standards support CNRI's SHE Policy. These describe the expectations and requirements for performance in relation to key aspects of SHE management. They allow for some flexibility in terms of SHEMS implementation, so that different parts of the company can meet these expectations in different ways, depending on their particular legal and other business drivers.

The ten Management Standards are:

1. Leadership and Commitment
2. Performance Management
3. Managing SHE Risks
4. Competence and Personal Development
5. Communication and involvement
6. Working with Third Parties
7. Change Management
8. Information and Documentation
9. Emergency Preparedness
10. Incident Reporting, Investigation and Analysis

3.4 GENERAL AND INSTALLATION SPECIFIC PROCEDURES

General Procedures support specific Management Standards and, where a documented procedure is needed, they describe the arrangements in place to meet the appropriate standard, for example incident investigation or oil spill response. These procedures are intended to provide consistency across the organisation: they are applicable to any operation and are generally not specific to any one location or installation.

Installation and location specific procedures are particular to an operation or activity; they define the arrangements that CNRI has determined are needed to conform to General Procedures and thus meet the spirit and intent of the Management Standards.

4 CNRI'S SIGNIFICANT ENVIRONMENTAL ASPECTS

CNRI's SHE Management System requires identification of the elements of activities that can interact with and therefore have an effect on the environment (called 'aspects' in ISO14001 standard terminology). This is done so that a means to control or minimise any potential negative environmental effects can be put in place.

In common with most offshore oil and gas Operators, CNRI has identified the following significant environmental aspects of its operations:

- Atmospheric emissions, in particular of carbon dioxide;
- Oil discharged to the marine environment;
- Solid waste generation and disposal;
- Chemical use and discharge; and
- Accidental releases (oil and chemical).

CNRI regularly monitors and reports its performance in terms of environmental emissions and discharges as required by UK legislation and the internal SHE Management System. This information is reported via the Environmental Emissions Monitoring System (EEMS), which is a database of environmental information that is accessible by Oil and Gas Operators and by the regulator BEIS (Department of Business, Energy and Industrial Strategy). We also regularly report our SHE performance via monthly and quarterly internal reports, annual SHE performance review and contribute to Canadian Natural's corporate annual Stewardship Report to Stakeholders (available via www.cnrl.com).

5 ENVIRONMENTAL PERFORMANCE

The environmental performance charts below have been compiled using EEMS data to ensure consistency of reporting, apart from the CO_2 Emissions, which uses verified Emissions Trading Scheme data. From the 1st February 2018 the environmental permits for the Banff and Apollo Spirt were transferred to Teekay to comply with the Offshore Safety Directive Regulations 2015. The Banff Greenhouse Gas Emissions Permit (CO_2 emissions) was the only environmental permit that remained with CNRI during 2020.

5.1 ATMOSPHERIC EMISSIONS

The majority of power generated on CNRI's offshore installations is from gas-fired turbines, with diesel utilised as a stand-by fuel. Diesel is also used in discreet applications such as fire-pumps, emergency generators and cranes. CNRI continues to look at emissions reduction opportunities identified in installation specific energy assessments, as well as emissions reduction opportunities identified by both onshore and offshore personnel.

CNRI is a member of the EU Emissions Trading Scheme, which seeks to reduce CO_2 emissions using a 'cap and trade' scheme. During 2020, CNRI installations CO_2 emissions decreased to 0.76 million tonnes (Figure 2), compared to 0.97 million tonnes in 2019 and compared to 0.85 million tonnes in 2018. The decrease in emissions was a result of operational optimisation on all assets, flare reduction initiatives and a reduction in the Banff FPSO emissions as it ceased production on the 1st June 2020.

