BUMIARMADA

2023 UKCS ENVIRONMENTAL STATEMENT

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1.0 INTRODUCTION

This statement has been prepared to fulfil the regulatory requirement under the OSPAR recommendation 2003/5 to produce an annual public environmental statement. It represents an open and transparent representation of the Armada Kraken FPSO environmental performance for 2023.

1.1 Bumi Armada Overview

Bumi Armada Berhad (BAB) is a Malaysia-based international provider of offshore production and support services with a presence in over 17 countries, spread across five continents, supported by over 1,700 people from 49 nationalities.

Bumi Armada UK Limited (BAUK) is the UK arm of the FPO Operations business unit, which was formed to operate the Armada Kraken FPSO on behalf of EnQuest.

Under the Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015 (SI 398/2015) BAUK has been appointed as the Installation Operator for the Armada Kraken FPSO and are the appointed Installation Operator under the Offshore Petroleum Licensing (Offshore Safety Directive) Regulations 2015 (SI 385/2015).

1.2 Armada Kraken FPSO

The Armada Kraken FPSO is based upon the conversion of the 2007 built Suezmax sized conventional trading tanker Prisco Alcor (Figure 1). As a trading tanker, the vessel was classed with DNV as 1A1 ICE-1A (for max draught of 15.4 m) Tanker for Oil ESP SPM EO VCS-2 CLEAN TMON NAUTICUS (new building) and was built by Hyundai Heavy Ind. Co. Ltd. The vessel has undergone R&LE to strengthen the hull to withstand the expected conditions of the North Sea.

1.3 Kraken Operations

The Kraken Field is located in Block 9/2b in the southern part of the East Shetland Basin in the northern North Sea. This area is approximately 130 km east of the nearest landfall at Noss, the Shetland Islands and 44 km west of the UK/Norway trans-boundary median line (Figure 2). The development consists of the North, Central and South Kraken Fields which all lie within UK Block 9/2b. The field was initially discovered in 1985 with further appraisal carried out over the period 2007-2013. Oil recovery is a line-drive horizontal well water-flood development consisting of 14 production and 12 injection wells. The wells are tied back to the Armada Kraken FPSO from 4 production/injection drilling centres. First oil from the Armada Kraken was achieved on 23rd June 2017.

Figure 1 - Armada Kraken FPSO

Figure 2 - Location of Kraken on the UKCS.

2.0 ACRONYMS

2.1 Acronyms / Abbreviations

Table 1 – Abbreviations

Acronym / Abbreviation	Definition
BAB	Bumi Armada Berhad
BAUK	Bumi Armada UK
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
EMS	Environmental Management System
ETS	Emissions Trading Scheme
FPO	Floating Production and Operation
FPSO	Floating Production Storage and Offloading
GHG	Greenhouse Gas
HS&E	Health, Safety & Environment
HSSEQ	Health Safety Security Environment and Quality
OiW	Oil in Water
OMS	Offshore Marine Services
OPEP	Oil Pollution Emergency Plan
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo Paris Convention
OSV	Offshore Support Vessel
PON1	Petroleum Operations Notice
PW	Produced Water
mg/l	milligrams per litre
R&LE	Repair & Life Extension
SC	Subsea Construction
WI/HSP	Water Injection/Hydraulic Submersible Pumps
UKCS	United Kingdom Continental Shelf

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

BAUK implements and operates an integrated Health, Safety and Environment Management System (HS&E MS) which has been accepted and endorsed by the Board and embedded in the overall business culture. The HSE MS is an integral part of the overall management system. It is laid down in policies, procedures, standards and work instructions. Its general purpose is to prevent BAUK activities from putting people, the environment, property or the reputation of the company at risk. The Bumi Armada HSSEQ Policy is shown in Figure 3.

The Environment Management System (EMS) has been verified against the requirements of the OSPAR 2003/5 criteria.

Figure 3 - Bumi Armada HSE Policy.

