Marine Pollution Contingency Plan

October 2016

Beatrice
Offshore Windfarm Ltd

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Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF0000005
Date:	October 2016

Beatrice Offshore Wind Farm

Marine Pollution Contingency Plan

Pursuant to Marine Licence (Offshore Wind Farm) Condition 3.1.12 and Marine Licence (Offshore Transmission Works) Condition 3.1.12

IN THE EVENT OF A SPILL GO STRAIGHT TO

PART 2: POLLUTION INCIDENT RESPONSE PROCEDURE

Rev	Prepared By	Sign Off	Checked By	Sign Off	Approved By	Sign Off	Date of Issue
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Marine Pollution Contingency Plan Overview

Purpose of the Plan

This Marine Pollution Contingency Plan (MPCP) has been prepared to address the specific requirements of the relevant conditions attached to the Marine Licences issued to Beatrice Offshore Windfarm Limited (BOWL).

The overall aim of the MPCP is to provide guidance to BOWL personnel and contractors on the actions and reporting requirements in the event of a pollution incident originating from offshore operations relating to the Beatrice Offshore Wind Farm and associated Offshore Transmission Works.

All BOWL personnel and contractors should read and understand the principles outlined within the MPCP document.

Scope of the Plan

The MPCP, in accordance with the Marine Licence requirements, outlines procedures to protect project personnel and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to the Beatrice Offshore Wind Farm and associated Offshore Transmission Works.

The MPCP presents the following information and guidelines to aid a response in the event that there is an accidental release of pollutants into the marine environment resulting from BOWL operations:

- A risk assessment of the potential sources and likelihood of a pollution incident;

- Oil spill response procedures and actions;

- Background and supporting information to support the response procedures, including response strategy guidelines.

Structure of the Plan

The MPCP is structured in PARTS and Sections as follows:

Sections 1 to 5 set out the scope and objectives of the MPCP, provide an overview of the Development, set out the process by which this MPCP may be updated from time-to-time and describe roles and responsibilities relevant to the MPCP.

PART 1 – RISK ASSESSMENT

Section 6 provides details on the source, type of hydrocarbons present and an assessment of the risk of hydrocarbon release resulting from BOWL operations.

PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE

Section 7 provides a detailed account of response procedures and actions to be executed in the event of a pollution event.

PART 3 – INFORMATON DIRECTORY

Sections 8 and 9 are an information directory, presenting a series of forms to be completed in the event of a spill.

In the event of a spill, reference should be made to PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE

Plan Audience

The MPCP should be circulated to all BOWL personnel and contractors involved in marine operations associated with the Development.

Plan Locations

Copies of this MPCP are to be held in the following locations:

- BOWL Head Office;
- At the premises of any agent, Key Contractor or Subcontractor acting on behalf of BOWL;
- All site offices dealing with marine operations;
- All vessels involved in Construction and Operation and Maintenance activities;
- The BOWL Marine Coordination Centre at Wick; and
- With the ECoW(s).

Contents

List of Abbreviations and Definitions

Term	Description
ACA	Action Co-ordinating Authority.
ALARP	As Low As Reasonably Practicable.
Application	The Application letters and Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 and Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013.
Audit	Inspection to confirm compliance, and identify and correct non-compliance.
BAOAC	Bonn Agreement Oil Appearance Code.
BONN Agreement	The Bonn Agreement is the mechanism by which nine Governments of the Greater North Sea and its wider approaches, together with the European Union, cooperate in dealing with pollution of the North Sea by oil and other harmful substances.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
Cefas	Centre for Environment, Fisheries and Aquaculture Science.
CGOC	Coastguard Operations Centre.
Consent Conditions	The terms that are imposed on BOWL under the S36 Consent or Marine Licences that must be fulfilled throughout the period that the consent is valid.
Construction	As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004.
CoP	Construction Programme (BOWL Document Reference: LF000005-PLN-138) as required for approval under Condition 10 of the S36 Consent and Condition 3.2.2.3 of the OfTW Marine Licence.
COSHH	Control of Substances Hazardous to Health.
CPSO	Counter Pollution and Salvage Officer.
DECC	Department of Energy and Climate Change.
Development	The Wind Farm and the OfTW.
ECoW	Ecological Clerk of Works as required for approval under Condition 30 of the S36 Consent and Condition 3.2.2.12 of the OfTW Marine Licence.
EEZ	Exclusive Economic Zone.
EMP	The Environmental Management Plan as required for approval under Condition 15 of the S36 Consent and Condition 3.2.1.2 of the OfTW Marine Licence.

Term	Description
ERCoP	The Emergency Response Co-operation Plan as required as part of the NSP.
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above.
HSE	Health and Safety Executive.
IFO	Intermediate Fuel Oil
IMDG Code	International Maritime Dangerous Goods Code.
IMO	International Maritime Organisation.
IR	Infra-red.
ITOPF	International Tanker Owners Pollution Federation Ltd.
JNCC	Joint Nature Conservation Committee.
Key Contractors	The Contractors appointed for the individual work packages of Marine Installation; Transmission; and WTGs.
km	Kilometre.
Licencing Authority	The Scottish Ministers.
Licensee	Beatrice Offshore Windfarm Limited, a company registered in Scotland having its registered number as SC350248.
m	Metre
Marine Licences	The written consents granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010 and Section 65 of the Marine and Coastal Access Act 2009, dated 2 September 2014.
MAIB	Marine Accident Investigation Branch.
MCA	Maritime and Coastguard Agency.
MCC	Marine Coordination Centre.
MHWS	Mean High Water Springs.
MMO	Marine Management Organisation.
MORL	Moray Offshore Renewables Ltd.
mPa	Millipascal.
MPCP	The Marine Pollution Contingency Plan as required for approval under Condition 3.1.12 of the Wind Farm/OfTW Marine Licences.
MRCC	Maritime Rescue Co-ordination Centre.
MS-LOT	Marine Scotland Licensing and Operations Team.
MW	Megawatt.
NCP	National Contingency Plan.

Term	Description
NM	Nautical Miles.
NSP	The Navigational Safety Plan (BOWL Document Reference: LF000005-PLN-128) as required for approval under Condition 18 of the S36S36 consent and Condition 3.2.2.9 of the OfTW Marine Licence.
O&M	Operation and Maintenance.
OCM	Offshore COSHH Method.
OCNS	Offshore Chemical Notification Scheme.
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the MHWS at the landfall west of Portgordon on the Moray coast.
OnTW	The onshore transmission works from landfall, consisting of onshore buried export cables to the onshore substation and connection to the National Grid network.
On-site	The area within the boundaries of the Wind Farm and OfTW as defined within the Section 36 Consent and the Marine Licences.
OPEP	Oil Pollution Emergency Plan.
OSCP	Oil Spill Contingency Plan.
OTM	Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
POLREP	Marine Pollution Report.
Primary Responder	The person(s) who will assume primacy in the event of a marine pollution incident and manage initial response.
RNLI	Royal National Lifeboat Association.
RSPB	Royal Society for the Protection of Birds, Scotland.
S36 Consent	The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014.
SEG	Standing Environment Group
SEIS	The Supplementary Environmental Information Statement submitted to the Scottish Ministers by the Company on 29 May 2013 as part of the Application as defined above.
SEPA	Scottish Environment Protection Agency.
SG	Specific Gravity.
SHE	Safety, Health and Environment.
SLAR	Side Looking Airborne Radar.
SNH	Scottish Natural Heritage.

Term	Description
SOPEP	Shipboard Oil Pollution Emergency Plan.
SOSREP	Secretary of State's Representative.
SSE	SSE plc.
Subcontractor	Subcontractors to the Key Contractors.
UKCS	United Kingdom Continental Shelf.
UKPCZ	United Kingdom Pollution Control Zone.
UV	Ultra-Violet.
VHF	Very High Frequency.
Wind Farm	The offshore array development as assessed in the ES including wind turbines, their foundations, inter-array cabling and meteorological masts.
WTG	Wind Turbine Generator.

1 Introduction

1.1 Background

1.1.1 The Beatrice Offshore Wind Farm received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 19 March 2014 (the S36 Consent) and was granted two Marine Licences from the Scottish Ministers, for the Wind Farm and associated Offshore Transmission Works (OfTW), on 2 September 2014 (the Marine Licences) and subsequently superseded on 27th April 2016 (reference: [04461/16/0] / [04462/16/0]). The Wind Farm and the OfTW are jointly referred to as the 'Development'.

1.2 Objectives of this Document

1.2.1 The S36 Consent and Marine Licences contain a variety of conditions that must be discharged through approval by the Scottish Ministers prior to the commencement of any offshore construction works.

1.2.2 One such requirement is the approval of a Marine Pollution Contingency Plan (MPCP), the purpose of which is to provide guidance to Beatrice Offshore Windfarm Ltd (BOWL) personnel and contractors on the actions and reporting requirements in the event of a spill originating from offshore operations relating to the Development. The MPCP covers all marine operations relating to the Development.

1.2.3 The relevant conditions setting out the requirement for an MPCP for approval, and which are to be discharged by this MPCP, are set out in full in Table 1.1.

Table 1.1 –Consent conditions to be discharged by this MPCP

Ref.	Summary of Condition	Where Addressed
Wind Farm and OfTW Marine Licence Condition 3.1.12	**Marine Pollution Contingency Plan** "The Licensee must, no later than 3 months prior to the Commencement of the Works, submit in writing to the Licensing Authority for their written approval, a MPCP.	This document sets out the MPCP for approval by Scottish Ministers.
	The MPCP must make provision in respect of spills and collision incidents occurring during the construction and operation of the Works and where such spills or collisions occur then the MPCP must be adhered to in full. The MPCP must take into account existing plans for all operations, including offshore installations that may have an influence on the MPCP.	PART 1 – RISK ASSESSMENT, Section 6.2 PART 2 – RESPONSE PROCEDURE
	Practices used to refuel vessels at sea must conform to industry standards and to relevant legislation. The MPCP must set out how any oil leaks within the [WTGs/structures] are to be remedied and that such relevant repairs are required to be undertaken without undue delay.	PART 1 – RISK ASSESSMENT, Section 6.2
	Commencement of the Works must not occur until the Licensing Authority has given its written approval to the MPCP. The Works must be constructed and operated in accordance with the MPCP".	This document sets out the MPCP for approval by Scottish Ministers. Section 4 (BOWL Statements of

Ref.	Summary of Condition	Where Addressed
		Compliance).

1.2.4 In addition to the specific consent requirements for an MPCP and the requirements thereof (as set out in Table 1.1), this MPCP also includes information in respect of a number of other conditions within the Project consents which are linked to the matter of pollution control; these are set out in Table 1.2. Reference to where matters are addressed in this MPCP are given.

Table 1.1 - Other consent conditions relevant to this MPCP

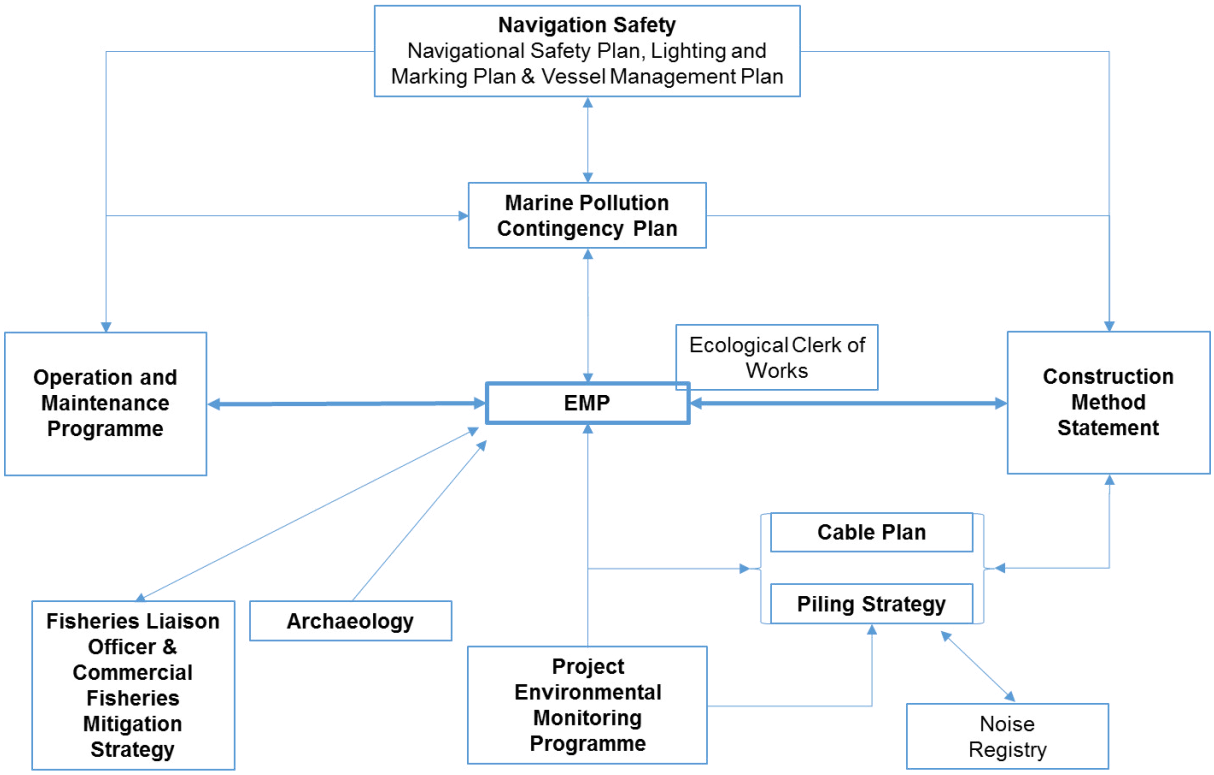
Ref.	Summary of Condition	Where Addressed
Section 36 Consent Condition 15b and OfTW Marine Licence condition 3.2.1.2(b)	**Environmental Management Plan** The Environmental Management Plan (EMP) must address "pollution prevention measures and contingency plans".	The approved EMP summarises the key content of, and makes cross-reference to, this MPCP.
Wind Farm/OfTW Marine Licence 3.1.7	**Chemical usage** "The Licensee must ensure that all chemicals which are to be utilised in the Works have been approved in writing by the Licensing Authority prior to use. All chemicals utilised in the Works must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002, unless approved in writing by the Licensing Authority".	PART 1 – RISK ASSESSMENT, Section 6.2
Wind Farm/OfTW Marine Licence Condition 3.1.8	**Environmental Protection** "…The Licensee must ensure that all substances and objects deposited during the execution of the Works are inert (or appropriately coated or protected so as to be rendered inert) and do not contain toxic elements which may be harmful to the marine environment, the living resources which it supports or human health…".	PART 1 – RISK ASSESSMENT, Section 6.2
Wind Farm Marine Licence Condition 3.2.2.7 OfTW Marine Licence 3.2.1.6	**Bunding and storage facilities** "The Licensee must ensure suitable bunding and storage facilities are employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment".	PART 1 – RISK ASSESSMENT, Section 6.2

1.3 Linkages with other Consent Plans

1.3.1 This MPCP document sets out, for approval, the proposed marine pollution response framework to be applied during the construction and operation of the Development in the event of a marine pollution incident Ultimately it will form part of a suite of approved documents that will provide the framework for the construction process – namely the other Consent Plans required under the S36 Consent and Marine Licences. Figure 1.1 displays the links between this MPCP and other Consent Plans.

1.3.2 The Environmental Management Plan (EMP) provides an overview of BOWL's commitments to pollution prevention and contingency planning and chemical usage. The MPCP presents in detail the response procedures to be followed in the event of a marine pollution incident.

Figure 1.1 - Linkages between the MPCP and other Consent Plans



1.4 Structure of this MPCP

1.1.2 In response to the specific requirements of the Wind Farm and OfTW Marine Licence conditions, this MPCP has been structured so as to be clear that each part of the specific requirements have been met and that the relevant information to allow the Licensing Authority to approve the MPCP has been provided.

1.1.3 The MPCP is required to serve as an operational document that clearly sets out the actions to be taken in the event of a pollution incident. For this reason, the document has been divided into a number of parts, with Part 2 setting out response procedures and other parts of the document providing supporting information. The document structure is set out in Table 1.4.

Table 1.4 – MPCP document structure

Section		Summary of Content
1	Introduction	Background to consent requirements and overview of the MPCP scope and structure; and Identifies those other Consent Plans relevant to the environmental management process and the linkage between those plans and the MPCP.
2	BOWL Statements of Compliance	Sets out the BOWL statements of compliance in relation to the MPCP consent conditions and other requirements.
3	Development Overview	Provides an overview of the Development and an overview of the timing of the offshore construction works.
4	Updates and Amendments to this MPCP	Sets out the process for making updates and amendments to the MPCP.
5	MPCP Roles and Responsibilities	Describes roles and responsibilities relevant to the delivery of the MPCP.
PART 1 – RISK ASSESSMENT		
6	Sources of Pollution and Risk Assessment	Provides a list of the potential sources of pollution, the level of risk and steps taken to mitigate against a potential pollution event.
PART 2 – RESPONSE PROCEDURE		
7	Pollution Response Procedures	Specific pollution response procedures and roles of key personnel including detailed reporting procedures in the event of a pollution incident.
PART 3 – INFORMATION DIRECTORY		
8	Incident Response Forms	Reporting forms to be used in the event of a pollution incident.
Appendices		
A	MPCP Legislation Register	A register of legislation relevant to pollution control.
B	Legal Framework and Government Responsibilities	Legislation, guidance and role of government agencies and representatives relating to spill response procedures.

Section		Summary of Content
C	Response Strategy Guidance	Guidance documents presenting the role of oil spill response techniques and efficacy during deployment.
D	Contacts Directory	Provides a template to be populated with contact details for those individuals and organisations with pollution reporting and response responsibilities.

2 Statements of Compliance

2.1 Introduction

2.1.1 The following sections are intended to re-affirm the overarching BOWL commitments relating to marine pollution response during construction and operation of the Development in such a manner as to meet the relevant requirements set out by the Project consents but also broader legislative requirements. Specifically it sets out:

- A number of statements of compliance relating to this MPCP and the broader requirements of the Project consents;
- Overarching matters related to Safety, Health and Environmental (SHE) management;
- Matters related to personnel;
- Matters related to vessels;
- Matters related to environmental mitigation;
- Matters related to good working practices; and
- Legislative requirements.

2.2 Statements of Compliance

2.2.1 BOWL in undertaking the construction and operation of the Development will require that this MPCP is circulated to all relevant personnel and, in the event of a marine pollution event, is complied with in accordance with the procedures outlined and as approved by the Scottish Ministers (and as updated or amended from time to time following the procedure set out in Section 4 of this MPCP).

2.2.2 Where updates or amendments are required to this MPCP, BOWL will require that the Scottish Ministers are informed as soon as reasonably practicable and where necessary the MPCP will be updated or amended (see Section 4).

2.2.3 BOWL in undertaking the construction and operation of the Development will require compliance with other, relevant Consent Plans as approved by the Scottish Ministers including, as set out in Section 1.3 above.

2.2.4 BOWL will require that all relevant personnel, Key Contractors and Subcontractors implement this MPCP throughout the construction and operation and maintenance phase of the Development. This will be required by conditions of contracts with Key Contractors and Subcontractors.

2.3 SHE Management

2.3.1 BOWL are committed to undertaking the construction and operation of the Development in a way that minimises the risks to safety, health and the environment.

2.3.2 BOWL will require that all Key Contractors and Subcontractors have completed audited Risk Assessments for all health, safety and environmental risks associated with construction and operational activities, and that adequate control measures and actions are in place to reduce the impact of such activities to as low as reasonably practicable. Note in this regard that BOWL has developed an ALARP Design Procedure to provide sufficient information and guidance on the process, activities and documentation required to effectively and demonstrably manage the Significant Accident Hazard (SAH) risks associated with the design, to a level that is as low as reasonably practicable (ALARP).

2.3.3 BOWL will require that such Risk Assessments are carried out and consider all foreseeable environmental impacts that could occur on the Development as a result of construction, installation, commissioning and other marine and operational activities.

2.3.4 BOWL will require that safe systems of work are developed that detail the control measures taken to either eliminate environmental hazards or effectively control them.

2.3.5 The BOWL company SHE standards and risk management procedures will be required to be applied in completing the construction and operation of the Development and will be required to be applied as minimum standards through conditions of contract with the Key Contractors and Subcontractors.

2.4 Personnel – Training and Competence

2.4.1 BOWL will require that all personnel engaged in the construction and operational phases have adequate skills, qualifications and experience to perform the activities executed under their responsibility or in their scope in a safe manner for themselves and others and are adequately supported at all levels.