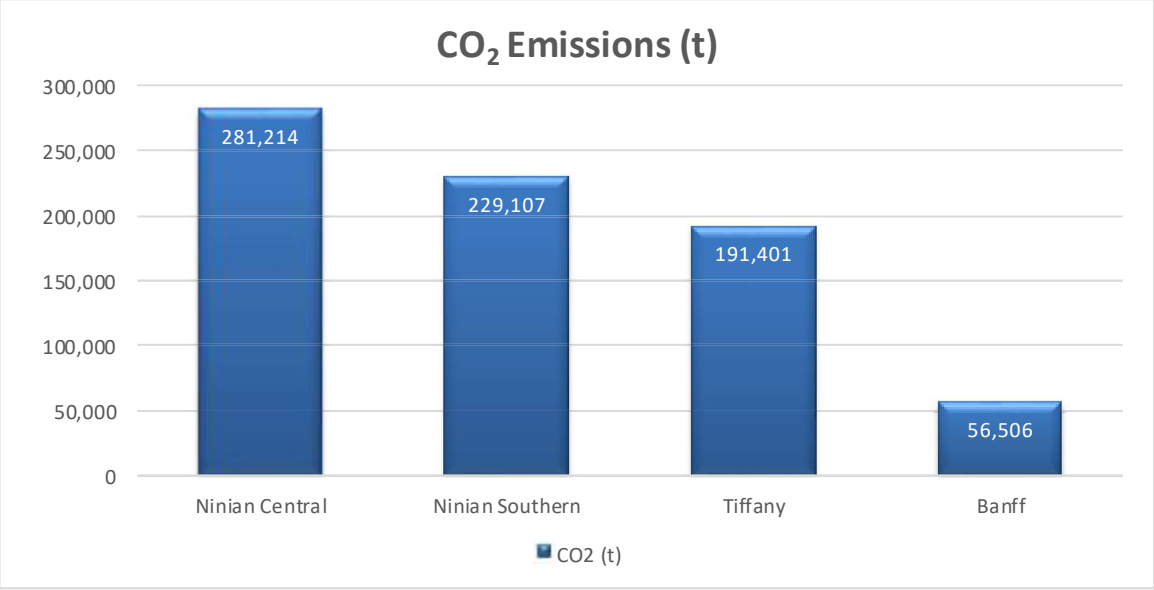


Figure 2 Total carbon dioxide emissions in 2020

CNRI restricts the flaring of gas wherever possible by using it in a variety of ways: produced gas is used for fuel, used for artificial lift to production wells, and exported as sales gas. Installations need to maintain a minimum level of flaring for safety reasons.

The amount of gas flared in 2020 and associated CO_2 emissions were 41% lower than 2019. A total of 0.21 million tonnes of CO_2 were emitted (Figure 3), compared with 0.36 million in 2019 and 0.31 million tonnes in 2018 (of which Banff cessation of production contributed to a reduction of 0.017 million tonnes of CO_2). The main reductions were associated with the completion of the gas rationalisation project on Ninian Central and the reinstatement of the Tiffany gas export route.