BUMIARMADA

HEALTH, SAFETY, SECURITY & ENVIRONMENT (HSSE) MANAGEMENT POLICY

COMMITMENTS

The "Company" (herewith refer to Bumi Armada Berhad and all its subsidiaries and joint ventures that are within its management and operational control) is committed to operating our business with the objective of safeguarding the people, environment, asset and reputation in locations where we operates. The "Company" shall manage HSSE in line with this policy to ensure:

- Health and Safety of our employees, contractors and those (including the communities) who could be directly impacted by our business activities;
- Compliance with all relevant HSSE regulations and local governmental rules, and to adopt existing standards in regions where laws and regulations do not exist;
- Protection of the environment and the communities in which we operate through pollution prevention, waste management and emission minimisation;
- Mitigation of physical security risks to our employees, contractors and assets through adoption of relevant international security standards and statutory compliance;
- Continual improvement in HSSE performance through implementation of Integrated Management System (IMS) for all activities;
- Ensure operation integrity through the development and implementation of Process Safety Management (PSM) to reduce, and ultimately eliminate, fatal and high severity Process Safety Event (PSE).

PRINCIPLES

To achieve these objectives, the "Company" will operate with the following principles:

- Demonstrate and promote visible leadership commitment and employee participation to ensure health and safety of employee, the protection of the environment and the delivery of quality products / services;
- Encourage consultation and participation of workers, and, where they exist, workers' representatives on HSSE related matters;
- Promote and foster a culture of collaboration and participation among all employees in the implementation of our HSSE commitments;
- Eliminate identified hazards and reduce HSSE risks, including associated Cyber Security risks to As Low As Reasonably Practicable (ALARP) throughout the asset lifecycle by providing safe and reliable design and operational asset integrity processes;
- Demonstrate our capability to plan for, respond to, and recover from any HSSE emergency or crisis;
- Monitor and report our HSSE performance throughout the "Company" as a means of providing feedback and promote continuous improvement across the organisation.

GARY CHRISTENSON
Executive Director / Chief Executive Officer
Date: 20th June 2022

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4.0 ENVIRONMENTAL PERFORMANCE

The environmental statistics presented in this document cover the period 1st January 2023 until 31st December 2023.

4.1 Discharges To Sea

During normal production, water is produced when extracting hydrocarbons from the reservoir. Despite treatment, produced water still contains traces of oil and as such, produced water discharge is controlled via a permitting system managed by the UK regulatory authority, OPRED. The Oil Discharge Permit held by BAUK allows us to discharge produced water provided the hydrocarbon concentration is within the limit set out in the permit.

Discharges to sea include chemicals used in offshore production operations. During production operations, chemicals such as scale inhibitors, corrosion inhibitors, demulsifiers and biocides are used to assist with the separation of oil and water, prevent damage to infrastructure such as pipelines and to prevent 'souring' of the reservoir. Any chemical used offshore during oil and gas production must be approved by the Centre for Environment, Fisheries and Aquaculture Science (Cefas). The use and discharge of production chemicals is controlled under the Offshore Chemical Regulations 2002 (as amended).

BAUK, its contractors and chemical suppliers work on a continuous basis to use environmentally acceptable alternatives where possible in our operations through the chemical management process.

4.2 Spills

Given the nature of our activities, there is always a risk that accidental spills may occur. All spills to sea, regardless of volume, must be reported to OPRED via a Petroleum Operations Notice (PON1).

A number of processes are in place to prevent unplanned releases, and these include planned maintenance of equipment, asset integrity inspections, activity risk assessment, area inspections, procedural controls and training and competency for individuals. BAUK also internally record and investigate any unpermitted releases of hydrocarbons or chemicals. This helps improve our understanding of the root causes and identify actions to prevent similar incidents occurring in the future.

4.3 Atmospheric Emissions

Atmospheric emissions arise during offshore production operations predominately as a result of fuel combustion for power generation, boilers and gas flaring activities. Atmospheric emissions generated by these activities are regulated by the Greenhouse Gas Emissions Trading Scheme (ETS) and the Offshore Combustion Installation (Prevention and Control of Pollution) Regulations 2013.

BAUK deployed Emissions AI software during 2023 to monitor emissions and identify opportunities to reduce Greenhouse Gas (GHG) emissions. The software has assisted BAUK in successfully reducing emissions from a range of systems, such as the Sulphate Reduction Unit and Seawater Heater system, by enabling real-time emissions monitoring to assess how operating philosophies and process modifications can mitigate GHG emissions from the Armada kraken FPSO.