2.4.2 BOWL will require that all Key Contractors and Subcontractors have sufficient manpower resources of the required competence to meet the contractual requirements. Safe manning levels for all onshore and offshore activities will be determined by industry guidance and past experience.

2.4.3 BOWL will require that all construction and operational personnel are appropriately qualified and attend, as required, project inductions including, but not necessarily limited to, matters related to Site Rules, Health and Safety requirements, arrangements for First Aid and Emergency Response, Environmental Management and Incident Management.

2.5 Construction and Operational Vessels

2.5.1 BOWL will require that all construction and operational vessels meet the relevant, required, recognised standards and will comply with the relevant international maritime rules (as adopted by the relevant flag state) and regulations.

2.5.2 BOWL will conduct independent vessel audits on construction and operational vessels as necessary to check that they meet these standards and are appropriate for the purpose of their prescribed roles.

2.5.3 BOWL will require that all construction and operational vessels will comply with the procedures and requirements set out in relevant Consent Plans such as this MPCP, the EMP, the Navigational Safety Plan (NSP) and the Vessel Management Plan (VMP).

2.6 Good Working Practices

2.6.1 BOWL will require that good working practice is applied by the Key Contractors and Subcontractors throughout the construction process and subsequently during the operational phase, in seeking to minimise the risks to personnel, other sea users and the environment.

2.6.2 Good working practices that will be applied during the Development are set out primarily in the Construction Method Statements (CMS), and in the Operation and Maintenance Programmes (OMP).

2.7 Legislative Requirements

2.7.1 BOWL will, in undertaking the construction and operation of the Development, require compliance with all relevant legislation and that all necessary licences and permissions are obtained by the Key Contractors and Subcontractors, through conditions of contract and by an appropriate auditing process.

2.7.2 BOWL will comply - and require that all contractors comply - with the requirements of relevant environmental and maritime legislation as standard. A register of legislation relevant to marine pollution contingency planning is presented in Appendix A.

3 Development Overview

3.1 Overview

3.1.1 Figure 3.1 shows the location of the Development in the Moray Firth. The Development will consist of the following main components:

- A total generating capacity of up to 588MW;
- Up to 84 wind turbines of 7MW rated generating capacity;
- Jacket substructures each installed on four pile foundations driven into the seabed;
- Two AC 220 / 22 kV substation platforms, referred to as offshore transformer modules (OTMs) to collect the generated electricity and transform the electricity from 33kV to 220kV for transmission to shore;
- A network of circa 140km of inter-array cables, buried or (if burying is not possible) mechanically protected, subsea cables to connect strings of turbines together and to connect the turbines to the OTMs;
- Two buried or mechanically protected, subsea Export Cables, totalling circa 140km in length, to transmit the electricity from the two OTMs to the landfall at Portgordon and connect to the two onshore buried Export Cables for transmission at the transition joint pit. The onshore Export Cables further transmit the electricity to the BOWL onshore substation at Blackhillock. After which further 400 kV cabling connect the BOWL substation to the National Grid network via the neighbouring Scottish Hydro Electric Blackhillock substation;
- One OTM Interconnector Cable of circa 1.2km in length that links the OTMs to one another; and
- Minor ancillary works such as the deployment of met buoys and permanent navigational marks as defined in the Lighting and Marking Plan (LMP) (Ref: LF000005-PLN-136).

3.1.2 The Development is located approximately 13.5 km offshore from its nearest point to the east Caithness coastline in the Moray Firth (Figure 3.1).

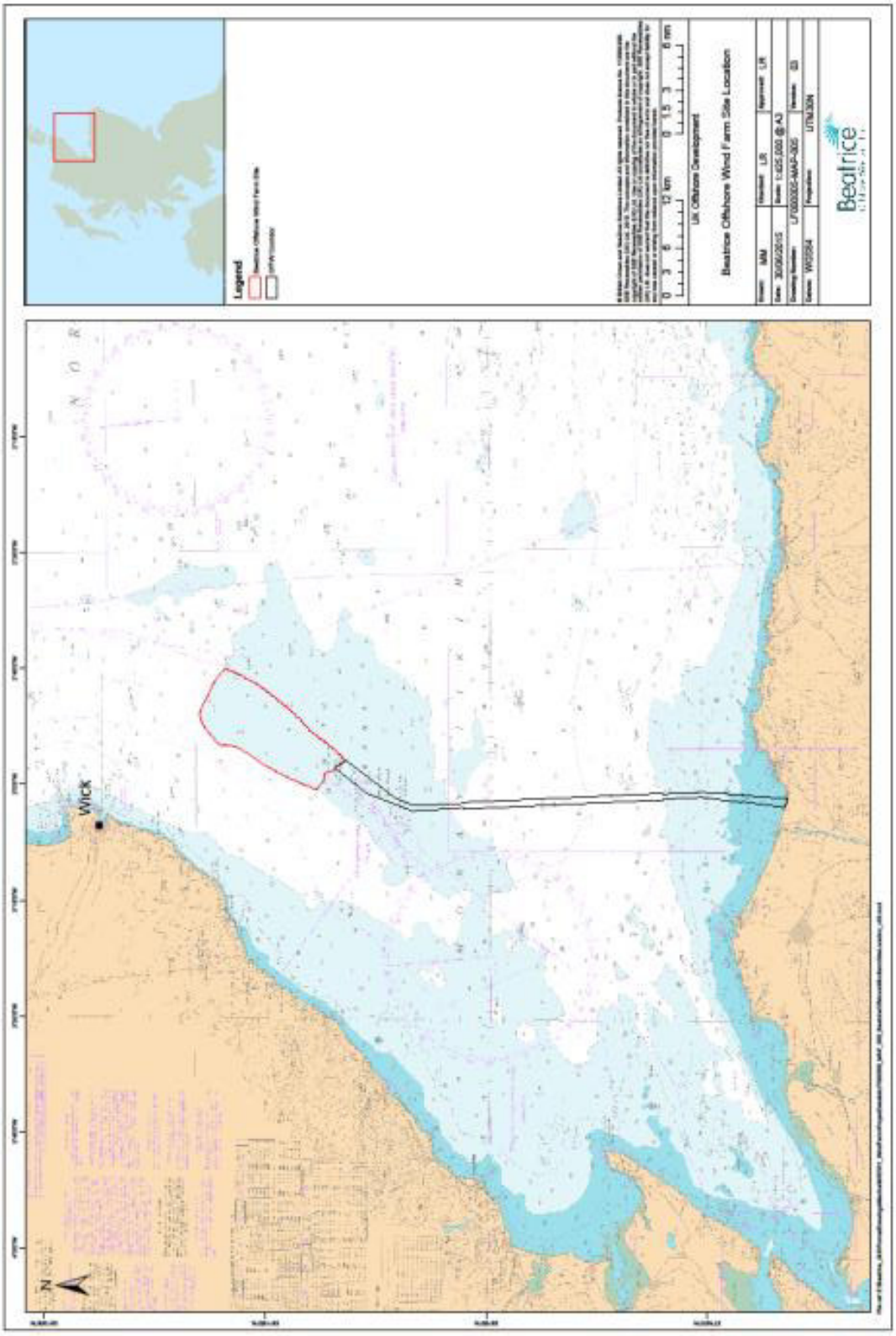


Figure 3.1 - Beatrice Wind Farm and OfTW general location map

3.2 Timing of the Offshore Construction Works

3.2.1 Details of the construction programme are provided in the approved Construction Programme (CoP) (required under Condition 10 of the S36 Consent and Condition 3.2.2.3 of the OfTW Marine Licence). It is currently anticipated that the offshore construction works will be carried out around the clock (i.e. 24 hour working 7 days a week unless noted otherwise).

4 Updates and Amendments to this MPCP

4.1.1 This MPCP sets out the pollution response measures to be applied throughout the Development.

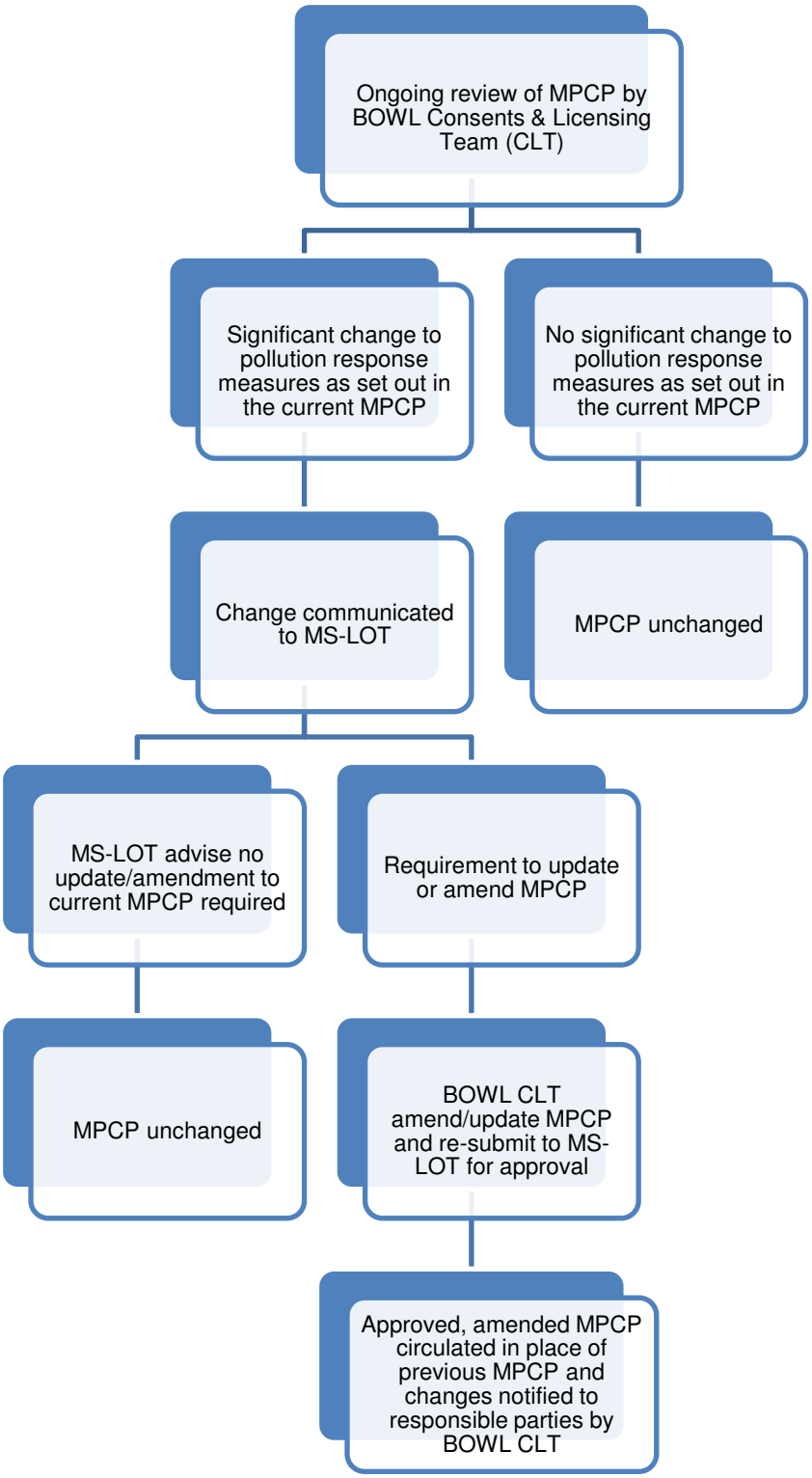
4.1.2 Where it is necessary to update this MPCP in light of any significant new information related to pollution response, BOWL propose to use the change management process set out in Figure 4.1 in identifying such information, communicating such change to the Scottish Ministers, re-drafting the MPCP, seeking further approval for the necessary amendments or updates and disseminating the approved changes/amendments to responsible parties.

4.1.3 In the event of any oil or chemical spill to the marine environment, no matter how small, an internal meeting will be held following the close out of the incident to review lessons learned, with the MPCP and associated procedures updated as required.

4.1.4 Whilst this MPCP contains information relating to the operation of the Development, following the completion of construction, the MPCP will be reviewed and, if necessary, tailored to the Operation and Maintenance (O&M) phase.

4.1.5 BOWL will maintain a current, periodically reviewed and updated directory of contact details for those individuals and organisations with responsibilities for implementing this MPCP. The MPCP Contacts Directory (see Appendix D for template) will sit alongside this MPCP document and be re-issued to all responsible parties following any update.

Figure 4.1 – MPCP Change Management Procedure



5 MPCP Roles and Responsibilities

5.1.1 BOWL and BOWL's contractors are responsible for:

- Developing, maintaining and communicating their own MPCPs or equivalent spill plans consistent with this MPCP;
- Managing an ongoing spill response;
- Liaising and co-operating with statutory bodies in the event of a spill.

5.1.2 The responsibilities of those with specific marine pollution prevention and response roles are set out below.

5.2 BOWL

5.2.1 BOWL recognises that as the Licence Holder, it is responsible for ensuring adequate resources and procedures are in place and available to ensure that any oil or chemical spill originating from the Development during its lifetime is adequately dealt with. BOWL will require that all Key Contractors and Subcontractors, through conditions of contract, make appropriate provisions commensurate with the level of risk associated with their activities to respond to any oil or chemical spills during Construction or Operation of the Development.

BOWL Senior Project Manager

5.2.2 The BOWL Senior Project Manager will be responsible for requiring that sufficient resources and processes are in place to deliver/comply with the MPCP.

5.2.3 BOWL's Senior Project Manager will require that all Key Contractors are familiar with reporting and response procedures outlined within the MPCP and that adequate provision is made to respond appropriately in the event of an incident.

5.2.4 The BOWL Senior Project Manager will be responsible for reporting on any marine pollution incident to the SSE senior management and the BOWL Board, and for addressing Key Contractor and Subcontractor non-compliance.

BOWL SHE Manager

5.2.5 The BOWL SHE Manager is responsible for providing support, advice and guidance on all aspects of Safety, Health & Environmental management on the Development.

5.2.6 In relation to this MPCP the SHE Manager will provide SHE support, advice and guidance to the BOWL Project team and ensure that all construction personnel are familiar with SHE requirements. The SHE Manager will review contractor pollution response documents and arrangements to ensure they are fit-for-purpose. The SHE Manager will conduct auditing in relation to the MPCP provisions. In the event of a spill the BOWL SHE Manager will provide advice to the Primary Responder as required.

BOWL Consents and Licensing Team

5.2.7 BOWL Consents and Licensing Team (CLT) will be supporting the BOWL Construction Team in the ongoing compliance with consent conditions including this MPCP. BOWL CLT will be supported by the ECoW.

BOWL Ecological Clerk of Works

5.2.8 The ECoW will review contractor pollution response documents and arrangements to ensure compliance with this MPCP. The ECoW will provide advice to the Primary Responder as required in relation to potential environmental risk arising from oil or chemical spills.

5.2.9 In the event of a pollution incident, the ECoW will receive a log of all actions taken and notifications issued during response. They will also provide support to the Primary Responder, as required, in determining an appropriate response strategy. On the closure of an incident, the ECoW will be part of the lessons-learnt exercise and may assist the BOWL Construction Team on any required updates to the MPCP in the context of the BOWL Consents.

5.2.10 Where a pollution incident requires a Tier 2 or Tier 3 response (see PART 1, Section 6.2 for Tier definition) the ECoW will be available to engage with the MCA and established response cells (see details on the National Contingency Plan below, Section 5.6) including the Standing Environment Group (SEG) to provide project specific environmental information to feed into the response strategy.

5.2.11 Throughout the duration of any incident the ECoW will also maintain a record of any observed mortality or other effects on marine biota (such as marine mammals, birds and fish) as may be reported to them. These incidental records will be provided to relevant response cells, including the SEG and will, where appropriate, be considered in the formulation of a response strategy. The incidental records of marine wildlife observations will be provided to MS-LOT as part of the wider reporting strategy (as set out in the EMP).

5.2.12 Further details on the specific responsibilities of the ECoW during a marine pollution incident are set out under PART 2, Sections 7.2 and 7.3; more generally the role of the ECoW is set out in the EMP.

5.3 Marine Coordinator

5.3.1 A project Marine Coordination Centre (MCC) will be established at Wick Harbour from where Construction and Operation and Maintenance (O&M) activities will be coordinated.

5.3.2 A Marine Coordinator and their support team will be based at the MCC. In addition to coordinating day-to-day vessel activity in the Development Area, the Marine Coordinator will be the main BOWL point of contact in the event of emergency and pollution incidents. In the event of a pollution incident originating from a vessel or vessel related activity, the Marine Coordinator will assist with the coordination and execution of the ongoing response maintaining close communication with the Primary Responder and liaising with statutory authorities if required. Where a spill is from a BOWL installation the Marine Coordinator will manage the spill response and coordinate any clean-up operations.

5.3.3 Further detail on the specific responsibilities of the Marine Coordinator during a marine pollution incident are set out under PART 2, Sections 7.2 and 7.3.

5.4 Construction and Maintenance Contractors

5.4.1 Offshore construction and O&M work will be primarily conducted by contractors. BOWL will require that all Key Contractors and Subcontractors are familiar with this MPCP. Key Contractors and Subcontractors will ensure that contractor Shipboard Oil Pollution Contingency Plans or equivalent contractor-specific plans are compliant with the approved MPCP.

5.4.2 Contractors are expected to prepare and implement their own MPCPs or bridging document, specific to the works that they are responsible for, which are to be compliant with the content of this document. Contractor-specific MPCPs or bridging documents should clearly interface with existing Ship-board Oil Pollution Contingency Plans (SOPEPs) or equivalent vessel-specific spill plans (for spills that originate from a vessel, or from operations taking place on a vessel related to the activity that they are contracted to carry out).

5.4.3 In the event of a spill from a vessel or from operations taking place on a vessel or from an installation where BOWL have not yet taken ownership, the Key Contractor will assume primacy of the incident and be responsible for implementing an immediate response in accordance with their own SOPEP (or other relevant spill plan), which will be consistent with the requirements of this MPCP, and for informing BOWL of their actions.

5.4.4 The specific responsibilities of contractors including vessel masters during a marine pollution incident are set out under PART 2, Section 7.2 and 7.3.

MPCP Training

5.4.5 All personnel likely to be involved in a marine pollution incident have to meet specific training requirements and standards.

5.4.6 Those individuals with MPCP responsibilities will be required by BOWL to have received or to undergo training appropriate to their role in spill response.

5.4.7 Additionally, BOWL will require that all project personnel involved in construction and O&M activities participate in inductions and subsequent toolbox talks that will brief individuals on the content of the BOWL MPCP and confirm their role in pollution response.

5.4.8 BOWL will establish a programme of ongoing exercises for maintained proficiency and continual improvement in spill response. This programme may include hands-on equipment deployments, and incident management and notification exercises.

5.5 Oil Spill Response Contractor

5.5.1 BOWL will require that Key Contractors engage an oil spill response contractor prior to construction commencing.

5.5.2 Oil spill response contractors should be capable of providing response capabilities commensurate with the potential worst case scenario associated with their scope of works.

5.5.3 During the O&M phase, an oil spill response organisation will be contracted dependent upon the offshore operations being undertaken.

5.6 Interfacing Oil Pollution Contingency Plans and Organisations

5.6.1 The Wind Farm and OfTW and Marine Licence Condition 3.2.12 requires that:

The MPCP must take into account existing plans for all operations, including offshore installations that may have an influence on the MPCP.

5.6.2 The following sections set out how BOWL's MPCP will interface with existing oil pollution contingency plans.

5.6.3 Within the UK there is an adopted structure and procedure for response to marine pollution events, which clearly defines the roles and responsibilities of industry, the UK Government and Local Authorities. Further information on the jurisdiction and roles of statutory bodies and industry in the event of a spill is provided in Appendix B.

5.6.4 In the event of a spill originating from Development activity, the Marine Coordinator will ensure that other operators and/or vessels in the vicinity that may be impacted, are notified. Where a spill originating from the Development drifts towards and/or reaches neighbouring installations and/or vessels, this may instigate activation of

their own pollution contingency plans. Where appropriate BOWL will work to implement a co-ordinated response and share pollution response resources.

5.6.5 Other pollution contingency plans, which may interact with this MPCP in the event of a spill originating from the Development, are identified below.

Industry Plans

5.6.6 This MPCP interfaces with the following industry standard plans:

- SOPEPs/equivalent vessel-specific spill plan for each vessel;
- Port and Harbour Oil Spill Contingency Plans (OSCPs); and
- Oil Pollution Emergency Plans (OPEPs) for oil installations.