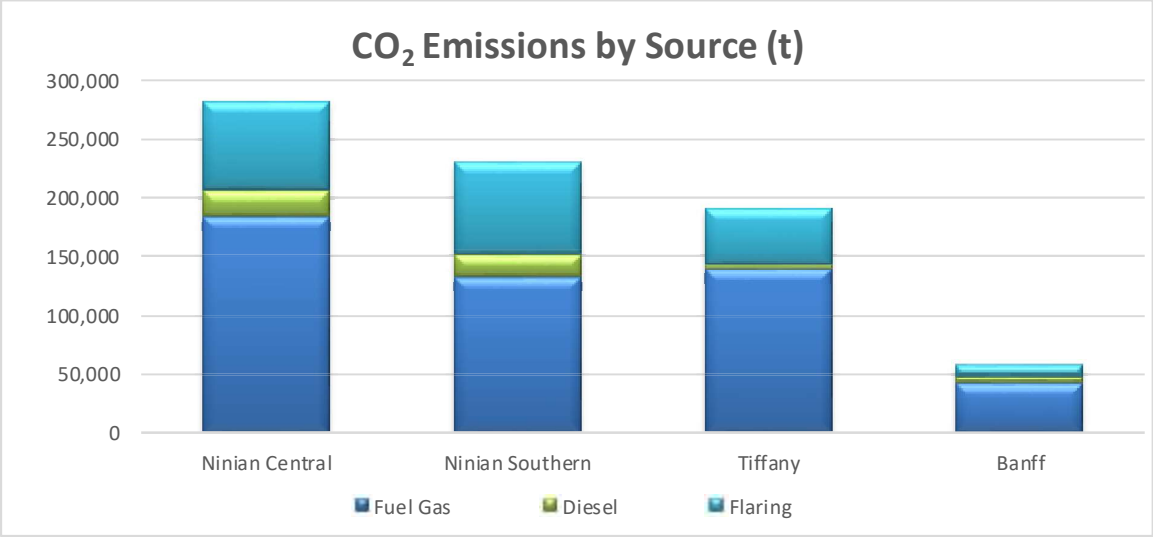


Figure 3 Sources of carbon dioxide emitted during 2020

In addition to CO_2, a range of other atmospheric emissions are regulated under the Pollution Prevention and Control (PPC) Regulations. Figure 4 shows our performance in 2020. The majority of these emissions are derived from power generation on the installations.

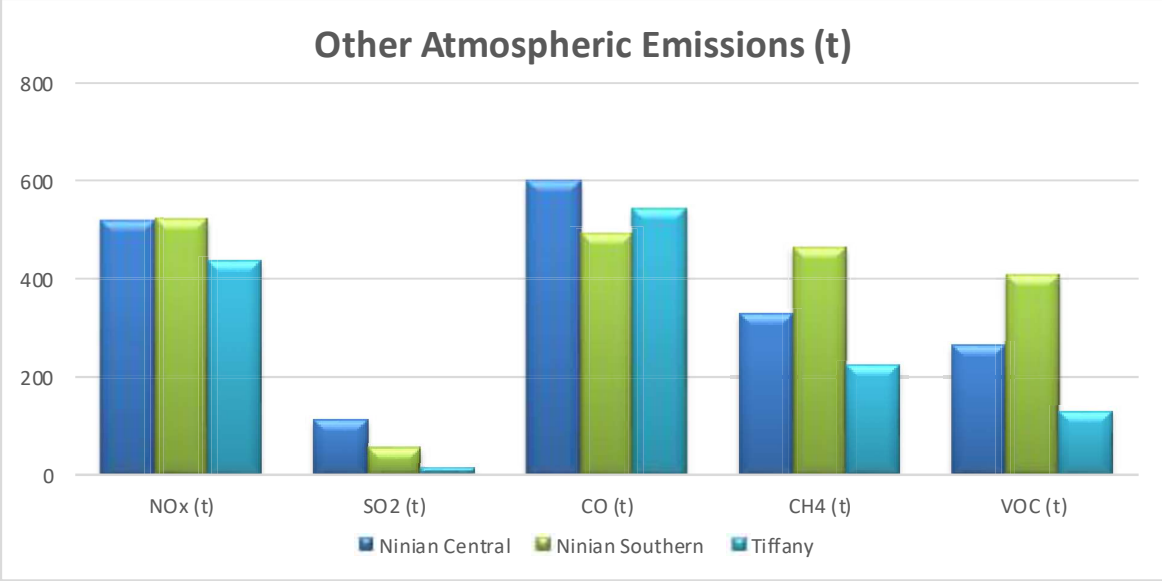


Figure 4 Other atmospheric emissions during 2020

5.2 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, inhibited seawater can be injected into the reservoirs to support hydrocarbon recovery. Both formation and injected waters are eventually produced along with the hydrocarbons and, as an oilfield 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 volume compared with the oil content.

On CNRI's offshore installations, produced water is separated from hydrocarbons in gravity separators and treated to remove as much oil as possible before it is discharged to sea. Because produced water

inevitably contains traces of oil, its discharge to sea is strictly controlled by the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005, which define the average oil content of the water that may be discharged and limits the total amount of oil that may be discharged.