4.4 Waste Management

Armada Kraken operations consume natural resources and other material which generate a range of wastes. BAUK ensures that the segregation, transportation and eventual disposal of waste is managed in accordance with legislative requirements. BAUK works closely with its onshore waste management contractors to identify recycling routes for as much of its waste as possible and conducts regular audits to evaluate waste management practices.

5.0 DISCHARGES TO SEA

BAUK aims to minimise the environmental impact of the discharge of produced water. Produced water treatment removes most hydrocarbons and solids present in the produced water stream. All waste water is treated and monitored prior to discharge.

5.1 Oil in Water

As produced water contains traces of hydrocarbon, the Offshore Petroleum Activities (Oil Pollution, Prevention & Control) Regulations 2005 (as amended) sets the monthly permitted average oil content of produced water at 30 mg/L. The average oil concentration in produced water (Figure 4), produced water volume discharged to sea (Figure 5) and the total mass of oil discharged to sea (Figure 6) for each produced water discharge route is presented below. The WI/HSP Pump Min Flow discharge exceeded the 30mg/L legal limit with a yearly average of 40.1mg/L. However, the quantity of oil discharged via this route was minimal at 0.4 tonnes (as shown in Figure 6). The PW Transfer pump discharge also exceeded the 30mg/L legal limit with a yearly average of 30.3mg/L. Whilst the yearly average exceeded 30mg/L, the quantity of oil discharged via this route was also minimal at 5.6 tonnes (as shown in Figure 6).

Figure 4 - Average oil concentration (mg/L) in produced water by discharge route in 2023.

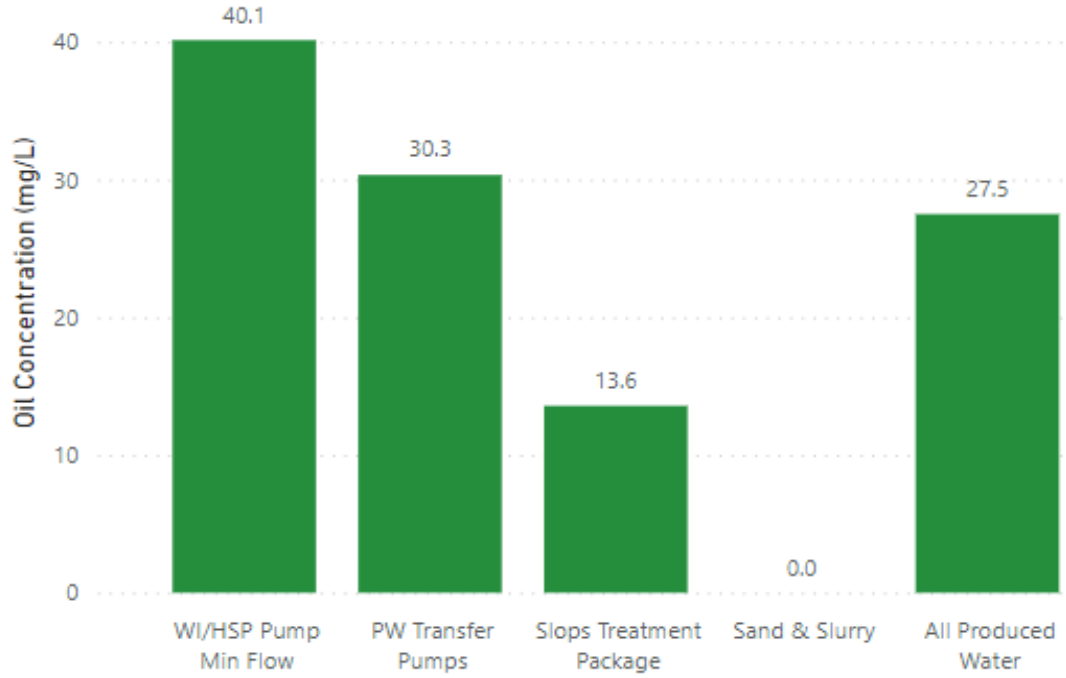


Figure 5 - Volume (m^3) of produced water discharged to sea by discharge route in 2023.