5.6.7 Other installations and operators must be notified in the event of a spill.

5.6.8 Other installations in the vicinity of the BOWL Development include the Beatrice Oil Field (owned and operated by Talisman Energy) and Jacky oil platforms (owned and operated by Ithaca Energy). The Beatrice offshore oil field facilities include the main complex at Beatrice Alpha, which comprises a drilling and accommodation platform linked to a production platform, and unmanned satellite platforms at Beatrice Bravo and Beatrice Charlie. The Jacky Field is produced via an unmanned platform linked to Beatrice Alpha. Beatrice and Jacky Field installations are covered by existing OPEPs.

5.6.9 Additionally, Moray Offshore Renewables Ltd (MORL) has consent to construct and operate the Telford, Stevenson and MacColl offshore wind farms in the Outer Moray Firth. Should these wind farms be constructed, they will have their own MPCP(s).

5.6.10 The Marine Coordination Centre will be located at the Port of Wick and will be the base for a number of crew transfer vessels during construction and O&M phases of the BOWL Development. The Port of Wick has an OSCP to cover incidents within the port and harbour. The Port's OSCP would take priority over the BOWL MPCP in the event of a major spill in the harbour and port, in terms of response to an incident.

5.6.11 In addition, Nigg Energy Park has been identified as a construction laydown port to marshal the wind turbine components and to load the wind turbines onto the installation vessel. Invergordon will be utilised for deep berthing and grout loading during foundation installation. Ports utilised during Construction and O&M will have their own OSCP to cover incidents within the port and harbour. The Port's OSCP would take priority over the BOWL MPCP in the event of a major spill in the harbour and port, in terms of response to an incident.

5.6.12 Other ports may be used by a variety of construction vessels within the Moray Firth, along the east coast of Scotland and further afield in Europe. Similarly each of these ports would be expected to have its own OSCP to cover incidents within the port and harbour. The Port's OSCP would take priority over the BOWL MPCP in the event of

a major spill in the harbour and port, in terms of response to an incident.

5.6.13 Assuming pollution from an unidentifiable source is drifting towards the wind farm, BOWL shall comply fully with any instructions from the MCA or other relevant authority in order to facilitate an appropriate pollution response. This may include shut-down of the wind farm to allow mechanical recovery of the pollution or dispersant application. In addition the spill observer will escalate the reporting procedures and initial response actions as detailed within Section 7.2. As soon as the source has been identified, the relevant installation/operator will be notified and BOWL and/or their Key Contractors will continue to provide a supporting role.

Local Authority Plans

5.6.14 In the event of actual or threatened shoreline impact, the oil spill contingency plan administered by the relevant local authority (e.g. Moray, Highland, and Aberdeenshire) will be implemented.

National Contingency Plan

5.6.15 In the event of a significant oil spill incident, which calls for a Tier 2 or Tier 3 response (see PART 1, Section 6.2 for Tier definition), the MCA may decide to implement the National Contingency Plan (NCP). In such an event, the MCA will take control of at-sea counter pollution measures and establish a Marine Response Centre (MRC). Should there be a formal hand-over of responsibility to MCA for dealing with the incident, the Key Contractor's oil spill response resources and facilities will be made available to the MCA.

5.6.16 In the event that the NCP is implemented then the Secretary of State's Representative (SOSREP) will assume full command of the spill response operation. The role of the SOSREP is to represent the Secretaries of State for Transport and Department of Business, Energy and Industrial Strategy by removing or reducing the risk to persons, property and the UK environment arising from accidents involving ships, fixed or floating platforms or sub-sea infrastructure within UK waters, within the remainder of the Exclusive Economic Zone (EEZ)/UK Pollution Control Zone (UK PCZ) and on the UK Continental Shelf.

5.6.17 The powers of intervention with which SOSREP is invested provide that the SOSREP can direct a person to take, or refrain from taking, any action of any kind whatsoever. Indeed, if SOSREP is not convinced that the person directed can, or will, take the action then he may cause the action to be taken himself - even if this includes the total destruction of a vessel. The legislation also creates criminal offences for non-compliance with a Direction. It should be noted that Directions must be given to specified persons who are those being in charge of a vessel or a port or harbour authority. The SOSREP has the decisive voice in the decision making process in a marine salvage operation that involves the threat of significant pollution. The Director

/ Deputy Director of Operations will act as a stand-in in the event of SOSREP being unavailable.

5.6.18 Once notified the Counter Pollution and Salvage (CPS) Branch of the MCA will determine the need to establish a MRC. The MRC will consider and implement the most appropriate means to contain, disperse and remove pollutants from the scene in the event of a national (Tier 3 and possible Tier 2) incident. The SOSREP will also determine the need for a Salvage Control Unit (SCU) to monitor salvage activity and ensure that actions being taken do not have an adverse effect on safety and the environment and the need for an Operations Control Unit (OCU) to monitor response actions.

5.6.19 The MCA will determine whether it is necessary to convene the Scottish Standing Environment Group (SEG) to provide advice on public health and environmental issues that require a regional or national response. The scope of the SEG functions will be directly proportional to the scale and nature of the incident, its geographical location, extent, severity, pollutant involved, potential hazard to human health and environmental sensitivities. The scale of the incident and response and their constituent phases are likely to evolve over time and the functions of the SEG will need to be graduated to meet changing requirements, escalating or diminishing in the input to each phase over time (MCA STOp notice 2/15).

5.6.20 The core members that will comprise the SEG will include representatives from Marine Scotland, who will chair the group, Scottish Environment Protection Agency (SEPA), Joint Nature Conservation Committee (JNCC), Scottish Natural Heritage (SNH) and NHS Scotland.

5.6.21 Additional groups may be established where pollution threatens the coastline including the Strategic Coordinating Group (STC) to manage the onshore response strategy and the Tactical Coordinating Group (TCG) to develop an onshore operational response plan. A Scientific and Technical Advisory Group (STAC) may be established to provide advice to the STC and TCG. The STAC will execute a similar function as the SEG. The STAC will work closely with the SEG and in some circumstances may merge fully to provide consistent advice in the event of a Tier 2 or 3 incident.

PART 1 – RISK ASSESSMENT

6 Pollution Sources and Risk Assessment

6.1 Introduction

6.1.1 This section identifies the type and size of oil and chemical spill that the BOWL spill response arrangements will need to be able to address. It looks at the potential sources and likelihood of spills that could occur from typical operations, gives an overview of the potential 'operational' and 'worst case' scenarios, and the prevention and control measures proposed by BOWL to minimise or eliminate spill risks.

6.1.2 The severity of effects from a spill are dependent on a wide range of factors, including:

- The volume of oil or chemical spilled;
- The physical and chemical nature of the product;
- The location of the spill and proximity of shoreline or other sensitivities;
- The weather and sea state conditions during and following the spill; and
- Hydrographic conditions.

6.1.3 Given this variety of factors, accurate predictions of impacts before a spill are difficult to make. Rapid access to information on the environmental conditions and features is essential in spill response.

6.1.4 For offshore operations, oil spills often pose the most serious environmental risk. Chemical spills, although they can have localised highly toxic effects and pose particular risk to personnel, are generally lower risk, as inventories of stored chemicals are often much smaller in volume than those of hydrocarbons. In addition, chemicals commonly exhibit solubility in water and hence are diluted rapidly on contact with the sea in the event of a spill. Oil and other liquid hydrocarbons exhibit no such solubility on contact with water – the majority initially float on the water's surface, though may over time sink beneath the surface, and can persist in the marine environment for long periods of time, depending on the type of hydrocarbon released. For these reasons, hydrocarbon spills are considered in more detail in the below sections.

6.2 Spill Scenarios, Prevention and Control Measures

6.2.1 Potential spill scenarios are dictated by the hydrocarbon and chemical inventories on the vessels and offshore installations. In practice, due to precautions such as training, operating procedures and engineered solutions, the majority of the spills that may occur are likely to be small.

6.2.2 A brief risk assessment of potential spill scenarios and proposed mitigation measures to minimise or eliminate the risks has been carried out for the Development (construction and operational phase as appropriate), and is presented in Table 6.1. The risk assessment will be updated (if necessary) to ensure that the worst case spill

scenario is assessed. The risk assessment will also be reviewed and, if necessary, be updated following completion of the construction phase, to ensure that it remains relevant for the operational phase.

6.2.3 For general oil spill response, it is common to divide levels of response into three tiers, according to the severity of the spill and the resources required to combat it. The three tiers are commonly defined as follows (Figure 6.1):

- **Tier 1** response is that which is immediately available on site, geared for the most frequently anticipated oil spill;
- **Tier 2** response is for less frequently anticipated oil spills of larger size and for which external resources on a regional level will be required to assist in monitoring and clean-up; and
- **Tier 3** response is in place for the very rarely anticipated oil spill of major proportions and which will possibly require national and international resources to assist in protecting vulnerable areas and in the clean-up.

Figure 6.1 - The tiered response concept

6.2.4 The conventional view of a Tier 3 scenario is one involving an exceptionally large volume of spilled oil, for example from a major ship-sourced accident, an oil well blowout, or other such rare but highly significant event. However, a Tier 3 response may also be required for more modest volumes, perhaps where Tier 2 arrangements may be largely absent or overwhelmed, highly sensitive areas threatened, or highly-specialised strategies being required that are not available locally.

6.2.5 The BOWL-specific risk assessment in Table 6.1 shows that small operational type spills (e.g., Tier 1 category) are the most likely. However, the risk assessment cannot

predict with certainty the Tier level outcome of any spill, and under a worst case spill scenario, it is possible (although considered highly unlikely) that a Tier 2 or Tier 3 response could be required.

6.2.6 The main source of hydrocarbons associated with the Development will be Marine Gas Oil (MGO) or Intermediate Fuel Oil (IFO) used to fuel construction and O&M vessels. The quantities of MGO and IFO will be limited to the bunkering capabilities of the vessels. The potential worst case spill scenario associated with the Development would be a complete loss of fuel inventory from two large vessels as a result of collision, or where a passing vessel collides with a wind farm vessel or structure.

6.2.7 Once spilled in the marine environment, oil immediately begins to undergo weathering, a term used to describe many natural, physical, chemical and biological changes. The changes that the oil undergoes will often influence the effectiveness of response options. Prevailing meteorological and oceanographic conditions, as well as the type of oil spilled, will determine its ultimate fate.

Table 6.1 - Potential spill scenarios and control measures for the Development

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
Hydrocarbons Intermediate Fuel Oil (IFO) Marine Gas Oil (MGO) (Diesel)	**Vessel refuelling** Loss of fuel during vessel to vessel refuelling at sea or refuelling at port.	BOWL and/or contractors will undertake operationally necessary refuelling at sea as required, to fuel vessels that are extremely restricted in their capability to leave station to take on fuel, such as jack ups. Preparation and review of task-specific risk assessments, method statements and fuel transfer planning tools and checklists. Refuelling of vessels or equipment offshore shall, where practicable, only commence during daylight and in good weather conditions.	**Low**	**Tier 2**
	Equipment refuelling Loss of fuel during refuelling of equipment (on vessel or on turbine/offshore transformer module (OTM)).	Refuelling operations will be planned in advance. Fuel transfer operations will be carefully conducted under the supervision by an appointed responsible person on board (e.g. Chief Engineer) and in accordance with each vessel's stipulated procedure and checklist. A bunker plan shall be developed and posted on the Bridge and in the Machinery Control Room. Before fuel transfer starts a meeting will be held with all ship staff involved in the operation and the following subjects should be discussed, as a minimum: ▪ Bunker plan, including any anticipating changes; ▪ Risk assessment; ▪ Individual roles and responsibilities in the process; ▪ Emergency situations; and ▪ Bunkering Checklists. Only hoses fitted with non-return valves shall be used for the offshore transfer of fuel or other fluids. Vessels over 400 GRT will carry a SOPEP in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. Vessels over 400 GRT will carry an Oil Record Book in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. In the Oil Record Book particulars are entered of: ▪ Details of fuel and oil bunker operations; ▪ Disposal of sludge (oil residues); ▪ Discharge overboard or disposal otherwise of machinery space bilge water; ▪ Condition of oil discharge monitoring and control systems;	**Low**	**Tier 1**

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
		▪ Accidental or other exceptional discharges of oil; and ▪ Additional operational procedures and general remarks. Appropriate training of personnel and supervision of activity. Compliance with conditions related to vessel refuelling set out in Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012". A visual lookout will be made at all times during fuel transfer operations to verify hose integrity throughout the transfer and in order to spot any leaks immediately. All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. Regular inspection and maintenance of equipment. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.		
	Vessel to vessel collision Loss of fuel from collision between two vessels.	All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-128) to prevent vessel to vessel collision and vessel to structure allision.	**Very low**	**Tier 2 (possible but unlikely Tier 3)**
	Vessel to structure allision Loss of fuel from allision between vessel and structure (e.g., wind turbine).		**Very low**	**Tier 2 (possible but unlikely Tier 3)**
	Vessel stranding/grounding	All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-128) to prevent vessel stranding / grounding.	**Very low**	**Tier 2**

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	Loss of fuel due to vessel stranding/grounding.			**(possible but unlikely Tier 3)**
	Failure of plant or equipment Release of fuel due to failure of plant or equipment.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. All plant and equipment shall only be operated by adequately trained and competent personnel. All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	**Low**	**Tier 1**
	Spillage during use of equipment Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	**Low**	**Tier 1**
Lubricating Oil	**Incident** Loss of lubricating oil from collision between two vessels, or allision between vessel and structure, or stranding/grounding of vessel.	All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-128) to prevent vessel to vessel collision, vessel to structure allision and vessel stranding / grounding.	**Very low**	**Tier 2**
	Leakage within WTGs Leakage of lubricating	All equipment shall be operated and maintained in good order and in accordance with legal requirements. The inventory of lubricating gear oil is limited within the turbine nacelle as there is no conventional gear box	**Low**	**Tier 1**

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	gear oil or grease within nacelle.	(direct drive). Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. . Gear oil seals shall be routinely checked during planned maintenance programmes.		
	Leakage within OTMs Leakage of transformers.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. Transformer oil seals shall be routinely checked during planned maintenance programmes.	**Low**	**Tier 1**
	Spillage during use of equipment Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	**Low**	**Tier 1**
	Failure of plant or equipment Release of lubricating oil due to failure of plant or equipment.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. All plant and equipment shall only be operated by adequately trained and competent personnel.	**Low**	**Tier 1**
Hydraulic Oil	**Incident** Loss of hydraulic oil from collision between two vessels, or collision between vessel and structure, or stranding/grounding of vessel.	All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-128) to prevent vessel to vessel collision, vessel to structure allisions and vessel stranding / grounding.	**Very low**	**Tier 1**
	Leakage within WTGs	All equipment shall be operated and maintained in good order and in accordance with legal requirements. The inventory of hydraulic oil is limited within the turbine nacelle as there is no conventional gear box (direct drive).	**Low**	**Tier 1**

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
		Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Oil seals shall be routinely checked during planned maintenance programmes.		
	Failure of plant or equipment Release of hydraulic oil due to failure of plant or equipment, e.g., hydraulic hoses.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. All plant and equipment shall only be operated by adequately trained and competent personnel. All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume.	**Low**	**Tier 1**
	Spillage during use of equipment Small spills during operation.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	**Low**	**Tier 1**
Chemicals	**Incident** Loss of chemical load from vessel collision/allision, or stranding/grounding of vessel.	All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-128) to prevent vessel to vessel collision, vessel to structure allisions and vessel stranding / grounding. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).	**Very low**	**Tier 1**
	Leakage within WTG Leakage of coolant or transformer fluid within nacelle.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Equipment including hoses, pipes and seals shall be routinely checked during planned maintenance programmes. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).	**Low**	**Tier 1**
	Spillage during use	Preparation and review of task-specific risk assessments and method statements.	**Low**	**Tier 1**

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	Spillage of paints, paint thinners, solvents, cleaning fluids etc during use.	Personnel shall be trained in the correct handling and use of chemicals. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. All hazardous substances shall have a safety data sheet (SDS) which is intended to provide procedures for handling or working with that substance in a safe manner. The handling and use of chemicals and hazardous substances shall be in compliance with the information on the SDS. COSHH assessments should be conducted for Development specific hazardous substances. Segregated storage facilities will be used to control the separation of hazardous substances. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).		

6.2.8 The following subheadings provide further detail on control measures outlined in Table 6.1 to reduce residual risk of potential spill incidents occurring.

Vessel to Vessel refuelling

6.2.9 The BOWL Wind Farm and OfTW Marine Licence conditions which specify the requirement for a Marine Pollution Contingency Plan (Condition 3.1.12 of each respective licence) state that:

> *practices used to refuel vessels at sea must conform to industry standards and to relevant legislation.*

6.2.10 The following section includes additional detail to that presented in Table 6.1 above and is provided to clearly address the requirements of the Marine Licence conditions.

6.2.11 Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" (MCA, 2012) sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended) and should be read in conjunction with those Regulations, which specify in detail what can and cannot be transferred and the penalties for any offences that are committed.

6.2.12 Ship to Ship transfers outside of port authority areas are generally prohibited within the UK territorial sea. An exemption is provided for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling. It is anticipated that Ship to Ship transfers will not be necessary during the construction or O&M of the Development beyond 'operationally necessary' (see Table 6.2) refuelling of vessels.

6.2.13 Note that these regulations only cover transfers between vessels, they do not regulate transfers from a vessel to an offshore or renewable energy installation. Transfers of fuel from vessels to such installations should be carried out with due regard to crew and vessel safety and with appropriate environmental safeguards.

6.2.14 Table 6.2 below provides an extract from MSN 1829 as relevant to ship to ship refuelling arrangements.

Table 6.2 - MSN 1829: Mother-craft/daughter-craft refuelling arrangements

3. Mother-craft/daughter-craft refuelling arrangements
3.1 The regulations provide a specific exemption for vessels to refuel, or be refuelled by daughter-craft (e.g.: tenders, rescue boats, safety boats) so as not to impair local, operationally necessary refuelling where returning to shore is not practicable.
3.2 Examples of 'operationally necessary' refuelling include, but are not limited to, the fuelling of jack ups, platforms and other temporary installations as well as vessels with extremely restricted capability to leave station to take on fuel such as dredgers, workboats operating

offshore from mother-craft and accommodation vessels.

3.3 Transfers of fuel to and from daughter-craft should be carried out with due regard to crew and vessel safety and with appropriate environmental safeguards.

3.4 Particular care should be taken to ensure that appropriate training has been provided to those carrying out the transfer and that equipment is maintained correctly on both the supplying and receiving craft.

Use of Chemicals

6.2.15 The following section includes additional detail to that presented in Table 6.1 above and is provided to clearly address the requirements of the relevant Marine Licence conditions.

List of Notified Chemicals

6.2.16 The List of Notified Chemicals (refer to condition 3.1.7 of the Marine Licences) is a product of the Offshore Chemical Notification Scheme (OCNS) which manages chemical use and discharge by the UK and Netherlands offshore petroleum industries, but which is also applied to the offshore renewables industry where relevant. The scheme is regulated in the UK by the Department for Business Energy and Industrial Strategy (BEIS) using scientific and environmental advice from Cefas and Marine Scotland. A description of the OCNS is provided in Table 6.3 below.

6.2.17 As noted in Table 6.3 the OCNS does not apply to all chemicals. The transfer and use of general items such as certain types of lubricants and oils will not appear on this list of notified chemicals.

Table 6.3 - The Offshore Chemical Notification Scheme

The Offshore Chemical Notification Scheme (OCNS) applies to all chemicals used in the exploration, exploitation and associated offshore processing of petroleum on the UK Continental Shelf.

It incorporates "operational" chemicals/products* which, through their mode of use, are expected in some proportion to be discharged. This includes rig washes, pipe dopes, jacking greases and hydraulic fluids used to control wellheads and blow-out preventers. As well as those chemicals used in the actual production of hydrocarbons, those generated offshore (such as sodium hypochlorite) must also be notified.

Chemicals not covered

The scheme does not apply to chemicals that might otherwise be used on a ship, helicopter or other offshore structure. Products used solely within domestic accommodation areas – such as additives to potable water systems, paints and other coatings, fuels, lubricants, fire-fighting foams, hydraulic fluids used in cranes and other machinery – are also exempt.