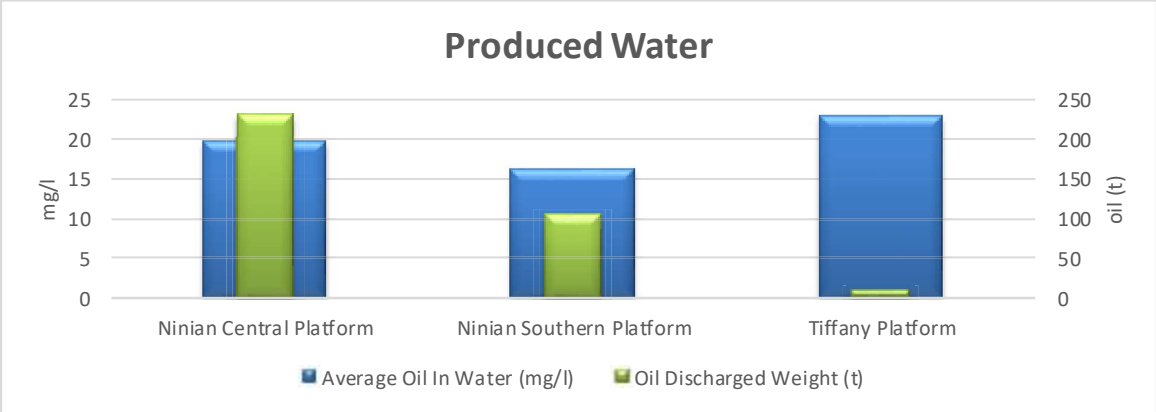


Figure 5 Average oil in water quality and oil discharged in 2020

Average quality of produced water discharged in 2020 across all CNRI UK assets was 18.51 mg/l with no significant changes to the 2019 (17.94mg/l) and 2018 (16.45 mg/l). A total of 18.7 million cubic metres of produced water discharged were discharged in 2020, a small increase when compared to previous two years. Hence the total amount of oil discharged in produced water (347 tonnes) also increased when compared to 2019 and 2018. Produced water quality on each platform over the year was well below the legal limit of 30 mg/l for the monthly average set by the Regulator.

5.3 SOLID WASTE GENERATION AND DISPOSAL

CNRI has to 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 (also known as Special Waste) is governed by specific legislation, which includes strict handling and disposal requirements.

The offshore industry as a whole recycles a large proportion of its waste and CNRI works closely with its waste management contractor to identify recycling routes for as much of its waste as possible. CNRI currently recycles metal, wood, paper and cardboard, glass, plastics, aluminium cans and empty oil/chemical drums. CNRI is also working to reduce the volume of waste generated offshore, especially of hazardous wastes such as oil-contaminated rags and other similar items. CNRI's waste management contractor conducts regular random skip audits and provides monthly lists of 'observations' which allow focus on improvements in offshore waste management.

Operational waste excludes all drilling-related waste (i.e. drill cuttings and tank washings) and decommissioning waste.

In 2020 836 tonnes of solid operational waste (Figure 6) were generated (compared with 1,385 tonnes in 2019 and 1,252 in 2018). CNRI has worked closely with the waste contractor to identify opportunities for reducing our environmental footprint. Diverting wastes from landfill was a key metric introduced in 2018, and a total of 83% of the waste generated in 2020 was routed to recycling, waste to energy and reuse. The amount of waste sent to landfill was 80 tonnes and a further 64 tonnes were routed to other disposal routes (for example incineration of clinical wastes).

Figure 6 Operational waste generated and disposed of during 2020

Drilling waste is primarily made up of drill cuttings and tank washings. In 2020 no drilling waste were sent to shore for disposal as cutting reinjection facilities are present on the Ninian Central Platform. Well intervention and tank washing operations have generated a total of 7 tonnes of liquid waste/sludge. There was no decommissioning waste generated in 2020.

5.4 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. Each chemical used must be risk assessed by the Operator as part of the permitting process, and any chemical which has particular hazardous properties (such as low biodegradability or high toxicity) requires additional justification for its use.

Production chemicals have a number of functions, including corrosion, scale and hydrogen sulphide inhibitors and biocides to prevent microbial souring of reservoirs. Also deoilers and demulsifiers to help to separate oil from produced water. When compared to 2019, the total amounts of production chemicals used during 2020 (Figure 7) increased by 9% and discharges increased by 15% following the transition of chemicals vendor and introduction of Orlando field production fluids. Optimisation of production chemical usage is ongoing and new trials scheduled to take place in 2020 and 2021.