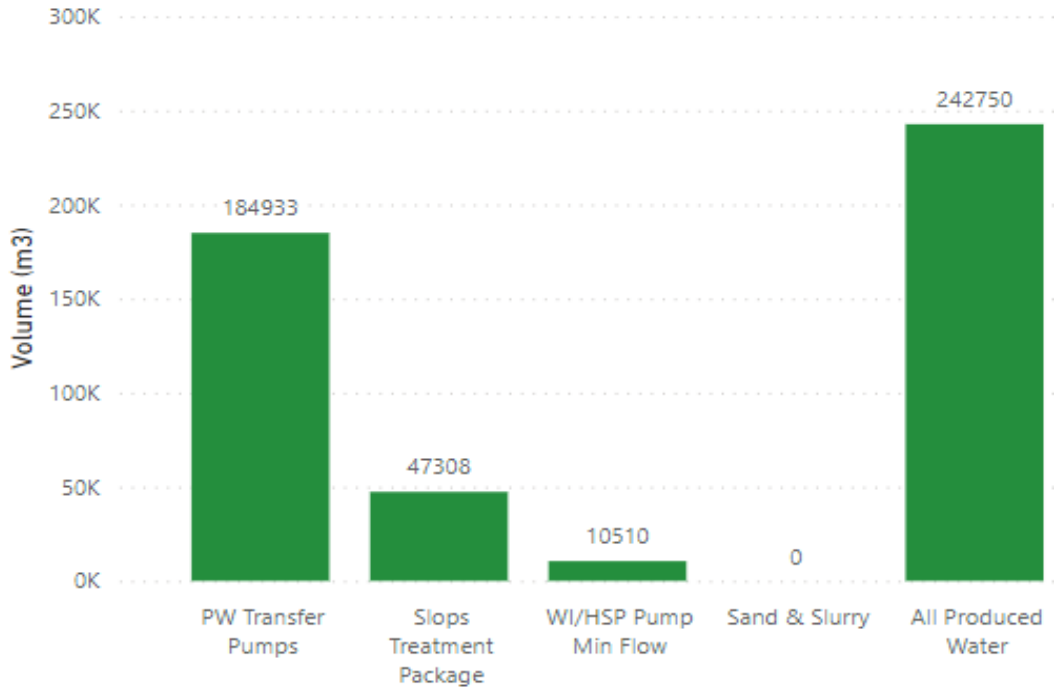
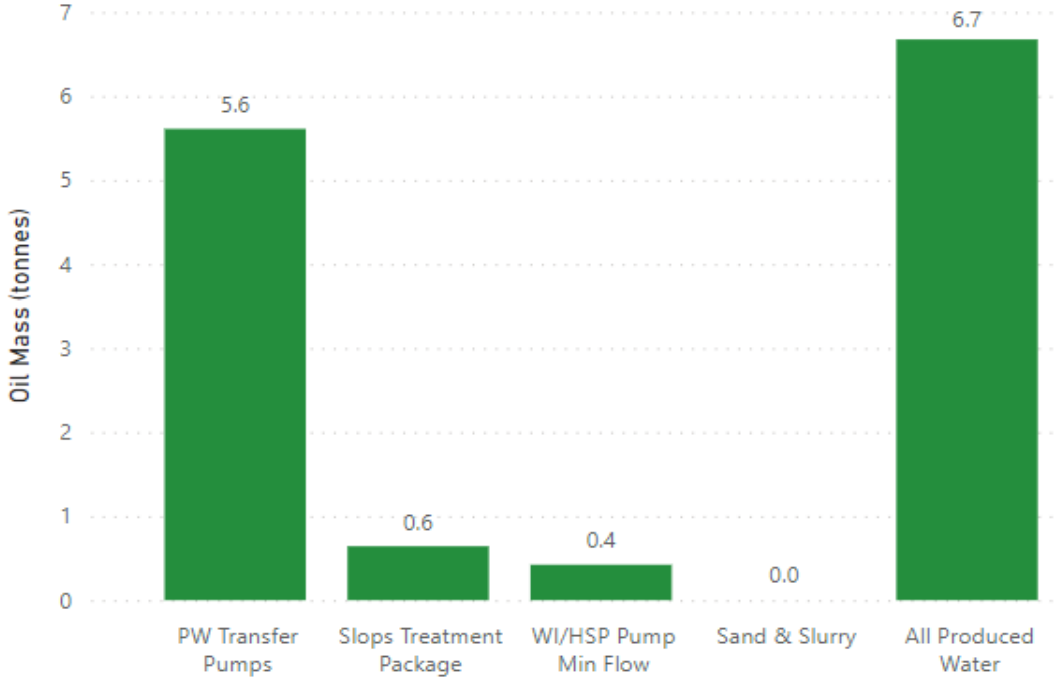