Source: <http://www.cefas.defra.gov.uk/industry-information/offshore-chemical-notification-scheme/about-ocns.aspx>

Use, Storage and Transport of Chemicals

6.2.18 BOWL will require their contractors to ensure that:

- Where relevant, chemicals are selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002. Where the Project requires the use of chemicals not listed in the List of Notified Chemicals, BOWL will request approval in writing from Marine Scotland/ Licensing Authority prior to their use;
- All substances and objects deposited are inert (or appropriately coated or protected) and do not contain toxic elements;
- Suitable bunding and storage facilities are employed to prevent the release of fuel oils and lubricating fluids into the marine environment.

6.2.19 BOWL will require that these requirements are addressed within contractors risk assessments and method statements. Each contractor shall provide a chemical inventory within their risk assessments, detailing how and when chemicals are to be used, stored and transported in accordance with good practice guidance, including where relevant (but not limited to):

- Transport of chemicals in line with the International Maritime Dangerous Goods (IMDG) Code;
- Storage of chemicals in line with the Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended), the REACH Enforcement Regulations 2008 (as amended), the CLP Regulation (European Regulation (EC) No 1272/2008) and HSE guidance on offshore storage of chemicals (OCM guidance note 8), in addition to applicable manufacturer's guidance on storage; and
- Use of chemical products in accordance with manufacturer's instructions and recommendations.

6.2.20 On board each vessel a nominated individual will be responsible for ensuring that all chemicals are adequately stored and protected and shall, in conjunction with project and marine personnel, ensure that an efficient Stock Control System is in operation. This system shall include records for receipt, distribution and balance of all chemicals. The chemicals for each system / project shall be marked with the project number and stored in an area reserved for that project. Chemicals shall, at all times, be stored under lock and key, if possible.

6.2.21 The nominated individual will ensure that all suppliers' special instructions and delivery notes are rigorously complied with during handling, storage and use. Correct lifting procedures shall be followed to ensure safe, efficient chemical handling. Personnel shall be kept informed of all precautions concerning the storage and handling of chemicals arriving on-board.

6.2.22 Safety Data Sheets (SDS) and Control of Substances Hazardous to Health (COSHH) sheets for each chemical substance will be reviewed to inform the risk assessment, and will be appended to the risk assessments. These data sheets must also be held on site where the chemicals are stored and/or used. The risk assessments and method statements will also contain control measures to ensure that risk to the marine environment is minimised during use, storage and transport of chemicals.

6.3 Estimated Hydrocarbon and Chemical Inventory

6.3.1 The type of hydrocarbons and chemicals that may be used during the construction and O&M phases of the Development are listed in Table 6.4. Within the table, hydrocarbons are allocated to one of four 'groups' as defined by International Tanker Owners Pollution Federation (ITOPF) classification. Group 1 hydrocarbons are considered to be least persistent (i.e. if spilled, they will dissipate and not form a surface emulsion) whilst Group 4 hydrocarbons are very persistent (i.e. if spilled, they will not evaporate or disperse).

6.3.2 Information on the volume of these hydrocarbon types involved in the Development activity at any one time will be dependent on the specific vessels available to undertake the construction works. Key Contractors will provide vessel data sheets for each of the main construction vessels to BOWL. In the event of a pollution incident this information will be made available to the primary responder or response cells if required.

Table 6.4 - Types of hydrocarbons and chemicals to be used during the Construction and Operational Phases of the Development

Type of Oil	ITOPF Oil Group	Comments
Intermediate Fuel Oil (IFO)	Group 3	Used as fuel for vessels involved in construction.
Marine Gas Oil (MGO) (*Diesel*)	Group 2	Used as fuel for vessels involved in construction.
Lubricating Oil	Group 3	Used for vessels involved in construction.
Hydraulic Oil	Group 2/3	Hydraulic oil used within plant equipment.
Chemicals	N/A	Various chemicals used routinely e.g., paints, paint thinners, solvents, coolants and cleaning fluids.
Intermediate Fuel Oil (IFO)	Group 3	Used as fuel for vessels involved in any maintenance activities involving use of a jack-up vessel.
		Used as fuel for vessels involved in routine O&M activities.
Marine Gas Oil (MGO) (*Diesel*)	Group 2	Used as fuel for vessels involved in significant maintenance activity.
		Used as fuel for vessels involved in routine O&M activities.
Lubricating Oil	Group 3	Used for vessels involved in significant O&M activities.

Type of Oil	ITOPF Oil Group	Comments
		Used for vessels involved in routine O&M activities.
Transformer Oil	Group 3	Synthetic ester oil used in OTMs and WTGs.
Hydraulic Oil	Group 2/3	Hydraulic oil used within plant equipment.
Gear Oil	Group 3	Oil for yaw gear in WTG.
Chemicals	N/A	Various chemicals used routinely e.g., paints, paint thinners, solvents, coolants and cleaning fluids.

PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE

7 Marine Pollution Incident Response Procedures

7.1 Introduction

7.1.1 This section sets out the procedures to be adhered to in the event of a marine pollution incident.

7.1.2 BOWL require that any spill (actual or probable) into the marine environment, no matter how small, and no matter whether it arises from BOWL activities or not, is responded to following the procedures set out below.

7.1.3 Priority in the event of a spill is to take measures to ensure the safety of personnel and the offshore installations and vessels, and to prevent escalation of the incident.

7.1.4 Where a spillage is part of a wider emergency, such as fire or explosion, reference should also be made to the BOWL Emergency Response Cooperation Plan (ERCoP) (LF000007-PLN-187) and Emergency Response Plan (LF000005-PLN-174).

7.2 Spills Originating from a Vessel - Response and Notification

7.2.1 The process set out below should be followed in the event of a marine pollution (hydrocarbon or chemical) incident where a spill originates from a vessel, from vessel related activity or from a Key Contractor owned asset prior to transfer of ownership to BOWL during construction or maintenance of offshore installations.

7.2.2 When a spill is observed, it will be reported to the Vessel Master.

7.2.3 The Vessel Master will report the spill as soon as it is safe to do so, to Coastguard Operations Centre (CGOC) Shetland via phone, and then to the Marine Coordinator via phone. Verbal notification should be followed up when practicable with the submission by the vessel master of a Marine Pollution Report (POLREP) via email (or fax) to the CGOC and the Marine Coordinator.

7.2.4 The Key Contractor responsible for the vessel from which the spill has originated will engage the vessel SOPEP and assume primacy for the incident ensuring ongoing reporting on spill status as necessary and initiating response or clean-up operations as required. The relevant Key Contractor, as the primary responder, will request support from a specialist spill response contractor as required. The Marine Coordinator will provide a supporting role and assist with communication throughout an incident.

7.2.5 In the event that a regional or national (Tier 2 or 3) response is required the MCA may take charge of the situation and implement the National Contingency Plan (as detailed in Section 5.6).

7.2.6 The following stages will be observed in managing a marine pollution incident originating from a vessel or vessel related activity:

ASSESS SITUATION AND COMMENCE RESPONSE
ACTIONS to be taken by Spill Observer: • Contact all personnel in the vicinity of the leak or spill and warn of the potential hazard. • If safe to do so, stay in vicinity of the leak or spill and continue observation. • If safe to do so, take any reasonable action to contain or reduce the leak or spill.
NOTIFICATIONS to be made by Spill Observer: • Spill Observer shall report it directly to the Vessel Master.

REPORT SPILL
ACTIONS to be taken by Vessel Master: • The Vessel Master will activate the **Ship-board Oil Pollution Emergency Plan** (SOPEP), or equivalent vessel-specific spill plan. • Where a spill originates from a vessel in a harbour or port, the Vessel Master shall notify the Harbour or Port Authority. • If safe to do so, immediately initiate actions to identify source and stop leakage at source. • Maintain safety of Personnel; the installation / vessel; any vessel within 500 metres. • Initiate a chronological log of events and actions taken – maintain this log until stand down. **ACTIONS to be taken by Marine Coordinator:** • Ensure a log keeper is assigned to monitor response operations and keep a chronological log of events and conversations.
NOTIFICATIONS to be made by Vessel Master: • **All marine pollution incidents must be reported as soon as is safely possible to the Coastguard Operations Centre (CGOC) Shetland via phone (or via VHF radio) on 01595 692976.** • The initial verbal report to CGOC Shetland via phone (or VHF radio) must be followed up when practicable with the submission of a **Marine Pollution Report** (POLREP) via email (or fax) to CGOC Shetland at shetland.coastguard@hmcg.gov.uk. The Vessel Master will submit the POLREP. A POLREP template is provided in PART 3, Section 9. • Note that CGOC Shetland will pass the POLREP on to the MCA Counter Pollution and Response Branch, who will advise on actions to be taken, and at the same time issue it to other relevant authorities. • The Vessel Master shall inform the Marine Coordinator of the spill. **NOTIFICATIONS to be made by Marine Coordinator:** • The Marine Coordinator will report the incident to the SSE hotline, within 30 minutes, or as soon as it is safe to do so on 0800 107 3207. • The Marine Coordinator will inform the BOWL Ecological Clerk of Works (ECoW) of the incident and the other responsible BOWL personnel (Project Manager and SHE Manager)

who will assist if requested to do so by the primary responder.

CLASSIFY AND QUANTIFY SPILL
ACTIONS to be taken by Vessel Master: • Confirm source and estimate quantity of oil / chemical spilled. Classify spill size and determine likely slick movement. • Assess the ongoing nature of the spill and the possible need to mobilise additional resources.
NOTIFICATIONS to be made by Vessel Master: • Updates on status of incident to be passed to CGOC Shetland (verbally and/or via submission of updates to the POLREP form) (and other response organisations as relevant) and as detailed within the vessels SOPEP. • Information on the nature of the spill to be reported on ongoing basis to Marine Coordinator.

DECIDE UPON RESPONSE STRATEGY
ACTIONS to be taken by Vessel Master: • Vessel Master to liaise with the relevant authorities to decide upon and implement initial response strategy in line with the vessel SOPEP. Response strategy may alter as spill is monitored and evaluated. • Vessel Master to liaise with the Marine Coordinator who will assist with dissemination of information as required. **ACTIONS to be taken by Marine Coordinator:** • Marine Coordinator to liaise with Vessel Master, relevant authorities and other contractors if requested to provide support to the primary responder.

SAMPLE OIL AND TRACK SLICK
ACTIONS to be taken by Vessel Master: • If no risk to personnel, request vessel to track oil spill location and take samples and photographs of spilled oil. • Sampling of the oil spill and tracking will be undertaken by trained personnel (See Section 5.4). In the event that the spill escalates to a Tier 2 or Tier 3 spill advice will be sought from an Oil Spill Response Contractor who may choose to sample and track a slick using vessel based or aerial observations as required. **ACTIONS to be taken by Marine Coordinator:** • Liaise with Vessel Master and other resources as available (e.g. standby vessels) to assist with slick monitoring if requested (towards other installations/environmentally sensitive

areas/coastal regions).

MONITOR AND EVALUATE SPILL

ACTIONS to be taken by Vessel Master:
• Monitor and evaluate spill and continue to report on spill status in line with the vessel SOPEP and on the following:
  ○ Overall extent and on-going nature of oil slick;
  ○ Direction of movement, especially noting other installations and vessels in the vicinity;
  ○ Proximity to environmentally sensitive areas (as set out in the ES (BOWL, 2012) and SEIS (BOWL, 2013)) and other relevant BOWL Consent Plans, including the Environmental Management Plan (EMP), Piling Strategy (PS) and Vessel Management Plan (VMP));
  ○ Areas possibly in need of urgent clean-up measures;
  ○ Need for additional assistance and back-up services;
  ○ Progress and dispersion of slick during clean-up operations.
• In the event that on site resources are not able to adequately respond to the existing spill or if the existing spill is likely to escalate, the Vessel Master may seek to engage greater response resources as detailed within the Vessel SOPEP.

STAND DOWN AND PREPARE INCIDENT REPORT

ACTIONS to be taken by Vessel Master:
• Ensure that any waste arising from a spill is managed in accordance with the procedures set out in the BOWL Environmental Management Plan (EMP) (Annex 6 – Waste Management Measures) and disposed of responsibly.
• Make an assessment of when to demobilise any response. Commence “stand-down” procedures as follows:
  ○ Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down;
  ○ Prepare internal incident report, provide incident log and remain accessible to support other personnel in compiling their reports.
ACTIONS to be taken by Marine Coordinator:
• Assist with dissemination of information to all relevant parties if requested to do so.

7.2.7 In addition to the reporting requirements above, and in line with the approved Environmental Management Plan (EMP) (LF000005-PLN-026), the ECoW will be notified of an incident by the Marine Coordinator as soon as practicable. Throughout the duration of an incident the ECoW will be available to provide advice to the primary responder on environmental sensitivities for consideration when developing a

response strategy. The ECoW will also be provided with copies of logs and notifications setting out details of the incident and will notify the BOWL CLT and MS-LOT within 24 hours for serious incidents (and 72 hours for less serious incidents), providing the incident report when available, and liaising with the Licensing Authority on any further actions to be taken.

7.2.8 The ECoW will receive a copy of the final incident report incorporating details of the incident and response measures taken and will be responsible for making the required submissions to MS-LOT following conclusion of the incident.

7.2.9 Following the incident the BOWL Construction Team shall work with all relevant contractors and the BOWL management team through a lessons learned process, and review and update procedures where necessary.

Notification Checklists for Spill Originating from a Vessel

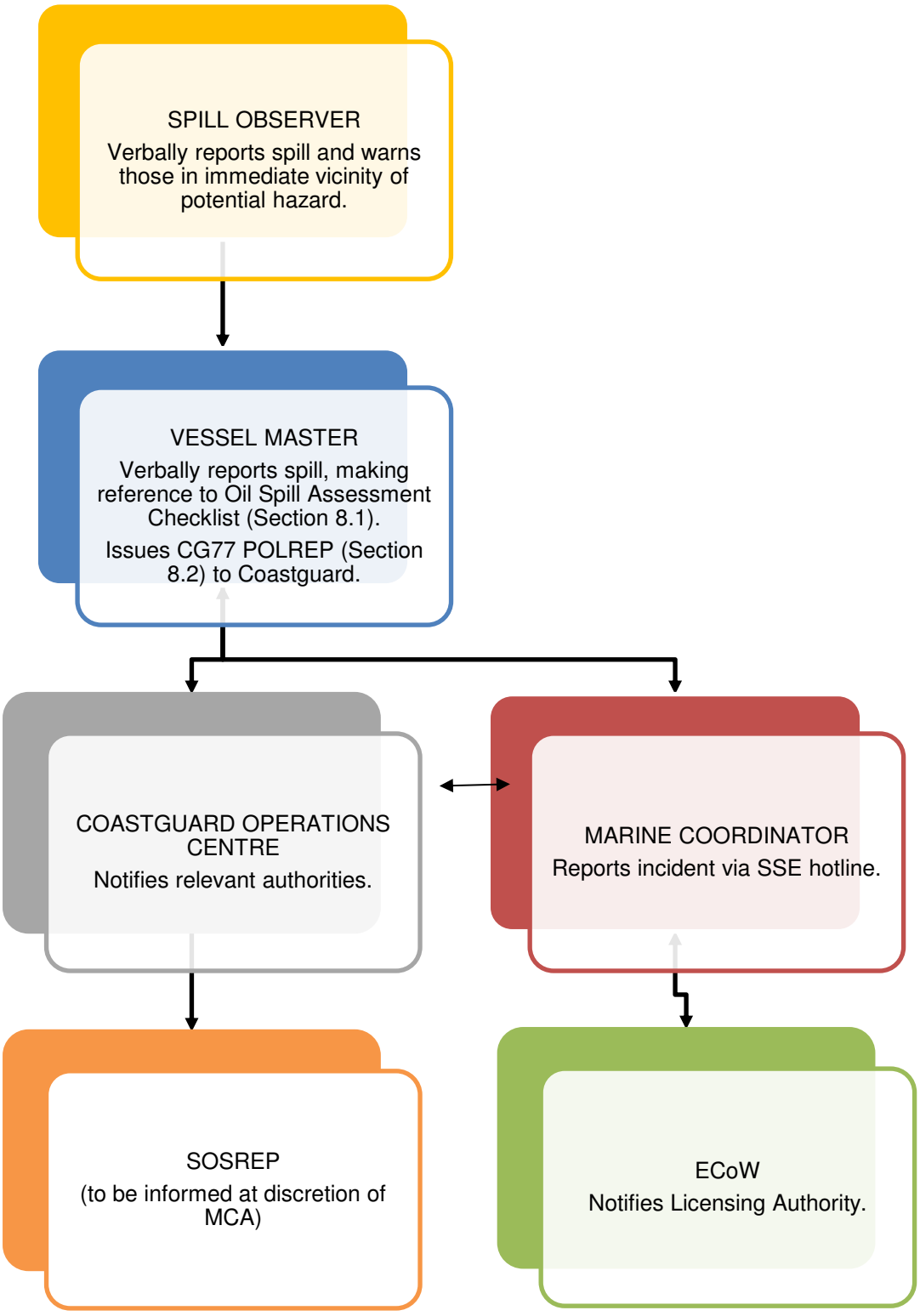
7.2.10 Key actions and notifications for the following personnel are summarised in Checklists 7.1 to 7.4, respectively:

Spill Observer (first person sighting the pollution incident)
Vessel Master
Marine Coordinator
BOWL Ecological Clerk of Works (ECoW)

7.2.11 The following checklists should be referred to and completed in the event of an oil spill arising from a vessel or vessel related activity and actions and notifications checked off during incident response (following the key stages set out above). Completed checklists will be submitted to the BOWL Construction Team following the incident as part of the auditing process to determine lessons learned from any spill response procedures, and any amendments to procedures required to prevent the incident occurring again.

7.2.12 The flow of information between the personnel listed above is summarised in Figure 7.1. Following initial notification of the spill, communications between all parties is likely to be regular and ongoing throughout the response.

Figure 7.1 - Flow of information during initial reporting of a spill originating from a vessel or vessel related activity.



Checklist 7.1 – SPILL OBSERVER (first person sighting the pollution incident) – Actions & Notifications

Actions below should be completed by the person who observes the spill	
INITIAL ACTIONS	
❒	Notify the Vessel Master and provide details of: • Time of spill; • Possible source of spill; • Current spill location; • Oil / chemical type; • Estimation of quantity of oil / chemical spilled; and • Any other relevant actions.
❒	Contact all personnel in the vicinity of the leak or spill and warn of the potential hazard.
ONGOING ACTIONS	
❒	**If safe to do so,** stay in vicinity of the leak or spill and continue observation.
❒	**If safe to do so,** take any reasonable action to contain or reduce the leak or spill.

Checklist 7.2 - VESSEL MASTER – Actions & Notifications

Completion of the actions below are the responsibility of the Vessel Master	
INITIAL ACTIONS	
❒	Receive report on spill from Spill Observer and take charge of the situation.
❒	**If safe to do so,** immediately initiate actions to identify source and stop leakage at source.
❒	Maintain safety of: • Personnel; • The installation / vessel; • Any vessel within 500 metres.
❒	Notify CGOC Shetland of spill via telephone (or Harbour / Port Authority if spill in harbour/port).
❒	Activate the SOPEP, or equivalent vessel-specific spill plan.
❒	Inform the Marine Coordinator.
❒	Submit completed POLREP form to CGOC Shetland via email or fax.
❒	Initiate a chronological log of events and actions taken – maintain this log until stand down.
ONGOING ACTIONS	
❒	Confirm source and estimate quantity of oil / chemical spilled. Classify spill size and determine likely slick movement. Pass information to Marine Coordinator.
❒	Assess the ongoing nature of the spill and the possible need to mobilise additional resources. Seek advice from an oil spill response contractor as required on the following: • Overall extent and on-going nature of oil slick; • Direction of movement, especially noting other installations and vessels in the vicinity; • Proximity to environmentally sensitive areas; • Areas possibly in need of urgent clean-up measures; • Need for additional assistance and back-up services; • Progress and dispersion of slick during clean-up operations. In the event that on site resources are not able to adequately respond to the existing spill or if the existing spill is likely to escalate inform the Marine Coordinator as soon as practicable who will support the mobilisation of additional resources and

	assist with seeking advice as required.
❒	Ensure a log keeper is assigned and continues to maintain a chronological log of response procedures, events and conversations.
CLOSE-OUT ACTIONS	
❒	Make an assessment of when to demobilise any response. Commence "stand-down" procedures as follows: • Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down; • Prepare internal incident report, provide incident log and remain accessible to support personnel in compiling their reports.
❒	At the end of the incident, stand down response and input to report of the incident for BOWL.