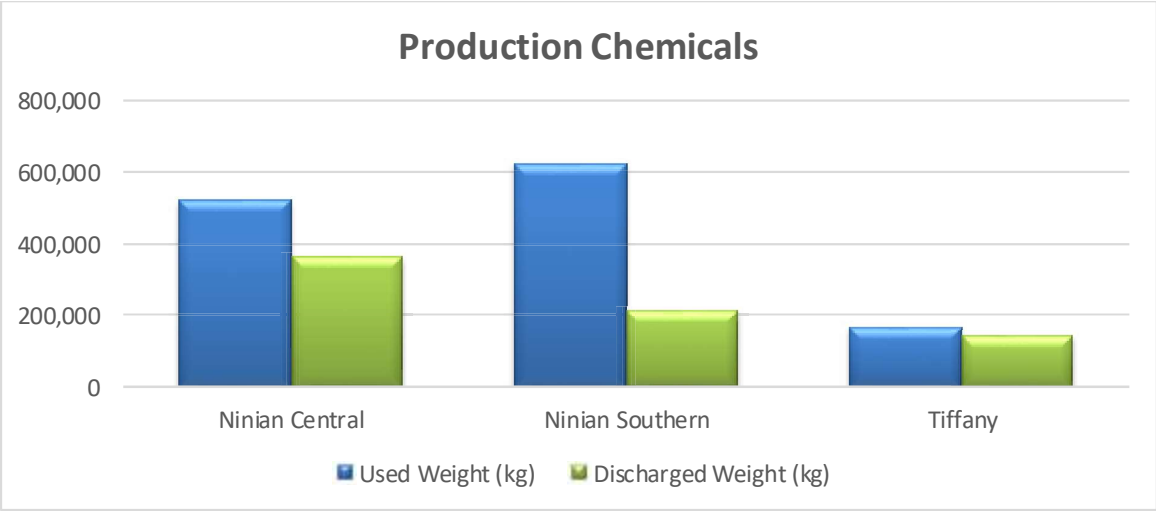


Figure 7 Production chemical usage and discharge during 2020

A wide range of chemical products are used during drilling operations, including complex fluids known as drilling muds, which are used to cool and lubricate the drill bit, to remove rock cuttings from the well bore, to prevent the hole from collapsing, to cement casings and clean wells. Chemicals are also used during intervention and workover operations, including during emergencies, for example to prevent losses of drilling fluids to the formation.

The chemicals used and discharged during drilling and intervention operations are a reflection of activity during the year. The vast majority of these chemicals are not discharged to sea, as seen in Figure 8. Of those discharged to sea during 2020, by weight 99.7% were classed as Posing Little or No Risk (PLONOR), and 0.3% had no warning associated with their use. There were no SUB warning chemicals discharged during these operations.

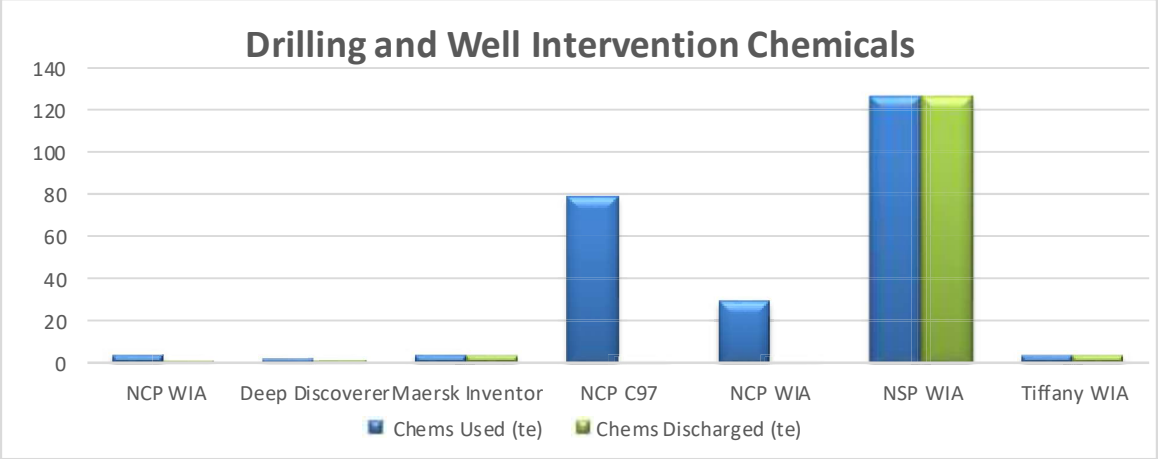


Figure 8 Drilling and well intervention chemical usage during 2020

During 2020 there were no chemical usage and discharges associated with pipelines and decommissioning operations.