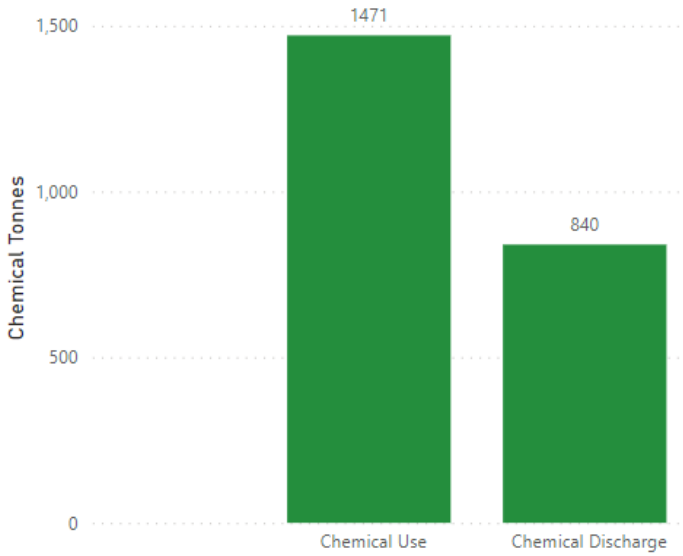
Figure 6 - Mass (tonnes) of oil in produced water discharged to sea by discharge route in 2023.



5.2 Chemical Usage

Total chemical use and discharge by the Armada Kraken FPSO in 2023 is shown in Figure 7.

Figure 7 - Total chemical use and discharge to sea in 2023 (tonnes).



6.0 SPILLS

As spills at sea can have consequences for the marine environment, BAUK work to minimise the risk with a focus on prevention. BAUK has an approved oil pollution emergency plan (OPEP) in place and completes regular spill exercises to ensure spill response procedures are robust, equipment is available, and personnel are competent in the event of a spill to sea.

6.1 Number Of Spills

All spills to the marine environment, regardless of their volume, must be reported to OPRED via a Petroleum Operations Notice (PON1). There were no PON1s were submitted to OPRED during 2023, extending the period without a spill to sea to over two years.

6.2 Mass Of Spills

No spills were reported to OPRED during 2023 and therefore, no mass of oil or chemical was spilled to sea.

7.0 ATMOSPHERIC EMISSIONS

The Armada Kraken operation uses energy during the extracting, processing and exporting of oil. BAUK manages energy consumption efficiently to reduce the emissions from Armada Kraken operations. Figure 8 and Table 1 provide the detail of verified Armada Kraken GHG 2023 emissions expressed as a CO_2 equivalent (CO_2e). In 2023, the Armada Kraken FPSO produced 230,229 tonnes CO_2e with 99% of all emissions resulting from diesel combustion, natural gas combustion and gas flaring activities.

Figure 8 - Percentage breakdown of 2023 Armada Kraken GHG emissions (CO2e) by emissions source.