Checklist 7.3 - MARINE COORDINATOR– Actions & Notifications

Completion of the actions below are the responsibility of the Marine Coordinator	
INITIAL ACTIONS	
❒	Receive report on spill from Vessel Master.
❒	On notification from the Vessel Master, record all details of the incident and all incoming information and conversations, maintaining a chronological log of events, including issue of notifications.
❒	Make 30-minute report to SSE hot line on 0800 107 3207.
❒	Notify the ECoW of the spill.
❒	Maintain contact with the Vessel Master. Provide assistance and support to facilitate communications as required.
❒	Assist the Vessel Master in arranging for photographs and samples to be taken of the slick.
ONGOING ACTIONS	
❒	Assist the Vessel Master and primary responder to reduce or prevent further oil / chemical leakage without endangering the safety of personnel.
❒	Liaise with and co-operate with statutory bodies as necessary and communicate relevant information to the primary responder.
❒	Ensure all other installations and vessels in the vicinity have been informed of the spill if deemed necessary.
❒	Liaise with the Vessel Master and primary responder to ensure that the slick is monitored until complete dispersion.
CLOSE-OUT ACTIONS	
❒	Marine Coordinator assist with “stand-down” procedures in liaison with the Vessel Master.
❒	Collect copies of all Incident Logs provided by the Vessel Master.
❒	Ensure that a “lessons identified” profile is available quickly so that remedial action and the possible upgrading of procedures can take place.

Checklist 7.4 - ECoW – Actions & Notifications.

Completion of the actions below is the responsibility of the ECoW	
INITIAL ACTIONS	
❒	On notification from the Marine Coordinator, notify the BOWL Consents and Licensing Team at the earliest opportunity and, in any event, within 24 hours.
❒	On notification from the Marine Coordinator, notify the Licensing Authority within 24 hours for serious incidents (and 72 hours for less serious incidents).
❒	Ensure appropriate spill notifications have been issued as required by this MPCP. Record times and key details of notifications.
❒	Provide advice on environmental sensitivities and assistance to the Marine Coordinator and primary responder, if required.
ONGOING ACTIONS	
❒	Provide advice to the Marine Coordinator, primary responder and/or any response cells that are established as required.
CLOSE-OUT ACTIONS	
❒	Remain accessible to support personnel in compiling their reports.
❒	Work with the BOWL Construction Team to ensure that a “lessons identified” profile is available quickly so that remedial action and the possible upgrading of procedures can take place (and update/amend this MPCP where necessary).
❒	Following the ‘lessons learned’ process issue close-out note to MS-LOT setting out remedial action and amendments and updates to the MPCP and procedures.

7.3 Spills Originating from a BOWL Installation – Actions and Notifications

7.3.1 When a spill is observed, it will be reported to the Marine Coordinator.

7.3.2 The Marine Coordinator will then report the spill to CGOC Shetland via phone. Verbal notification should be followed up when practicable with the submission of a POLREP via email (or fax) to the CGOC by the Marine Coordinator.

7.3.3 The Marine Coordinator will engage the MPCP and assume primacy of the incident. The Marine Coordinator will be responsible for ongoing reporting on spill status and will coordinate an initial response with the spill observer who may utilise spill kits on the offshore installation. The primary responder will request support from a specialist spill response contractor as required.

7.3.4 As detailed in Section 6.2 and Table 6.1 the quantities and type of hydrocarbons and chemicals on the wind turbines and OTMs are not sufficient to warrant a Tier 2 or Tier 3 response. It is therefore not anticipated that the MCA would implement the National Contingency Plan or take command of an incident from an offshore installation. However, the MCA will be kept informed by verbal communications and through ongoing submission of the POLREP.

7.3.5 The following stages will be observed in managing a marine pollution incident where the spill originates from an offshore installation:

ASSESS SITUATION AND COMMENCE RESPONSE
ACTIONS to be taken by Spill Observer: • Contact all personnel in the vicinity of the leak or spill and warn of the potential hazard. • If safe to do so, stay in vicinity of the leak or spill and continue observation. • If safe to do so, take any reasonable action to contain or reduce the leak or spill using minor spill kits on the WTGs and OTMs.
NOTIFICATIONS to be made by Spill Observer: • The Spill Observer shall notify the Marine Coordinator.

REPORT SPILL
ACTIONS to be taken by Spill Observer: • If safe to do so, immediately initiate actions to identify source and stop leakage at source. • Maintain safety of personnel; the installation and any vessel within 500 metres. • Initiate a chronological log of events and actions taken – maintain this log until stand down.
NOTIFICATIONS to be made by the Marine Coordinator:

- **All marine pollution incidents must be reported as soon as is safely possible to the Coastguard Operations Centre (CGOC) Shetland via phone (or via VHF radio) on 01595 692976.**
- The initial verbal report to CGOC Shetland via phone (or VHF radio) must be followed up when practicable with the submission of a **Marine Pollution Report** (POLREP) via email (or fax) to CGOC Shetland at shetland.coastguard@hmcg.gov.uk. The Marine Coordinator will submit the POLREP. A POLREP template is provided in PART 3, Section 9.
- Note that CGOC Shetland will pass the POLREP on to the MCA Counter Pollution and Response Branch, who will advise on actions to be taken, and at the same time issue it to other relevant authorities.
- The Marine Coordinator will notify other operators/users in the vicinity of the spill.
- The Marine Coordinator will report the incident to the SSE hotline, within 30 minutes, or as soon as it is safe to do so on 0800 107 3207.
- The Marine Coordinator will inform the BOWL Ecological Clerk of Works (ECoW) of the incident and the other responsible BOWL personnel (Project Manager and SHE Manager).
- Ensure a log keeper is assigned to monitor response operations and keep a chronological log of events and conversations.

CLASSIFY AND QUANTIFY SPILL

ACTIONS to be taken by Spill Observer:

- Confirm source and estimate quantity of oil / chemical spilled. Classify spill size and determine likely slick movement.
- Assess the ongoing nature of the spill and the possible need to mobilise additional resources.

NOTIFICATIONS to be made by Marine Coordinator:

- Updates on status of incident to be passed to CGOC Shetland (verbally and/or via submission of updates to the POLREP form) (and other response organisations as relevant).

DECIDE UPON RESPONSE STRATEGY

ACTIONS to be taken by Marine Coordinator:

- Marine Coordinator to liaise with contractors and vessels and request and coordinate support if required.

SAMPLE OIL AND TRACK SLICK

ACTIONS to be taken by Marine Coordinator:

- If no risk to personnel or installation, request a vessel to track oil spill location and take samples and photographs of spilled oil.
- Sampling of the oil spill and tracking will be undertaken by trained personnel (See Section

5.4).

- Liaise with Spill Observer and other resources as available (e.g. standby vessels) to assist with slick monitoring.

MONITOR AND EVALUATE SPILL

ACTIONS to be taken by Marine Coordinator:

- Liaise with the Spill Observer to maintain slick monitoring, as required, and observe the following:
  - Overall extent and on-going nature of oil slick;
  - Direction of movement, especially noting other installations and vessels in the vicinity;
  - Proximity to environmentally sensitive areas (as set out in the ES (BOWL, 2012) and SEIS (BOWL, 2013) and other relevant BOWL Consent Plans, including the Environmental Management Plan (EMP), Piling Strategy (PS) and Vessel Management Plan (VMP));
  - Areas possibly in need of urgent clean-up measures;
  - Need for additional assistance and back-up services;
  - Progress and dispersion of slick during clean-up operations.
- Ensure that the slick is monitored until complete dispersion.

STAND DOWN AND PREPARE INCIDENT REPORT

ACTIONS to be taken by Marine Coordinator:

- Ensure that any waste arising from a spill is managed in accordance with the procedures set out in the BOWL Environmental Management Plan (EMP) (Annex 6 – Waste Management Measures) and disposed of responsibly.
- Make an assessment of when to demobilise any response. Commence “stand-down” procedures as follows:
  - Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down;
  - Prepare internal incident report and remain accessible to support other personnel in compiling their reports.

7.3.6 In the event of a spill from an installation the ECoW will be notified of an incident by the Marine Coordinator as soon as practicable. Throughout the duration of an incident the ECoW will remain available to provide advice to the Marine Coordinator on environmental sensitivities for consideration when developing a response strategy. As with spills arising from vessels and vessel activity the ECoW will be provided with copies of logs and notifications and will maintain responsibility for notifying the BOWL CLT and MS-LOT within 24 hours for serious incidents (and 72

hours for less serious incidents). The ECoW will provide the incident report when available, and liaise with the Licensing Authority on any further actions to be taken.

7.3.7 The ECoW will maintain responsibility for making the required submissions to MS-LOT following conclusion of the incident.

7.3.8 As with spills arising from vessels and following the incident the BOWL Construction Team will initiate the lessons learned process, and review and update procedures where necessary.

Notification Checklists for Spills Originating from an Offshore Installation

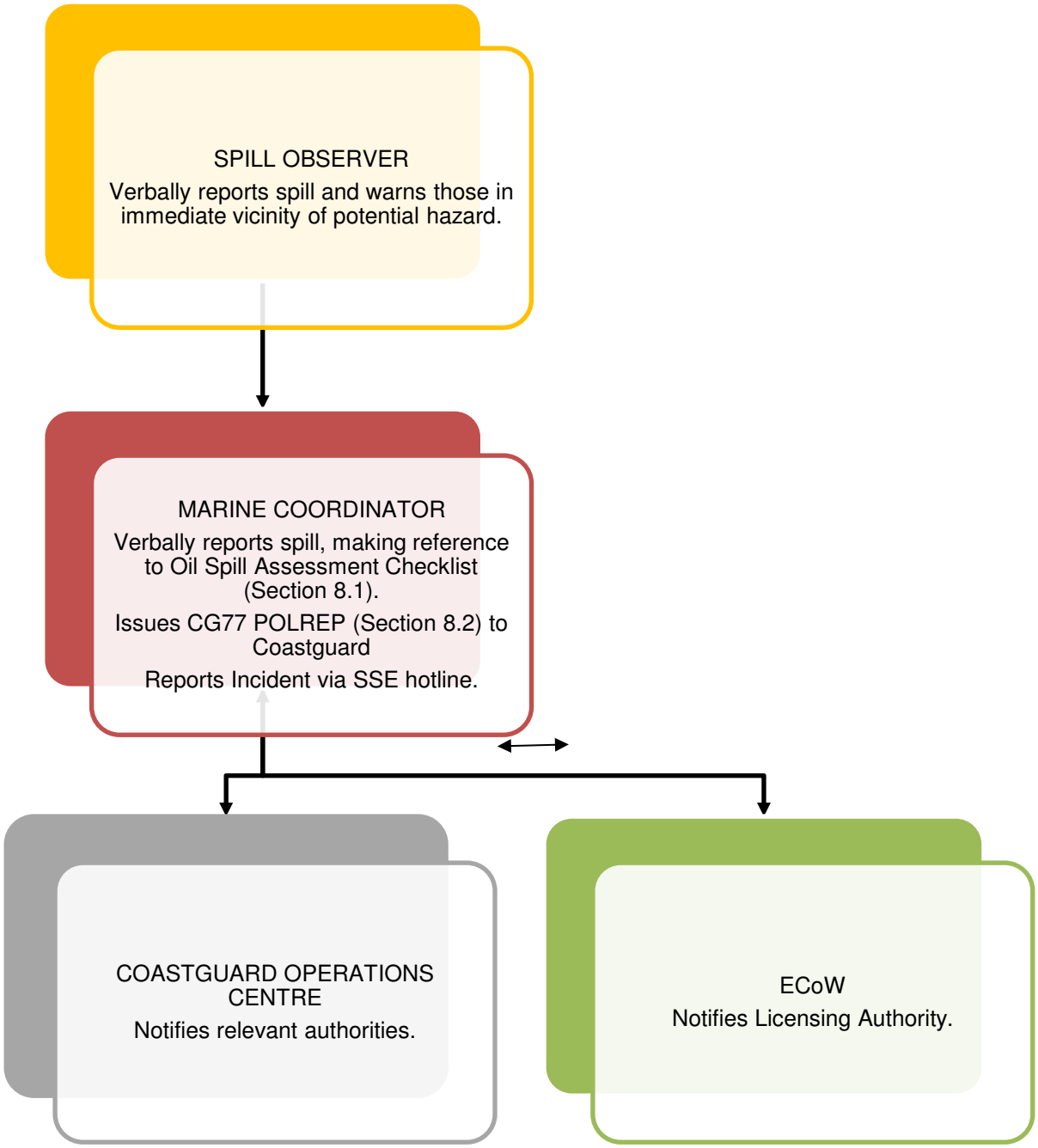
7.3.9 Key actions and notifications for the following personnel are summarised in Checklists 7.5 to 7.7, respectively:

Spill Observer (first person sighting the pollution incident)
Marine Coordinator
BOWL Ecological Clerk of Works (ECoW)

7.3.10 Checklists should be referred to and completed in the event of an oil spill and actions and notifications checked off during incident response (following the key stages set out above). Completed checklists will be submitted to the Marine Coordinator following the incident as part of the auditing process to determine lessons learned from any spill response procedures, and any amendments to procedures required to prevent the incident occurring again.

7.3.11 The flow of information between the personnel listed above is summarised in Figure 7.2. Following initial notification of the spill, communications between all parties is likely to be regular and ongoing throughout the response.

Figure 7.2 - Flow of information during initial reporting of a spill originating from an offshore installation



Checklist 7.5 – SPILL OBSERVER (first person sighting the pollution incident) – Actions & Notifications

Actions below should be completed by the person who observes the spill	
INITIAL ACTIONS	
❒	Notify the Marine Coordinator and provide details of: • Time of spill; • Possible source of spill; • Current spill location; • Oil / chemical type; • Estimation of quantity of oil / chemical spilled; and • Any other relevant actions.
❒	Contact all personnel in the vicinity of the leak or spill and warn of the potential hazard.
ONGOING ACTIONS	
❒	**If safe to do so,** stay in vicinity of the leak or spill and continue observation.
❒	**If safe to do so,** take any reasonable action to contain or reduce the leak or spill.

Checklist 7.6 – Marine Coordinator – Actions & Notifications

Completion of the actions below are the responsibility of the Marine Coordinator	
INITIAL ACTIONS	
❒	Receive report on spill from Spill Observer and take charge of the situation.
❒	**If safe to do so,** immediately initiate actions to assist with identifying the source and stop leakage at source.
❒	Maintain safety of: • Personnel; • The installation; • Any vessel within 500 metres.
❒	Notify CGOC Shetland of spill via telephone (or Harbour / Port Authority if spill in harbour/port).
❒	Activate the MPCP.
❒	Submit completed POLREP form to CGOC Shetland via email or fax.
❒	On notification from the Spill Observer, record all details of the incident and all incoming information and conversations, maintaining a chronological log of events, including issue of notifications.
❒	Make 30-minute report to SSE hot line on 0800 107 3207.
❒	Notify the ECoW of the spill.
❒	Maintain contact with the Spill Observer. Ensure the slick is being observed, and determine likely slick movement (towards other installations/environmentally sensitive areas/coastal regions).
❒	Assist the Spill Observer in arranging for photographs and samples to be taken of the slick.
ONGOING ACTIONS	
❒	Work with the Spill Observer and to reduce or prevent further oil / chemical leakage without endangering the safety of personnel.
❒	Assess the ongoing nature of the spill and the possible need to mobilise additional resources. Seek advice from an oil spill response contractor as required on the following: • Overall extent and on-going nature of oil slick; • Direction of movement, especially noting other installations and vessels in the vicinity;

	• Proximity to environmentally sensitive areas; • Areas possibly in need of urgent clean-up measures; • Need for additional assistance and back-up services; • Progress and dispersion of slick during clean-up operations.
❒	Ensure a log keeper is assigned and continues to maintain a chronological log of response procedures, events and conversations.
❒	Liaise with and co-operate with statutory bodies as necessary in determining and managing spill response.
❒	Ensure all other installations and vessels in the vicinity have been informed of the spill if deemed necessary.
❒	If no risk to personnel or installation, request vessel to track oil spill location and take samples of spilled oil. Ensure spill is tracked until complete dispersion.
CLOSE-OUT ACTIONS	
❒	Make an assessment of when to demobilise any response. Commence "stand-down" procedures in liaison with the Marine Coordinator as follows: • Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down; • Prepare internal incident report and remain accessible to support personnel in compiling their reports.
❒	Collect copies of all Incident Logs available.
❒	Ensure that a "lessons identified" profile is available quickly so that remedial action and the possible upgrading of procedures can take place.

Checklist 7.7 - ECoW – Actions & Notifications.

Completion of the actions below is the responsibility of the ECoW	
INITIAL ACTIONS	
❒	On notification from the Marine Coordinator, notify the BOWL Consents and Licensing Team at the earliest opportunity and, in any event, within 24 hours.
❒	On notification from the Marine Coordinator, notify the Licensing Authority within 24 hours for serious incidents (and 72 hours for less serious incidents).
❒	Ensure appropriate spill notifications have been issued as required by this MPCP. Record times and key details of notifications.
❒	Provide advice on environmental sensitivities and assistance to the Marine Coordinator and primary responder, if required.
ONGOING ACTIONS	
❒	Provide advice to the Marine Coordinator as required.
CLOSE-OUT ACTIONS	
❒	Remain accessible to support personnel in compiling their reports.
❒	Work with the BOWL Construction Team to ensure that a “lessons identified” profile is available quickly so that remedial action and the possible upgrading of procedures can take place (and update/amend this MPCP where necessary).
❒	Following the ‘lessons learned’ process issue close-out note to MS-LOT setting out remedial action and amendments and updates to the MPCP and procedures.

7.4 Spill Classification

7.4.1 The response strategy that will be adopted in the event of a spill will ultimately depend upon several factors:

- The size and characteristics of the spilled oil/chemical;
- It's probable and predicted behaviour in the sea;
- Consideration of the environmental sensitivities in the path of the oil/chemical; and
- Consideration of the consequences of the different response options on the environment as a whole if they were to be adopted.

7.4.2 Oil spills will be classified in accordance with the internationally recognised and accepted three tier oil spill classification system (see Section 6.2). Chemical spills will be classified according to the characteristics of the chemical and the behaviour exhibited by the chemical when released into the marine environment (i.e. whether the chemical evaporates, floats on the surface of the water, dissolves in the water, or sinks to the seabed).

7.4.3 Figure 7.2 is provided as an aid to tier definition for any individual reporting and responding to a hydrocarbon spill. The primary responder will compile all available information and make a determination on response strategy and tier classification. If necessary, advice will be sought from CGOC and a specialist Oil Spill Response Contractor.

Figure 7.2 - Oil spill Tier assessment table

TICK ALL BOXES THAT APPLY: ☑ IF YOU ARE UNSURE, ASSUME WORST CASE	
TIER 1	
Small oil spills, or those which can be quickly and easily cleaned up using on-site resources or local contractors	
☐ Oil is contained within the incident site ☐ Spill occurs within immediate site proximity ☐ Daytime release ☐ Able to respond to the spill immediately	☐ Source of spill has been contained ☐ Oil is evaporating quickly and no danger of explosive vapours (e.g. diesel) ☐ Spill likely to naturally disperse ☐ No media interest
TIER 2	
Oil spills which pose a threat of significant pollution resulting in the mobilisation of external oil spill response resources on a regional level	
☐ Danger of fire or explosion ☐ Possible continuous release ☐ Concentrated oil accumulating in close proximity to the site / vessel, etc. ☐ Spill occurs within the vicinity of the operational site	☐ Not able to respond to the spill immediately ☐ Potential to impact other installations ☐ Tier 1 resources overwhelmed, requiring additional Tier 2 regional resources ☐ Potential impact to sensitive areas and/or local communities ☐ Local/ national media attention
TIER 3	
Catastrophic oil spills which pose a threat of significant pollution resulting in the mobilisation of external oil spill response resources on a national/ international level	
☐ Actual or potentially serious threat to life, property, industry ☐ Major spill beyond site vicinity ☐ Significant shoreline impact possible	☐ Tier 2 resources overwhelmed, requiring international Tier 3 resources (*appointment of Tier 2/3 contractor*) ☐ Oil migrating towards neighbouring countries ☐ Significant impact on local communities ☐ International media attention

7.5 Selecting a Response Strategy

Strategy Selection

7.5.1 The appropriate response strategy will depend not only on the potential limitations of each of the possible response options, but also on the type of oil spilled and the environmental sensitivities that are potentially threatened by the spill.

7.5.2 Table 7.3 presents the response strategies that are generally followed on the UK Continental Shelf (UKCS), according to spill Tier and oil type.