Two chemicals with substitution warnings were removed from Production Chemical Permits in 2020. Chemicals trials due in 2020 have been delayed. Further trials are planned once restrictions to movement of personnel are lifted. The production chemical supplier is continuing to assess further reductions in the use of chemicals that carry substitution warnings.

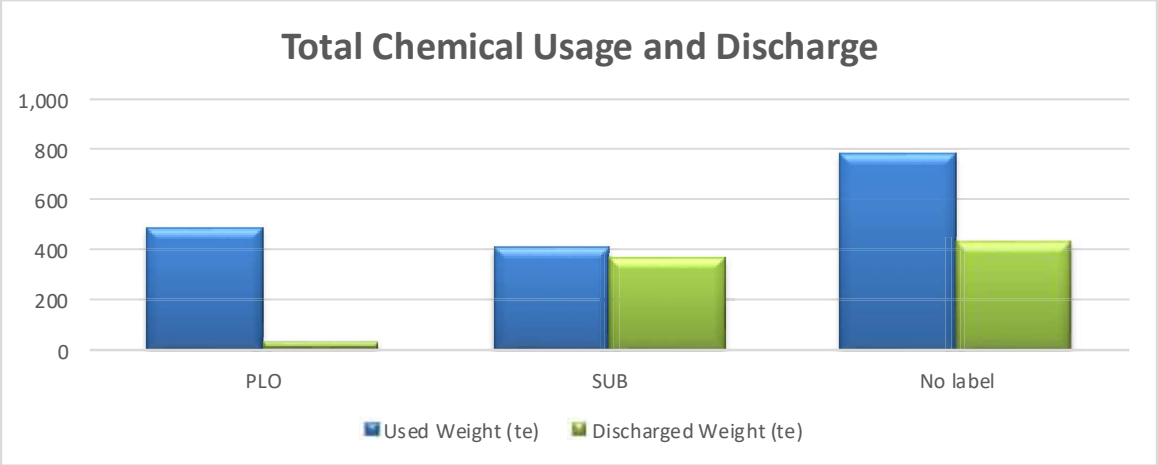


Figure 9 CNRI's chemical usage by CEFAS label during 2020 (all operations)

5.5 ACCIDENTAL RELEASES AND PERMIT NON-CONFORMANCES

All discharges of oil to sea, other than those regulated under an 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 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.

CNRI takes its responsibility to prevent accidental discharges of oil and chemicals to sea very seriously. Procedures are in place to prevent spills (during chemical or diesel handling for example) and our Integrity Management System is designed to ensure that hydrocarbons remain securely within the process system on all installations.

CNRI investigates all accidental releases to sea and permit non-conformances to ensure that lessons are learned and actions are identified and carried out to prevent reoccurrence. Government approved Oil Pollution Emergency Plans (OPEPs) are in place for all offshore installations and CNRI is a full member of Oil Spill Response Limited, the world's largest spill response organisation.

A total of 9 accidental releases were reported in 2020, of which 5 were oil spills and 4 were chemical spills. In total, 0.61 tonnes of oil were spilled to sea during 2020, compared with 0.016 tonnes in 2019 and 0.37 tonnes in 2018. A further 4 chemical releases were reported, with a total of 9.57 tonnes of chemicals spilled to the sea, compared to 5.8 tonnes in 2019 and 1.12 tonnes in 2018. The most significant contributor to this was a single event from a subsea release on our Thelma field, which was isolated and repaired during 2020.