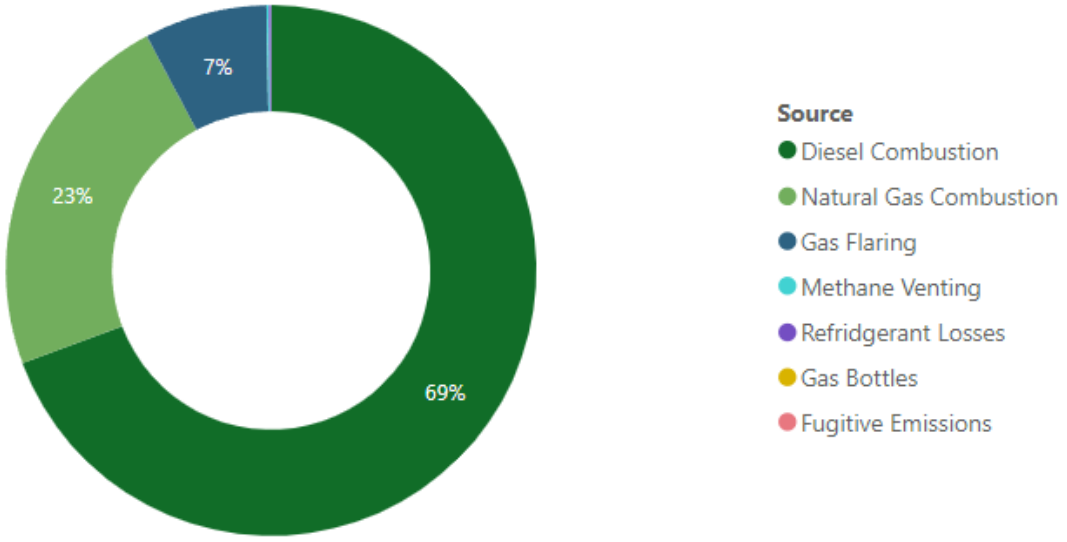


Table 2 - 2023 Armada Kraken GHG emissions (tonnes CO2e) by emissions source.

Source	Tonnes CO2e
Diesel Combustion	159602
Natural Gas Combustion	52750
Gas Flaring	17219
Methane Venting	341
Refridgerant Losses	316
Gas Bottles	1
Fugitive Emissions	1
Total	**230229**

8.0 WASTE MANAGEMENT

Armada Kraken operations consume natural resources and other material which generates a range of wastes. BAUK manages waste according to the waste management hierarchy – Prevention, Reuse, Recycle and Recover. BAUK seeks to minimise the quantity of waste disposed to landfill and this disposal method is only used if no alternative disposal method is available. Figure 9 and Table 2 presents the disposal method of waste that was generated by the Armada Kraken FPSO in 2023. The total quantity of waste generated by the Armada Kraken FPSO in 2023 was 198 tonnes.

Figure 9 - Percentage breakdown of 2023 Armada Kraken operational waste by disposal route.

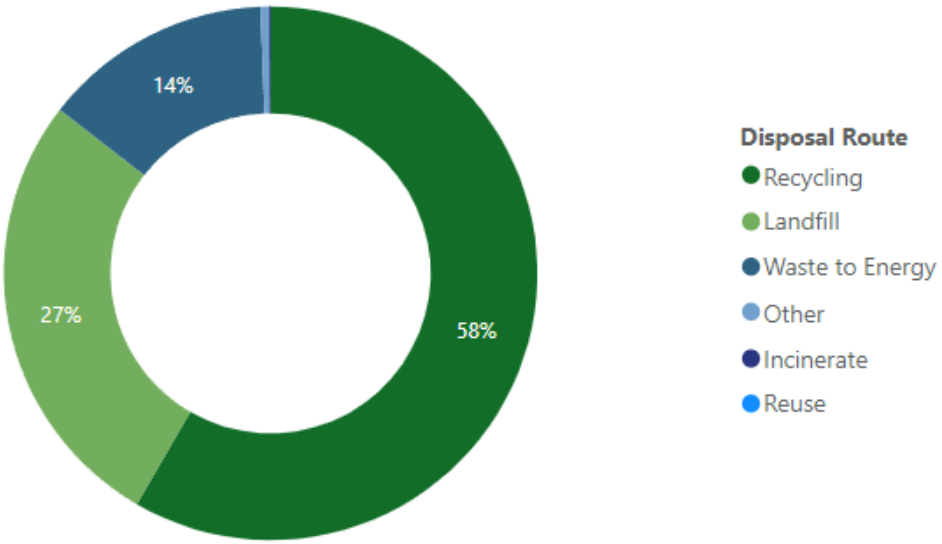


Table 3 - 2023 Armada Kraken operational waste tonnage by disposal route.

Waste Disposal Route	Sum of 2023
Recycling	116
Landfill	54
Waste to Energy	28
Other	1
Incinerate	0
Reuse	0
Total	**198**