Table 7.3 - General response strategies according to spill Tier and oil type

Tier & Resources	**Response strategies**	
	Non-persistent Oil (MGO and Diesel)	**Persistent Oil (Hydraulic and Lube Oils)**
Tier 1 (small spill) On site resources	Natural dispersion and monitoring (using support vessel). If safe to do so, agitate using standby vessel propeller ('prop-wash'), by steaming through the slick at speed.	Natural dispersion and monitoring. Mechanical recovery where possible.
Tier 2 (medium spill) Spill Response Contractor and additional support where necessary	Natural dispersion and monitoring. Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities.	Consult specialist services from a spill response contractor. Continue to monitor and evaluate strategy using aerial surveillance. Boat-based dispersant application likely to be the primary response strategy – liaise with an oil spill response contractor as required. Consider mechanical recovery where possible. Mobilise shoreline containment and recovery equipment if shoreline is threatened – spill response contractor to engage additional support if necessary.
Tier 3 (large spill) Appointment of a Tier 2/3 Spill Response Contractor	Natural dispersion and monitoring (aerial surveillance). Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities.	Contract specialist services through the appointment of a Tier 2/3 spill response contractor. Continue to monitor and evaluate strategy using aerial surveillance. Aerial dispersant application likely to be the primary response strategy – through appointment of a Tier 2/3 spill response contractor. Consider mechanical recovery where possible. Mobilise shoreline containment and recovery equipment if shoreline is threatened.

7.5.3 Prior to construction the Key Contractors will make provisions for Oil Spill Response Contractors to assist in response operations during an incident as detailed in Section 5.5.

7.5.4 Based on the risk assessment in Table 6.1 of this MPCP, most oil spills potentially originating from the Development are likely to be of small volume (Tier 1) and of light non-persistent oil types. The spill response strategies most appropriate to this oil spill risk are detailed below.

7.6 Offshore Response Strategies for Tier 1 Incidents

Monitor & Evaluate

7.6.1 For all spills, any oil slick should be monitored from the outset. In the case of the Development, this will typically involve monitoring by use of a vessel, either already on site, or mobilised for the specific purpose. A detailed strategy for oil spill monitoring and evaluation is provided in Appendix C.

7.6.2 The physical appearance of any oil slick should be monitored closely, in addition to changes in the oil or changes to sea state conditions, which may influence the perceived environmental impact. Dispersant application is not normally necessary for Tier 1 spills.

Natural Dispersion

7.6.3 If light non-persistent oil has been spilled, the best strategy will be to allow physical processes to disperse the oil naturally. However, this strategy should always be backed up by thorough monitoring and evaluation.

7.6.4 If natural dispersion is selected as the key response strategy, it must be demonstrated through close monitoring of the oil slick that natural dispersion is in fact taking place.

7.6.5 If a light oil has been spilled, such as diesel or hydraulic oil, the process of natural dispersion can be aided by a technique called prop-washing. This involves using a vessel to steam at speed through the oil slick, creating a wash with the vessels propellers and wake. This procedure should only be used for small quantities of light oil; note that a heavily oiled hull may prohibit entry of a vessel to port.

7.6.6 Note that prop-washing will involve interference with the vessels hull and the oil slick itself, and may cause oil to be taken in by the vessels sea water intakes. Awareness of explosion risk from gas clouds or risk to crew on deck must be maintained with the vessel approaching with extreme caution and with appropriate mitigation such as approaching from upwind and taking gas readings.

7.6.7 Prop-washing should only be carried out if considered safe to do so by the Vessel Master. An alternative to prop washing is to agitate the slick with vessel fire hoses.

7.7 Tier 2/3 Strategies

7.7.1 In most cases, any oil spills from the Development are likely to be small in nature. However, in the unlikely event of a larger oil spill, or if the spilled oil persists, then regional or national response capabilities may need to be mobilised. It is anticipated that in the event that regional or national resources are required the MCA will implement the NCP and the SOSREP will take command of the incident (See Section 5.6). The Marine Coordinator will maintain continued communications with those on site (such as Vessel Masters) and provide assistance to the relevant response cells established by the MCA. The ECoW on the project will, where necessary or requested to do so, liaise with the SEG and STAC to ensure the effective transfer of information.

7.7.2 The Key Contractors oil spill response resources will be made available to the MCA throughout the duration of the incident (See section 5.5). The following additional resources may be deployed in response to a Tier 2 or Tier 3 incident.

Dispersant Application

7.7.3 There is the option to apply dispersant by sea and/or air to aid and accelerate natural processes dispersing the oil, thus removing it from the sea surface.

7.7.4 Due to the light nature of the oils associated with the Development, dispersant application is not likely to be a viable response option. However, in the unlikely event of a large spill of more persistent oil, dispersant application may be considered if the oil is not observed to be dispersing naturally.

7.7.5 Appropriate consultation is required with regulatory bodies before initiating the use of dispersant as a response.

7.7.6 Formal approval for dispersant use from Marine Scotland will be required in water depths of less than 20 metres or within 1 NM of such depths.

7.7.7 However, UK approved oil treatment products may be used without prior consultation with the licensing authority in *Force Majeure* situations where there is a genuine risk to human life or to the safety of an installation or vessel, such as where there is a serious danger from fire or explosion.

7.7.8 The window of opportunity to use chemical dispersants will be dependent upon various factors including the quantity of oil, sea temperature, the nature of the spill (i.e. instantaneous or continuous release), prevailing weather and environmental sensitivities.

7.7.9 For environmental sensitivities in the vicinity of the Development, refer to the BOWL ES, SEIS and relevant Consent Plans, including the EMP, PS and VMP.

7.7.10 A dispersant response capability would be available through the appointment of a Tier 2 and Tier 3 response contractor. BOWL will require the Key Contractors to engage a Tier 2/3 spill response contractor as detailed in Section 5.5.

7.7.11 The Marine Management Organisation (MMO) acts on behalf of Marine Scotland for the testing and approval of dispersants and other oil treatment products which are intended for use in all UK waters. It also regularly reviews existing approvals to ensure that products remain safe (MMO, 2015).

7.7.12 The MMO has published a list of the latest oil treatment products approved for use on the UKCS:

https://www.gov.uk/government/publications/approved-oil-spill-treatment-products

Offshore Containment & Recovery

7.7.13 For larger spills of more persistent oil in environmentally sensitive areas, or oils that are not amenable to dispersion at sea, offshore mechanical containment and recovery may be considered as a response option. This would involve the deployment of an oil recovery vessel(s) with offshore oil containment booms and oil skimming equipment.

7.7.14 Mechanical containment and recovery capability would be available through the appointment of a Tier 2/3 response contractor.

7.7.15 Note that for the general UKCS environment, offshore containment and recovery is not normally considered to be a viable response strategy due to the rough offshore weather conditions that are often encountered.

7.7.16 However, if a large volume of more persistent oil is spilled and the oil is not dispersing naturally, and the weather conditions are amenable, offshore containment and recovery may be a useful response strategy.

Chemical Spills

7.7.17 Volumes of chemicals utilised in the Development will be relatively small. Chemical spills are considered unlikely. A brief summary of potential response techniques for different groups of chemicals (according to their behaviour on contact with water) is presented below.

7.7.18 Gases and Evaporators - The release of a gas or evaporating liquid chemical has the potential to generate vapour clouds that might be toxic or form an explosive mixture with air. In an open environment, toxic vapour will usually disperse as a result of natural air movement and often the only feasible response measure will be to monitor any vapour cloud/plume as it disperses.

7.7.19 Floaters - Floaters may spreads across the water surface to form a slick. For spills

involving relatively persistent chemicals that float, it may be possible to detect and monitor floating materials. If safe, it may be possible to consider deploying booms to contain and control the movement of substances. Skimmers and other oil response equipment may also be used to recover material from the surface. Containment and recovery may not be advisable when dealing with highly toxic or flammable chemicals. In certain circumstances, sorbent materials may be deployed to collect and concentrate a chemical spill.

7.7.20 Dissolvers - The ability to contain and recover dissolved chemicals in extremely limited. Providing means to accelerate the natural processes of dispersion and dilution may be the only way to response to such chemicals. Some dissolved chemical plumes may, in theory, be neutralised, flocculated, oxidised or reduced by the application of other chemicals, but chemical treatment is unlikely to be practical and would not normally be recommended.

7.7.21 Sinkers - Chemicals that sink have the potential to contaminate the seabed and may persist in sediments. Response may therefore need to consider the recovery of any chemicals and heavily contaminated sediment. In shallow waters, mechanical dredgers and pump/vacuum devices may be used to recover materials.

PART 3 – INFORMATION DIRECTORY

8 Incident Response Forms

8.1 Oil Spill Assessment Checklist

8.1.1 To be referred to by the Primary Responder. This checklist ensures that the initial assessment of the oil spill is accurate and all aspects likely to affect the spill classification such as quantity, oil type and likely fate of the spilled oil, are considered thoroughly.

OIL SPILL ASSESSMENT CHECKLIST	
This checklist is designed to assist those personnel who have the primary responsibility of assessing the oil spill incident. These personnel are likely to be: • The Marine Co-ordinator; or; • The Vessel Master.	
STEP	**GUIDANCE**
Determine Essential Details	Location of pollution incident; Source of spill; Oil type; Extent of oil spill; Time of incident; Potential hazardous circumstances; Any other relevant information (particularly: is spill contained or ongoing?).
Assess Safety Hazards	Until otherwise established, assume oil spill is giving off potentially dangerous VOCs (i.e. gas or hydrocarbon vapours). **ELIMINATE IGNITION SOURCES** Approach Oil Spill from upwind to reduce effects of vapours. **APPROACH ONLY IF SAFE TO DO SO!**
Determine Oil Spill Source	If source unknown, investigate with care. Instigate actions to stop spillage at source. **IF SAFE TO DO SO!**
Estimate quantity of Oil released if exact amount unknown	Appendix C
Predict oil fate; determine direction and speed of oil movement in addition to weathering characteristics	Appendix C

Assess prevailing and if possible future weather conditions	Determine: • Wind speed and direction; • State of tide and current speed; • Sea state.

8.2 Marine Pollution Incident Report - CG77 POLREP

8.2.1 An incident report form, CG77 POLREP, is to be completed by the Primary Responder – specifically either the Vessel Master or Marine Coordinator as detailed in Section 7 in the event of a spill and issued to CGOC Shetland:

CGOC Shetland	**Tel: 01595 692976**	shetland.coastguard@hmcg.gov.uk

8.2.2 The Vessel Master or Marine Coordinator should not delay sending a report. If certain information is lacking, this may be provided at a later date.

8.2.3 Where a spill arises from a vessel or vessel related activity the Vessel Master will provide updates to CGOC and to the Marine Coordinator throughout any pollution incident verbally and/or via updates to the POLREP in line with the SOPEP. Where a spill arises from an installation the Marine Coordinator will provide updates to the CGOC verbally and through submission of a POLREP.

Reporting Pollution
CG77 - POLREP

INITIAL INCIDENT REPORT

A. Classification: -	
B. Date/Time/Observer: -	
C. Position and Extent of Pollution: -	
D. Tide: - Wind: -	
E. Weather: -	
F. Characteristics of Pollution: -	
G. Source and Cause of Pollution: -	
H. Details of Vessels in area: -	
I. Not Used	
J. Any Photographs or Samples: -	
K. Remedial Action: -	
L. Forecast of oil movement: -	
M. Names of others informed: -	
N. Other relevant information: -	

8.2.4 Guidance is given below on the type of information to be recorded in a CG77 POLREP.

A. Classification: - Select – Doubtful, Probable, ConfirmedSelect – Doubtful, Probable, ConfirmedSelect – Doubtful, Probable, ConfirmedSelect – Doubtful, Probable, Confirmed

B. Date/Time/Observer: - Enter date/time of obs. – state UTC or local time / Enter name or title of observer

C. Position and Extent of Pollution: - by latitude and longitude if possible, state range and bearing from some prominent landmark and estimated amount of pollution, e.g. size of polluted area; number of tonnes of spilled oil; or number of containers, drums etc. lost. When appropriate, give position of observer relative to pollution

D. Tide: - Speed/Direction **Wind: -** Speed/Direction

E. Weather: - Conditions and Sea State

F. Characteristics of Pollution: - give type of pollution, e.g. oil crude or otherwise; packaged or bulk chemicals; garbage. For chemicals, give proper name or United Nations Number, if known. For all, give appearance e.g. liquid; floating solid; liquid oil; semi-liquid sludge; tarry lumps; weathered oil; discoloration of sea; visible vapour etc.

G. Source and Cause of Pollution: - from vessels or other undertaking. If from a vessel, say whether as a result of apparent deliberate discharge or a casualty. If the latter, give a brief description. Where possible, give name, type, size, nationality and Port of Registry of polluting vessel. If vessel is proceeding on its way, give course, speed and destination, if known.

H. Details of Vessels in area: - to be given if the polluter cannot be identified and the spill is considered to be of recent origin.

I. Not Used

J. Any Photographs or Samples: - Give details of any photographs or samples taken.

K. Remedial Action: - Give details of any actions taken, or intended, to deal with spillage.

L. Forecast: - Likely effects of pollution – e.g. arrival on shore and estimated timings.

M. Names: - of others informed apart from addressees to this message.

N. Other relevant information: - e.g. Names of other witnesses or references to other instances of pollution which may point to a source.

8.3 Oil Spill Incident Log Sheet

8.3.1 To be completed by all key personnel involved in the oil spill response (see Section 7.2 and 7.3), including the Marine Coordinator. As a minimum, key decisions and events, communications, and deployment of resources should be recorded.

Name:	
Team:	
Role:	
Location:	
Date / Time	**Communication / Action Taken / Notes**

8.4 Incident Briefing Checklist

8.4.1 To be completed by the Marine Coordinator when briefing other members of staff.

BRIEFING CHECKLIST	
This checklist is designed to facilitate an effective response team briefing and should be used by the **Marine Coordinator** when briefing other members of staff.	
STEP	**NOTES**
Specify Safety Hazards	
Extent of Problem Size of spillage, type of oil, source	
Slick Trajectory Tide and Wind conditions	
Response Actions Strategies to consider	
Resource Mobilisation Equipment and personnel	
Planning Cycle Meetings schedule	
Additional Information Communications, Waste Disposal, Weather Forecast	

8.5 Dispersant Application

8.5.1 Prior to dispersant application, the information in Table 8.1 below is required to be submitted to Marine Scotland, unless there are force majeure circumstances where there is a genuine risk to human life or to the safety of an installation or vessel. Under such circumstances, dispersants may be used without prior agreement.

8.5.2 This information should be completed by the Primary Responder following discussion with an external oil spill response organisation.

Table 8.1 - Information required if seeking advice or prior approval on dispersant use

MARINE SCOTLAND email: spillresponse@marlab.ac.uk; fax number: 01224 295524	
Installation / spill information	
Name and contact details for person requesting approval / advice:	
Name of Responsible Person:	
Name of site:	
Location of spill (in degrees of Latitude and Longitude):	
Oil type or description of appearance if not known. If crude oil, state type:	
Volume of oil spilled – preferably in tonnes:	
Source of oil spill:	
Potential for further spillage:	
Description of slick – including dimensions and colour:	
Dispersant use information	
Dispersant type(s):	
Dispersant proprietary name(s):	
Marine Scotland approval status:	
Quantity / quantities proposed for use:	
Method(s) of application:	
Have efficacy tests been undertaken to confirm hydrocarbons are amenable to treatment (e.g. bottle tests / test sprays)? If so, what were the results?	
Location(s) of application:	
Water depth (m) in application area(s):	
Minimum distance (km) from nearest shoreline:	
Minimum distance (km) from nearest median line:	
Environmental sensitivities relevant to location(s) of application (including any protected sites within 20 km):	
Prevailing weather conditions: • Wind speed • Wind direction • Wave height	
Other methods of response being applied or considered and assistance being sought (e.g. oil spill response contractor):	

8.5.3 The information in Table 8.2 below is required to be submitted to Marine Scotland after the use of dispersant (adapted from DECC, 2015).

Table 8.2 - Information to be recorded when using dispersant

MARINE SCOTLAND email: spillresponse@marlab.ac.uk, **fax number:** 01224 295524	
Installation information	
Name of operator:	
Name of site:	
Location (in degrees of Latitude and Longitude):	
Dispersant use information	
Date:	
Dispersant proprietary name(s):	
Quantity / quantities used:	
Method(s) of application:	
Location(s) of application:	
Prevailing weather conditions at time of use: • Wind speed • Wind direction • Wave height	
Reason for use:	
Was approval or advice obtained prior to use?	
Estimate quantity of oil treated:	
Comments on effectiveness of treatment:	
Other relevant observations / comments on use:	
Name and contact details for person reporting use:	
Date and time report was completed:	

9 References

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Appendix A: MPCP Legislation Register

Legislation	Relevance to BOWL	Summary	Regulatory Body
Waste and Discharges			
Offshore Chemical Regulations 2002 (as amended)	Control of Chemical Usage	Provides a mandatory control system for the use and discharge of chemicals by the offshore oil and gas industry. Under the terms of the Wind Farm Marine Licence and the OfTW Marine Licence (condition 3.1.7) the Offshore Chemical Regulations should be followed during construction works with utilised chemicals selected from the List of Notified Chemicals.	DECC, Marine Scotland
Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008	Sewage and Garbage treatment, storage and disposal	Implement both the revised Annex IV of MARPOL 73/78 – Regulations for the Prevention of Pollution by Sewage from Ships, and the Annex V of MARPOL 73/78 (including amendments) – Regulations for the Prevention of Pollution by Garbage from Ships. Implements into UK law international regulations on treatment and disposal of garbage and food waste from vessels operating in UK water. All ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons must carry a Garbage Management Plan and a Garbage Record Book. The regulations also provide powers for the MCA to issue an International Sewage Pollution Prevention Certificate to ships in the same categories.	MCA
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004	Ballast water management	Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens though control and management of ships' ballast water and sediments. Under this regulation, all ships in the UK are required to have a Ballast Water Exchange Management Plan and a Ballast Water Record Book and to be surveyed and issued with an International Ballast Water Management Certificate.	MCA
The Merchant Shipping (Anti-Fouling Systems) Regulations 2009	Anti-fouling Pollution prevention	Prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems and places into UK law Regulation (EC) 782/2003 on the prohibition of organotin compounds on ships. Provides powers for the MCA to issue an	MCA

Legislation	Relevance to BOWL	Summary	Regulatory Body
		International Anti-fouling System Certificate to ships of 400 gross tonnage or above and ships of less than 400 gross tonnage with a length of greater than 24 metres.	
The Marine (Scotland) Act 2010 (in respect of Scottish territorial waters) and the Marine and Coastal Access Act 2009 (in respect of the offshore area)	Deposition of substances	These Acts provide that a licence must be obtained for the deposition of any substance or object (including waste), either in the sea or on or under the sea bed.	Marine Scotland
Control of Substances Hazardous to Health Regulations 1994 COSHH	Control of substances hazardous to health	Assessment, prevention or control of exposure and monitoring of substances hazardous to health.	HSE
The REACH Enforcement Regulations 2008 (as amended)	Chemical usage	These enforce Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) which require chemical users to demonstrate the safe manufacture of chemicals and their safe use throughout the supply chain. Under REACH, the users of chemicals as well as their manufacturers and importers have a responsibility to ensure that the risks to both human health and the environment are adequately assessed.	DECC, Marine Scotland
The Classification, Labelling and Packaging (CLP) Regulations 2009	Chemical Usage	The CLP Regulation adopts the United Nations' Globally Harmonised System on the classification and labelling of chemicals (GHS) across all European Union countries, including the UK.	HSE
Pollution Control			
Merchant Shipping Act	Prevention of pollution	The Merchant Shipping Act 1995 provides the framework for regulation of ship-source	MCA

Legislation	Relevance to BOWL	Summary	Regulatory Body
1995		pollution.	
The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996 (as amended)	Prevention of oil pollution	These Regulations give effect to Annex I of MARPOL 73/78 (prevention of oil pollution) in UK waters. They address oily drainage from machinery spaces on vessels and installations and sets limits for the levels of oil in discharged water from these sources. Vessels and installations are required to hold a valid Oil Pollution Prevention Certificate. Vessels are also required to hold a current, approved Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with guidelines issued by the International Maritime Organisation (IMO). Oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above are required carry an Oil Record Book to record when specific operations take place on board which have the potential to lead to oil pollution from vessels and an approved Shipboard Oil Pollution Emergency Plan (SOPEP).	DECC, Marine Scotland, MCA
Bonn Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances (1983)	Prevention of oil pollution Pollution protection	An agreement to combat oil pollution and to stimulate active cooperation and mutual assistance among states bordering the North Sea in case of casualties or other incidents at sea that are of great concern for the protection of the coasts and related interests.	DECC, Marine Scotland, MCA
Marine Management Organisation (MMO) (2016) Approved oil spill treatment products	Oil spill response	Quick reference list of products approved for use on the UK Continental Shelf	MMO, Marine Scotland
Marine Safety Agency (MSA) (1996) Merchant Shipping Notice No. M.1663, Vessels Engaged in Oil	Oil spill response	Provides guidelines for the design, construction, ship's equipment and operation of offshore support vessels, which may be required to have the capability of handling, storing and transporting oil recovered from a spill in emergency situations.	MSA

Legislation	Relevance to BOWL	Summary	Regulatory Body
Recovery			
The Merchant Shipping (Ship-To-Ship Transfers) Regulations 2010 (as amended)	Refuelling operations Cargo transfers	Bring in controls on ship-to-ship transfers in UK waters, including prohibiting ship-to-ship transfers and bunkering operations outside harbour authority waters and put in place a legislative regime for assessing and licensing harbour authorities which propose to allow ship-to-ship transfers in their waters. Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended). An exemption is provided in MSN 1829 for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling.	MCA
The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998 (OPRC Regulations) (as amended)	Oil spill	The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998 introduce into UK law the oil spill planning requirements and legal oil spill reporting requirements of the OPRC Convention.	DECC, Marine Scotland, MCA
The Merchant Shipping (ISM Code) Regulations 2014	Pollution prevention	Provides for the application of the ISM Code on all vessels to which the SOLAS Convention applies and to other vessels to which EC regulations apply. The ISM Code provides an international standard for the safe management and operation of ships and for pollution prevention.	MCA
The Merchant Shipping (Dangerous or Noxious Liquid Substances in Bulk) Regulations 1996	Chemical transportation	These Regulations contain restrictions on all ships carrying in bulk noxious liquid substances or unassessed liquid substances.	MCA
Merchant	Pollution	These regulations contain requirements in	MCA

Legislation	Relevance to BOWL	Summary	Regulatory Body
Shipping (Reporting Requirements for Ships Carrying Dangerous or Polluting Goods) Regulations 1995/2498 (as amended, 2204/SI 2110 and 2005/SI1092)	response	connection with reporting requirements for discharges, during the operation of a ship, of oil or noxious liquid	
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997/2367	Pollution prevention	Regulations apply to ships carrying dangerous goods in bulk or packaged form or marine pollutants in packaged form.	MCA
Merchant Shipping (Prevention of Pollution: Substances Other than Oil) (Intervention) Order 1997/1869	Pollution prevention	These regulations list the substances other than oil to which the restrictions contained in the Merchant Shipping Act 1995 apply. Also see MGN 37 (M) for guidance on the application of this legislation.	MCA

Appendix B: Legal Framework and Government Responsibilities

Government Responsibilities

A number of UK government organisations have responsibilities for oil spill prevention, planning and response. Figure B.1 summarises the key government bodies and their offshore jurisdiction.