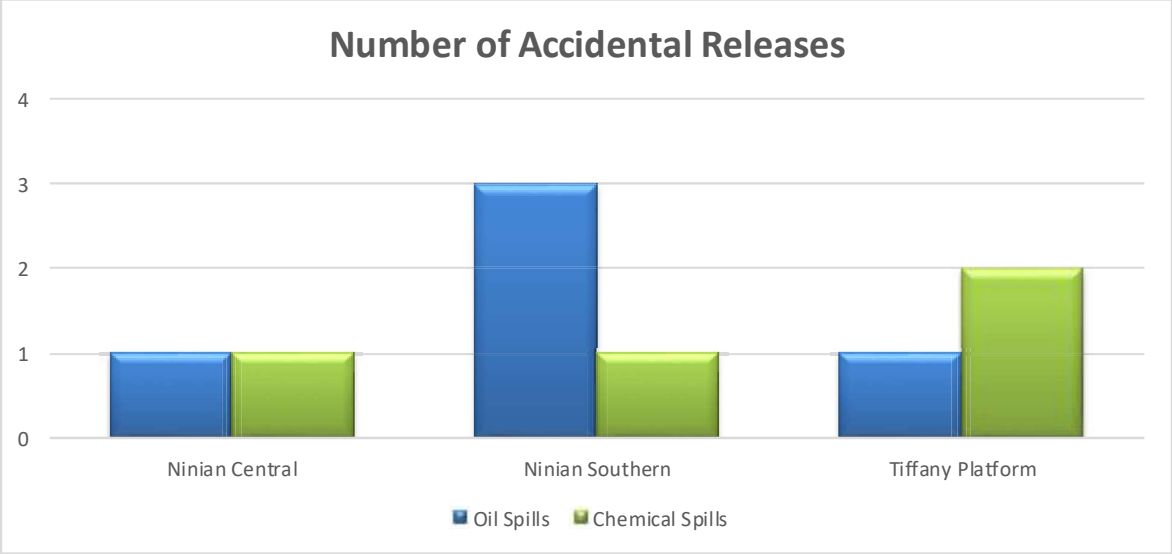


Figure 10 Oil and chemical spills during 2020

4 PON1 Permitted Discharge Notifications were related to produced water separation issues resulting in abnormal sheens or 'out of spec' water quality, compared to 10 in 2019. 3 of the Permitted Discharge Notification were coupled with OPPC non-compliances due to intermittent separation issue encountered on Ninian Central as discussed below.

CNRI submitted 16 non-compliances related to Oil Discharge Permits issued under the Oil Pollution Prevention and Control (OPPC) Regulations in 2020, which is a reduction from 41 in 2019. 15 of these events were associated with Ninian Central. The Enforcement Notice (issued May 10, 2019) served in relation to ongoing oil-in-water separation issues on Ninian Central was rescinded during 2020 after the successful implementation of an improvement plan to improve stability and consistency of oil-in-water performance on Ninian Central.

6 2020 ENVIRONMENTAL TARGETS

CNRI develops an annual SHE Improvement Programme for all of its operations. This programme includes targets for a series of leading and lagging performance indicators and sets out the means by which these are to be achieved, as well as improving company SHE performance in general.

For 2020, four specific environmental targets were set, based on the historical performance of CNRI's operations in both UK and West Africa:

- To have fewer than 0.29 reportable spills per million barrels of oil equivalent production (BOE)
- To spill less than 0.03 tonnes of oil per million BOE
- To achieve an average oil in produced water concentration of < 20 mg/l
- To emit no more than 0.051 tonnes of carbon dioxide per BOE

How did we perform against these targets?

- ☑ Reported 0.28 oil spills per million BOE
- ☑ Spilled 0.03 tonnes of oil per million BOE
- ☑ Achieved average oil in produced water concentration of 18.15 mg/l
- ☒ Emitted 0.056 tonnes of carbon dioxide per BOE

Whilst emissions were reduced significantly across our operations, the intensity value was offset by reductions in oil production volumes, resulting in the associated KPI being missed in 2020.

The 2021 SHE Improvement Programme for the UKCS includes key performance indicators for oil discharged in produced water, number and volume of reportable spills and leaks, and greenhouse gas emission intensity. Performance against these targets will be reported in the 2021 Environmental Performance Annual Report.

CNR International

THE PREMIUM VALUE DEFINED GROWTH INDEPENDENT