Figure B.1 - Government organisations and corresponding offshore jurisdiction

Government Organisation	Role	Offshore Jurisdiction (nautical miles)				
		1	3	6	12	200
Department for Transport (DfT) Maritime & Coastguard Agency (MCA) – HM Coastguard (HMCG)	Responsible for: • Government response to an oil spill anywhere around the UK coast; • Providing assistance to local councils responsible for shoreline clean-up (discharges this responsibility through MCA). Responsible for the co-ordination of all civil maritime search and rescue operations in the UK. In the event of a spill, the HMCG will be contacted in the first instance and will then liaise with the MCA department and others as necessary.					→
MCA - Counter Pollution & Response Branch (CPRB)	Responsible for the National Contingency Plan (NCP) and oversees the actions of those responsible for salvage and clean-up operations.					→
Marine Scotland (MS) - Marine and Fisheries	MS are responsible for approving the use of dispersants or other oil treatment products in UK waters. MS has a wider responsibility for protecting fisheries and the marine environment, with assistance from the MS – Marine Laboratory (ML) and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Local fisheries concerns are handled by the MS Fish Health Inspectorate (FHI).					→
Joint Nature Conservation Committee (JNCC) Scottish Natural Heritage (SNH)	Government's statutory advisors on wildlife affairs and nature conservation. The organisation responsible for providing advice on the environmental sensitivities during a pollution incident. They are the official agencies to be consulted by the local authorities and operators at the planning stage and prior to any oil spill clean-up operation.				→	→
Scottish Environment Protection Agency (SEPA)	Responsible for water quality up to three nautical miles offshore and fisheries up to six nautical miles offshore.	→	→	→		
Local Authority (LA)	Responsible for clean-up of beached oil in their authorities. The area pollution officer is responsible for drawing up a local contingency plan for inshore and onshore clearance and for co-ordinating a local response for oil spill clean-up operations. They would require the mobilisation of a Shoreline Response Centre (SRC) that both the MCA and operator representatives would attend.	→				

Interfaces with National Contingency Plan and Others

National Contingency Plan (NCP)

Introduction

The National Contingency Plan (NCP) for Marine Pollution from Shipping and Offshore Installations has been developed by the UK Government and sets out the arrangements at a national level for dealing with spillage of oil or other hazardous materials at sea in UK waters. The NCP is designed for incidents of national significance which, in most cases, would be classified as large Tier 2 or Tier 3 pollution incidents. The plan involves a great number of organisations from central and local Government and private industry.

Activation of the NCP

Note that the activation of the NCP is not the responsibility of an Offshore Operator. Activation of the NCP is the responsibility of the MCA. It should also be noted that the activation of the NCP in response to an oil spill from the Development is extremely unlikely, and therefore this section is mainly provided for information purposes.

If a significant oil spill from a vessel or offshore installation occurred, the primary responder would report the incident to the nearest MCA Coastguard Marine Rescue Co-ordination Centre (MRCC) by telephone in the first instance. The MRCC would then contact the vessel or offshore installation to ascertain various details on the incident.

The MRCC then initiates any search and rescue response that may be required. The MRCC would then report any pollution incident, or a risk of significant pollution, to the MCA duty Counter Pollution and Salvage Officer (CPSO), with a copy to the MCA Headquarters and the Marine Accident Investigation Branch (MAIB), both based in Southampton.

When the MCA duty CPSO is notified of an incident, the CPSO decides if a regional or national response is warranted. It should be noted that the NCP lays down no rigid criteria for triggering a regional or national response. This is left to the discretion of the MCA duty CPSO.

In the event that a regional or national response is activated, the MCA may deploy several response Units. In reality, these Units, if deployed, will act to work with and support the Operator's (i.e. BOWLs) spill response actions.

Further details on the MCA NCP can be found online at: <https://www.gov.uk/government/publications/national-contingency-planncp#history>.

The Bonn Agreement

The Bonn Agreement, which entered into force in1983 (and was subsequently amended in 1989, 1994 and 2001), is the mechanism by which the North Sea States and the European Community (the Contracting Parties), work together to:

- Help each other in combating pollution in the North Sea Area from maritime disasters and chronic pollution from ships and offshore installations;
- Carry out surveillance as an aid to detecting and combating pollution at sea.

The Bonn Agreement is the major counter-pollution interstate agreement for northern Europe. The North Sea States party to the Bonn Agreement are:

- Belgium;
- Denmark;
- France;
- Germany;
- Ireland;
- The Netherlands;
- Norway;
- Sweden;
- United Kingdom of Great Britain and Northern Ireland.

The Bonn Agreement sets out command and control procedures for pollution incidents likely to affect participating parties, as well as channels of communication and resources available. It sets out the mechanism by which North Sea States, and the European Community, will work together to combat pollution in the North Sea area from maritime disasters, chronic pollution from ships and offshore installations and recommends the command structure and operational co-ordination between the parties. The Agreement is largely oriented towards major spills; however, it is not confined to such events and will apply as necessary to any spills within the Bonn regions, which are of sufficient severity to warrant joint action.

In the event of an oil spill entering any waters of Member States other than those of the origination state, it may be necessary to implement the Bonn Agreement. The Bonn Agreement becomes operational when agreement to the request for its implementation is reached. Responsibility for implementing joint action rests with the Action Co-ordinating Authority (ACA) of the State on whose side of the median line a spill originated.

The experience gained through the Bonn Agreement has been codified in the Bonn Agreement Counter-Pollution Manual. This sets out:

- Agreed General Strategy;
- Specific Policies agreed on many issues;
- Agreed approaches on Response operations;

- Arrangements for joint Exercises;
- Agreed arrangements for Reporting;
- Agreed approaches on Surveillance of oil spills.

The Bonn Agreement Counter Pollution Manual is available online at: < http://www.bonnagreement.org/manuals >.

Industry Plans

The Beatrice MPCP interfaces with the following industry standard plans, as appropriate for the planned operations:

- Shipboard Oil Pollution Emergency Plans (SOPEPs)/equivalent vessel-specific spill plan for each vessel;
- Port and Harbour Oil Spill Contingency Plans (OSCPs); and
- Bridging / interface documents between BOWL and its third party contractors.

Other installations must be notified in the event of a spill. Other installations in the vicinity of the BOWL Development include the Beatrice and Jacky platforms and the two Beatrice demonstrator turbines. In addition, the consented MORL development is located adjacent to the BOWL Development.

The interaction of these plans in relation to potential oil spill size is shown in Figure B.2.

Figure B.2 - Interaction of contingency plans

<table>
<tr><td colspan="3">INCREASING SIZE OF SPILL AND POTENTIAL CONSEQUENCES →</td></tr>
<tr><td>Tier 1 Spill</td><td>Tier 2 Spill</td><td>Tier 3 Spill</td></tr>
<tr><td colspan="3">BOWL MPCP in force for the life of the Development.</td></tr>
<tr><td colspan="3">Shipboard Oil Pollution Emergency Plan (SOPEP) (or equivalent vessel-specific spill plan) carried by each contracted vessel and in force prior to and following the time the vessel is deployed on location. BOWL MPCP is in force for the duration of operations on location.</td></tr>
<tr><td colspan="3">Port and Harbour oil spill contingency plans.</td></tr>
<tr><td colspan="3">Beatrice and Jacky oil spill contingency plans.</td></tr>
<tr><td colspan="3">Beatrice demonstrator turbines oil spill contingency plan.</td></tr>
<tr><td colspan="3">MORL MPCP.</td></tr>
<tr><td></td><td colspan="2">Local Authorities (LA) Plan (in the event that an oil spill reaches 1 mile from the shore).</td></tr>
<tr><td></td><td colspan="2">National Contingency Plan (NCP) provides for the monitoring of all offshore oil spill incidents and Operator’s response actions.</td></tr>
</table>

Appendix C: Response Strategy Guidelines

Response Strategy Guidelines

This guide provides supporting information to personnel involved in planning and executing oil spill response for BOWL's offshore operations.

This guide gives information on each type of response strategy available in the event of a spill at sea and provides details on factors affecting selection and deployment of response.

The response strategy adopted will depend upon the spill details and the prevailing environmental conditions. The essential information required as a basis for decision making is:

- Size and status of the oil spill (e.g. controlled or uncontrolled);
- Location of the oil slick;
- Type of oil and its characteristics;
- Meteorological information, current and predicted weather and sea state;
- Authorities informed;
- Action taken; and
- Evidence gathered, e.g. samples and photographs.

More information will be required as the situation develops, for example as a part of the monitoring process, a survey of the location of seabirds might be carried out to determine the advisability of using dispersants. Aerial surveillance and monitoring will also form an integral part of the response, for example in the case of a large oil spill where dispersant is being used.

Options Available

The response strategies available to BOWL are outlined below:

- **Main Strategies** (strategies expected to be adopted in the majority of oil spills):
  - Monitor and Evaluate;
  - Natural dispersion – maintain the spill under observation but with no active intervention;
- **Alternative Strategies** (alternative strategies in the unlikely event of a larger oil spill, that would require the appointment of a spill response contractor):
  - Chemical dispersion;
  - Mechanical containment and recovery; and
  - Onshore clean-up.

The appropriate response will depend not only on the potential limitations of each of the possible response options, but also on the type of oil spilled and the environmental sensitivities that are threatened by the spill.

Monitor & Evaluate

Monitor and evaluate is the primary response strategy for oil spills that pose no significant threat to the coastline or sensitive resources, as the normally high energy conditions offshore on the UKCS will naturally break up the oil spill. It is recognised that it is essential to monitor an oil spill until complete dispersion. Where surveillance from a vessel is insufficient, aerial surveillance should be undertaken.

All oil spills must be monitored until they have completely dispersed. During operations, small spills in close proximity to installations can be monitored by using a small vessel.

Aerial Surveillance

In the event of a large oil spill, aerial surveillance is the method of choice for observation. Height allows visibility over a wide area, and combined with the high speed of aircraft, allows a large area to be covered and the 'big picture' to be seen. Aerial observation allows response units to be co-ordinated and directed to great effect and allows detection of environmental sensitivities in the path of the oil slick in 'real time'.

An aerial surveillance capability would be available to the primary responder by the appointment of a spill response contractor. However, it should be noted that it is highly unlikely that any spill from the Development would be of a large enough volume to warrant such action. In the majority of cases, monitoring of the slick from an attending vessel will be sufficient.

In the unlikely event of a significant spill where aerial surveillance is mobilised, the slick should be monitored at least twice daily until fully dispersed. The observations of the surveillance must be passed daily to the interested government bodies until the response is stood down. This would be Marine Scotland and Scottish Natural Heritage.

Guidelines for Detection, Investigation & Post flight Analysis/Evaluation for Oil Spill Volume Estimation

This section is based upon the internationally recognised Bonn Agreement Oil Appearance Code (BAOAC) 2004, used for oil spill volume estimation during aerial surveillance.

Detection & Investigation

For aerial surveillance, the main detection equipment is visual look out and radar. Most marine pollution aircraft have Side Looking Airborne Radar (SLAR).

Following the detection, the slick should be thoroughly investigated using the vertical remote sensing instruments; Infra-red (IR), Ultraviolet (UV) and Vertical Camera. The aircraft should be flown directly over the oil to enable the 'plan' view (the most accurate view) of the slick to be recorded.

It is suggested that the aircraft is flown at a height that allows as much of the slick as possible to fall within the field of view of the vertical sensors. In general terms it is

understood that most IR sensors have a field of view of 1,000 feet when the aircraft is at 1,000 feet; so if the line of oil is considered to be 2,000 feet wide, to ensure that all the oil is scanned an aircraft height of 3,000 feet is suggested. It may be necessary to 'map' large slicks.

Visual observation of the pollution on the water's surface provides essential information about the size, appearance and coverage of the slick that are used to calculate the initial estimate of volume. Slicks can be seen some distance 'down current' of the pollution source due to the effect of winds and water currents.

Photographs of the oil slick are probably the most easily understood data for a non-technical person. It is therefore essential to produce a complete set of pictures showing the spill. An ideal set of photographs will show an overall, long range view of the pollution and the pollution source and a series of detailed, close up shots.

It is recommended that the slick should be viewed from all sides by flying a racetrack pattern around the oil. The best position to view the oil is considered to be with the sun behind the observer and the observer looking at the object / subject from an angle of 40° to 45°.

Volume Estimation – Overall Area Measurement

Trials have shown that both overall area and specific oil appearance area coverage measurement is the main source of error in volume estimation. Therefore observers should take particular care during this part of the volume estimation process. Only experienced observers should undertake volume estimation and the same observer should undertake subsequent estimations to determine whether the slick is increasing or decreasing. Caution should be used when applying the estimations during spill response planning as estimations of oil can often be an order of magnitude out and so response tactics should take this into consideration.

The recommended procedure for visual observation is to estimate the length and width of the slick by making time and speed calculations. This forms an imaginary rectangle that encloses the slick. The coverage of the oil slick (expressed as a percentage or proportion) within this imaginary rectangle is then used to calculate the overall area of the slick. Inevitable inaccuracies in dimension estimates and estimated coverage within these dimensions can give rise to high levels of error in area estimation.

Oil slicks frequently contain 'holes' of clear water within the main body of the slick, especially near the trailing edge of the slick. The proportion of the overall area that is covered by oil of any thickness needs to be estimated. For compact slicks, this proportion may be high at around 90% or more, but for more diffuse oil slicks a much lower proportion of the overall area will be covered in oil. More accurate assessments of overall slick area can be made by a more thorough analysis of the SLAR or UV images. The visual and SLAR overall area calculations should be 'adjusted' to take into account the 'holes' (areas) of clear water within the main body of the slick, resulting in an 'adjusted' overall area covered with oil.

Bonn Agreement Volume Estimation

The BAOAC (2004) is an internationally recognised standard used for oil spill volume estimation on water during aerial surveillance. When oil is spilled on water, it spreads out to varying thicknesses. The thickness of the oil is strongly related to how it absorbs, transmits and reflects visible light. The Bonn Agreement oil estimation method works on the principle of estimating the oil thickness (and therefore volume), in relation to the appearance of the oil to the aerial surveillance observer.

Description of the Oil Appearance Codes

The oil appearance codes are described below and summarised in Figure C.1.

Code 1 – Sheen (< 0.3 µm thickness)

The very thin films of oil reflect the incoming light slightly better than the surrounding water and can therefore be observed as a silvery or grey sheen. All oils in these thin layers can be observed due to this effect and not the oil colour itself. Oil films below approximately 0.04 µm thickness are invisible. In poor viewing conditions even thicker films may not be observed. Above a certain height or angle of view the observed film may disappear.

Code 2 – Rainbow (0.3 µm – 5.0 µm thickness)

Rainbow oil appearance represents a range of colours, yellow, pink, purple, green, blue, red, copper, orange; this is caused by an optical effect and is independent of oil type. Depending on angle of view and layer thickness, the distinctive colours will be diffuse or very bright.

Oil films with thicknesses near the wavelength of different coloured light, 0.2 µm – 1.5 µm (blue: 400 nm or 0.4 µm, through to red: 700 nm or 0.7 µm) exhibit the most distinct rainbow effect. This effect will occur up to a layer thickness of 5.0 µm. Bad light conditions may cause the colours to appear duller. A level layer of oil in the rainbow region will show different colours through the slick because of the change in angle of view. Therefore if rainbow is present, a range of colours will be visible.

Code 3 – Metallic (5.0µm – 50 µm thickness)

The appearance of the oil in this region cannot be described as a general colour and is oil type dependent. Although a range of colours can be observed, blue, purple, red and green, the apparent colour is not caused by interference of light or by the true colour of the oil. The colours will not be similar to ‘rainbow’. Where a range of colours can be observed within a rainbow area, metallic will appear as a quite homogeneous colour that can be blue, brown, purple or another colour. The ‘metallic’ appearance is the common factor and has been identified as a mirror effect, dependent on light and sky conditions. For example blue can be observed in blue-sky conditions.

Code 4 – Discontinuous True Colours (50 µm – 200 µm)

For oil slicks thicker than 50 µm the true colour will gradually dominate the colour that is observed; Brown oils will appear brown, black oils will appear black. The broken nature of the colour, due to thinner areas within the slick, is described as discontinuous. This is caused by the spreading behaviour under the effects of wind and current.

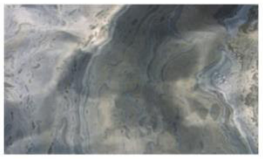
'Discontinuous' should not be mistaken for 'coverage'. Discontinuous implies true colour variations and not non-polluted areas.

Code 5 – True Colours (>200 µm)

The true colour of the specific oil is the dominant effect in this category. A more homogenous colour can be observed with no discontinuity as described in Code 4.

This category is strongly oil type dependent and colours may be more diffuse in overcast conditions.

Figure C.1 - Thickness bands for allocation appearance in accordance with the Bonn Agreement Oil Appearance Code (Lewis, 2007)

		Description Appearance	Layer Thickness Range	Litres per km^2
CODE 1		Sheen (silvery / grey)	0.04 to 0.30 µm	40 – 300 Lkm^{-2}
CODE 2		Rainbow	0.30 to 5.0 µm	300 – 5,000 Lkm^{-2}
CODE 3		Metallic	5.0 to 50 µm	5,000 – 50,000 Lkm^{-2}
CODE 4		Discontinuous True Oil Colour	50 to 200 µm	50,000 – 200,000 Lkm^{-2}
CODE 5		Continuous True Oil Colour	200 to more than 200 µm	200,000 – more than 200,000 Lkm^{-2}

The oil appearances will tend to follow a pattern. The thinner oils (sheen, rainbow and metallic) will normally be observed at the edges of the thicker oils (discontinuous true colour

and true colour). It would be unusual to observe thick oil without the associated thinner oils; however, this can occur if the oil has aged and/or weathered.

Using the BAOAC to estimate oil volume gives a maximum and minimum quantity (Figure E.1). The appearances described cannot be related to one thickness; they are optic effects (codes 1 – 3) or true colours (codes 4 – 5) that appear over a range of layer thickness. There is no sharp delineation between the different codes; one effect becomes more diffuse as the other strengthens. A certain degree of subjective interpretation is therefore necessary when using the code.

Bonn Agreement Specific Oil Appearance Code Coverage Estimation

During the observation flight, the aircrew should estimate the areas within the overall area that have a specific oil appearance, using a Bonn Agreement Pollution Observation Log. The 'adjusted' overall area covered with oil should be sub-divided into areas that relate to a specific oil appearance.

This part of the volume estimation is very subjective, so great care should be taken in the allocation of coverage to appearance, particularly the appearances that relate to higher thicknesses (discontinuous true colour and true colour). The vertical camera data (if available in flight) and the visual observations can be compared with the IR data, which will give an indication of the thickest part of the slick.

Post Flight Analysis

The aim of post-flight analysis / evaluation is to provide a more accurate estimate of spilled oil volume than can be made within the confines of the aircraft during flight. It is based on measured oil slick areas and the estimated oil layer thickness in various parts of the oil slick using the information gained from the aerial surveillance mission.

Electronic methods or the use of grid overlays should be used to obtain accurate measurements of overall slick area from the recorded images. Where several images have been obtained during a period of time, the area should be calculated for each one.

The photographs and Bonn Appearance Pollution Observation Log from the aircraft should then be re-examined and the proportions of slick area of different BAOAC codes should be re-calculated.

It is particularly important that areas of any thick oil (Codes 4 or 5 in the BAOAC) – if present – be confirmed as accurate or correlated with the thicker areas shown on the IR image, since these will have a very large influence on the estimated volumes.

The final stage of post flight analysis is to calculate the estimated minimum and maximum volume by totalling the volume contributions of the different areas of the slick. The below worksheet can be used for the estimation of oil slick volume during post flight analysis. This also includes a worked example of using the BAOAC.

Worksheet for estimating oil slick volume in accordance with the Bonn Agreement

Step 1. Total area: Estimate total size of the oil slick as a square or rectangle (in km²). [*For example 10x 2 km = 20km²*].

Step 2. Oil Spill Area: Assess the area affected by the slick in km² calculated as a % of the total area. [*For example, the slick affects 90% of the total area, 90% of 20 km² = 18 km²*].

Step 3. Estimate slick area by colour: Estimate the area covered by each oil appearance colour as a % of the area affected in km². [*For example, 60% silvery sheen: 0.60 x 18 = 10.8km², 40% metallic: 0.40 x 18 = 7.2km² respectively*].

Step 4. Calculate minimum and maximum oil quantity by colour: Multiply the area covered by each oil appearance colour by the minimum and maximum possible volumes to get the minimum and maximum estimates of oil quantity. [*For example, silvery sheen; min: 10.8km² x 0.04 = 0.432m³/km², max: 10.8km² x 0.3 = 3.24; metallic; min: 7.2 km² x 5 = 36, max: 7.2 km² x 50 = 360 m³/km²*].

Step 5. Total quantity: Add all the quantity by colour figures to get total estimated minimum and maximum quantities of oil in m³.

Step 6. Conversion: If necessary, covert m³ to tonnes by multiplying total quantity in m³ by the Specific Gravity of the spilt oil.

Average width (km)		Average length (km)	
STEP 1	Total Area (Width x Length) km²		
STEP 2	Oil Spill Area (Estimated) km²		

Colour	Code	Minimum (m³ / km²)	Maximum (m³ / km²)	STEP 3 % of Area Affected	STEP 3 Area Covered km²
Silvery Sheen	1	0.04	0.3		
Rainbow Sheen	2	0.3	5.0		
Metallic	3	5.0	50		
Discontinuous True colour	4	50	200		
Continuous True Colour	5	200	200		

Note: Calculation for Area Covered: Km² = Oil Spill Area / 100 x % of Area Covered.

Colour	STEP 3 Area Covered (km²)	STEP 4 Min Volume (m³)	STEP 4 Max Volume (m³)
Silvery Sheen			
Rainbow Sheen			
Metallic			
Discontinuous True Colour			
Continuous True Colour			

STEP 5	Total Volume (m³)		
STEP 6	Total Volume in Tonnes (m³ x SG)		

Prediction of Oil Spill Movement

Oil spill movement can be computer modelled to predict the movement and fate of spilled oil and to 'monitor' the slick when not under direct observation. This can be done by the appointment of an oil spill response contractor or consultancy with access to oil spill modelling software.

For this purpose, the following **essential information** is required:

- The date and time of the spill;
- The type of oil;
- Amount of oil;
- Spill location (latitude and longitude);
- Current and forecast weather;
- Air and water temperature (if available) and;
- Location of environmental sensitivities.

The models contain the relevant tidal data and a database of the characteristics of different oils. The output from the model will be a map showing the location of the slick at any desired time and data about the oil indicating the rate of oil dispersion and oil viscosity. This can also indicate the likelihood of the oil being amenable to chemical dispersion.

Predicting Slick Movement Manually

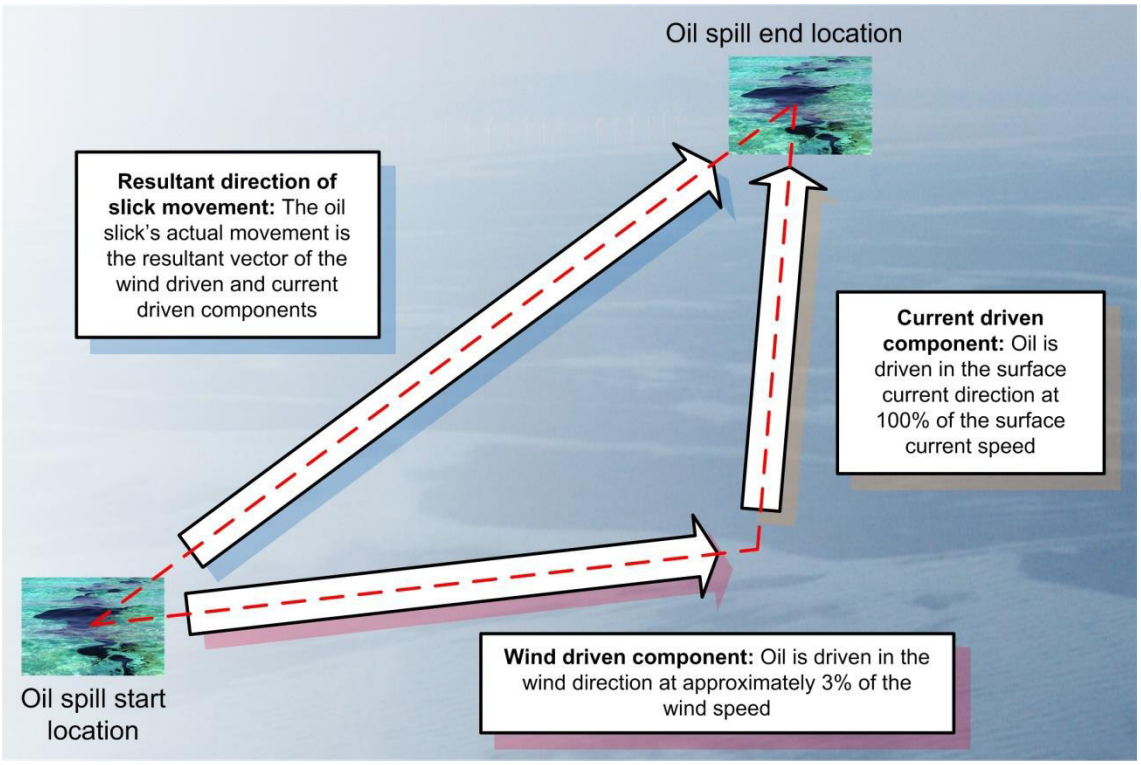
Slick movement can be predicted manually to provide a rough guide to possible direction and speed of slick movement, which may assist in developing an appropriate response strategy. It should not be considered a substitute for visual monitoring of slick movement throughout the oil spill response in the field.

The movement of an oil slick can be estimated based on the surface water current speed and direction, and the wind speed and direction.

Spilled oil moves with 100% of the surface current speed in the direction of the surface current (the current driven component), and with approximately 3% of the wind speed in the direction of the wind (the wind driven component). An important point to note is that current directions are always given in the direction the current is moving to, and wind directions are always given in the direction the wind is blowing from.

Assuming the current driven component and wind driven component are constant, and given the starting position of the oil slick, the resultant movement can be estimated for a given unit of time by using a marine chart and plotting a simple vector diagram (Figure C.2).

Figure C.2 - Plotting spill track



Sampling of Spilled Oil

Where there is doubt about the source of a spill, confusion of the identity of the responsible party, or if there appears to be more than one spill; samples of the spilled oil should be taken. The oil samples should then be sent for lab testing and analysis in order to find the likely source of the oil. Advice on the collection and handling of oil samples is summarised below in Table C.1.

Table C.1 - Advice on Collection and Handling of Oil Samples

Sampling Location	Locations should be recorded using grid reference (e.g. latitude/ longitude), including maps, sketches and photographs as appropriate. The date and time of sampling should also be noted.
Sample Collection	*At sea* The simplest sampler is a narrow mouth bottle which can be used to skim the surface of the oil. After the bottle is closed, it can be inverted and the closure opened slightly to drain excess water. The oil can then be decanted into to a clean bottle if necessary. *On shore* Oil deposited on rocks or other impervious materials should be scraped off and placed directly into the sample container. Oil adhering to seaweed, wood, sand, plastic, sand or other debris should be dealt with by placing the complete specimen comprising oil and support material into the sample container where practical. When liquid samples are skimmed off the surface of the sea, care should be taken

<table>
<tr><td></td><td>to ensure that the sample contains sufficient oil. Various techniques may be adopted to skim thin layers of oil from the waters' surface such as using a bucket with a hole.

Care should be taken to minimise contamination of liquid samples by solid matter. Oil deposited on rocks or other impervious materials should be scraped off and placed directly into the sample container. Lumps of tarry or waxy pollutant should be placed directly into sample containers; no attempt should be made to heat or melt these samples to enable them to flow into a container.

Oil adhering to seaweed, small pieces of wood, sand, plastic, material, cloth, vegetation or other debris should be dealt with by placing the complete specimen comprising oil and support material into the sample container.</td></tr>
<tr><td>Sample Quantities</td><td>An oil sample should be as large as is reasonably practical. The minimum amounts needed for full chemical analysis are as follows. Note that smaller quantities may still have value as limited analyses may still be possible:

<table><tr><td>Un-weathered oils that are liquid and substantially free of water</td><td>10 ml.</td></tr><tr><td>Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"</td><td>100 ml.</td></tr><tr><td>Overside water discharge where contravention of 100ppm or 15ppm is suspected</td><td>1000 ml. of the discharge</td></tr><tr><td>Tarry lumps as found on beaches</td><td>50 g.</td></tr></table>
Three samples should be taken:

Sample 1 Sent to certified laboratories for appropriate chemical analyses;

Sample 2 Given to Authorities if requested;

Sample 3 Retained in storage for reference.</td></tr>
<tr><td>Bottling, Sealing, Packaging and Boxing of Samples</td><td>All samples should be securely packed and sealed, using screw topped containers and UN approved fibreboard boxes to ensure safe carriage of the samples. As proof against unauthorised opening, the sample container should be sealed with adhesive labels with a signature on the paper, stuck on the bottle top in such a way that they have to be broken to open the bottle.

The bottle should then be placed inside a plastic bag, which should be sealed with a further adhesive label in the same way as for the sample bottle to ensure that it is not tampered with.

If it is necessary to take an oil sample where one of the standard containers above is not available, the receptacle should be of glass construction with a screw-cover and a seal which would not be affected by the oil. Small (100ml) and medium (500ml) glass bottles are readily obtainable from chemists or hardware shops.

The use of closed metal receptacles or plastic jars is strongly discouraged as oil contact with metal or plastic can, in some cases, interfere with the analysis. Avoid the use of any metal tool made of nickel or vanadium based alloys, as these metals occur naturally in crude oils and refined products and their levels may assist in the identification of the oil source.

When boxing the sealed samples for transport, Dangerous Goods packing</td></tr>
</table>

	instructions (in accordance with IMDG/ ADR/ SI 1573) should be followed, to ensure the integrity of the package for transport under Dangerous Goods conditions. A suitable material should be used to surround the sample(s) in the box for added protection and to absorb any possible seepage. Make sure that the dangerous goods documentation is completed. Whenever possible, samples should be stored in refrigerators or cold rooms at less than 5 ^{o}C in the dark. These precautions are particularly important for samples containing water or sediment, but less so for bulk oil samples.
Labelling and Addressing of Samples	Care should be taken to ensure that every sample bottle is not only suitably sealed but also clearly labelled before being submitted to the laboratory. It is important that a sample is positively identified, particularly where more than one is taken during an incident. It is of vital importance to maintain continuity in the chain of evidence. MCA recommend that each sample is labelled and is accompanied by more detailed information set out on a standard pro-forma. The form accompanying each container should therefore provide the following details: – An identifying number, with the date of the sample taken and the name of the official in charge of sampling; – Description of samples; – Location from which sample was taken, grid reference if possible; – Date and time of sampling; – Purpose for which sample was taken; – If known, suspected source, e.g. name of tanker or ship; – Whether or not dispersants have been used and, if known, their type and make; – Method of sampling (description of sampling device); – Name, address and telephone no. of person taking the samples and of anyone witnessing the taking of it. – If possible the following information would also be helpful: – Wind direction and velocity; – Air and water temperature; – Sample descriptions, i.e. viscosity, colour, odour and contaminants; – Description of the oil spill, i.e. distribution and consistency. To assist with any subsequent investigations, it is important that a letter is sent to MCA quite independently of the sample (but a copy should be sent with the samples), setting out the above listed details.
Transportation of Samples	Ensure that the samples are labelled correctly and securely packed in UN approved boxes to avoid breakage. It is important that the standard pro-forma described above should also be included with the sample along with all carriage documentation. To facilitate sample transportation, clear information on the number of samples in the consignment, the location they need to be collected from and a contact name and phone number need to be given to the MCA Counter Pollution Branch.
Handling of Sample for Bonn Agreement	In cases where samples are taken at the request of a contracting member of the Bonn Agreement, the MCA Counter Pollution Branch would be the focal point for processing the samples for either analysis or onward transmission to the requesting member state. The results of such tests would not be made public until the

States	contracting party involved was informed.

Natural Dispersion

If the oil slick does not immediately threaten any sensitivity or resource and prediction methods show that the oil will disperse by itself, then the valid response strategy is to monitor the oil slick until it disperses naturally.

This is the preferred response strategy for spills from the Development. According to the results of the risk assessment presented above in PART 1 the most likely oil spills associated with the Development are of a light non-persistent type and of relatively low volume. Therefore, allowing natural dispersion, in conjunction with continued monitoring and evaluation, would be the most appropriate response strategy in most cases.

The future movement and behaviour of the oil should be predicted, as far as possible, using weather forecasts and computer modelling until it has completely dispersed. This would be available through an oil spill response contractor, or other consultancy with access to oil spill computer modelling software. Oil on the sea surface should be monitored by direct observation.

Natural dispersion relies solely on the various weathering processes and their overall contribution to oil slick removal (Table C.2).

Table C.2 - Fate of spilled oil in the marine environment –natural dispersion processes

Weathering Agent	Description	Rate and contribution to slick removal	DIESEL	IFO
Spreading	Oil will tend to spread out on the surface of the water. The rate and degree to which it does will depend upon the viscosity of the oil and the surface tension between the oil and the water. The higher the temperature, the lower the viscosity and the greater the degree and speed of spreading. Under the influence of wind the oil will become unevenly distributed. It will tend to break up into patches or ribbons, thickest in the leading edge and thinnest at the trailing edge.	Rapid cover of large areas.	Very rapid spreading	Rapid spreading
Evaporation	Evaporation will remove the more volatile molecules from the surface of the oil slick into the atmosphere. It will act fastest when there is a large surface area of oil exposed to the air and will increase with temperature. It will be more predominant when the proportion of lighter to heavier molecules in the oil is high and the energy in the sea and atmosphere is high (rough conditions).	Rapid, particularly for lighter oils. It may account for 10 – 75% of removal of oil from the sea surface depending upon the initial type.	Major means of removal	Initially dominant means of removal
Dissolution	The soluble elements of the oil (the lighter molecules) will preferentially be removed from the slick into the water column and they will subsequently be diluted by dispersion. Aided by high energy in the sea.	Active soon after a spill occurs, but overall it is a relatively minor pathway.	Can be important	Can be important
Dispersion	The oil layer on the surface of the sea is broken into small droplets which then disperse into the water column. The rate at which this occurs and the degree to which it occurs will depend upon the composition of the oil. Aided by high energy in the sea.	An important process for removing oil from the surface and facilitating bio-degradation. Most important for the less viscous oils.	Important	Important
Photolysis	Light energy acting upon oil breaks chemical bonds in the hydrocarbon chains and allows it to slowly oxidise. Aided by high levels of irradiation.	Negligible over the short term in high northern latitudes however important in the long term and lower latitudes.	Important	Important
Bio-degradation	Biodegradation is the ultimate means of removal of free oil from the environment. Aided by ample nutrient supply, dispersion of oil, moderate temperatures, and high energy environments.	Minor importance in the short term but very important in the long term.	Not important	Important in long term
Drift	Drift of the oil slick is facilitated by wind, waves and surface water currents.	Important in distributing oil and moving it into or out of sensitive areas.	Can be important	Important

Diesel is a low viscosity distillate fuel made from light gas oil. Typically it has a density of 0.846 kilograms per litre. It contains a high proportion of light ends and so evaporation will play an important part in the removal of the oil from the surface of the sea. Spill evaporation rate will depend on the volume and rate of spill.

Oil can be characterised according to its behaviour in the environment if spilled, according to its ITOPF Group.

Lube and hydraulic oils are refined products. They have no light ends and behave as viscous oil. Evaporation will be limited and spreading relatively slow, however, they are dispersed rapidly by natural wave action.

Chemical Dispersant Application

Chemical dispersants are applied as a spray to floating oil to speed up the break-up of surface oil slicks into small droplets that disperse into the water column.

Due to the light nature of the oils associated with the Development, dispersant application is not likely to be a viable response option, as it will provide little additional environmental benefit. However, in the unlikely event of a large spill of more persistent oil such as IFO, dispersant application may be considered if the oil is not observed to be dispersing naturally.

Some oil types may be resistant to dispersant application therefore the amenability of the oil to dispersion should be tested by shaking a sample of oil and water in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample demonstrates effective dispersion in this test.

Dispersant Use Guidelines

The MMO and Marine Scotland - Marine Laboratory (MS-ML) have issued the following guidance on dispersant use (*Annex 4 PON1 Guidance, 22nd March 2011*). The full guidance document can be found online at <https://www.gov.uk/oil-and-gas-petroleum-operations-notices>.

Shallow Water

As indicated in DECC's PON1 guidance, the approval of the Licensing Authority must be obtained prior to any use of dispersants or other oil treatment products in an area of sea which is less than 20 metres deep or within 1 nautical mile of any such area. **Formal approval for dispersant use from Marine Scotland will be required in water depths of less than 20 metres or within 1 NM of such depths.**

It is not sufficient to consult or advise after use – in law, **Marine Scotland approval must be received before such products are used in such shallow water**. The only exception is *force majeure* circumstances where it is necessary to use dispersants to protect the installation, vessels, or personnel who are at risk from the release (*DECC, 2011*).

Deep Water (i.e. at least 1 nautical mile outwards from the 20 metre contour)

DECC's PON1 notice states that "It is the policy of the Licensing Authorities that they should be consulted in advance on all proposals to use oil dispersants, except in circumstances where a release poses an immediate threat to human health or the safety of an installation." MMO therefore request to be consulted before dispersants are used unless there are force majeure circumstances (DECC, 2011).

Force Majeure

In the event of a force majeure situation dispersant may be used without prior approval or consultation if there is an imminent risk to human life.

Spills of Gasoline, Kerosene and Diesel

The general view of the MMO is that chemical dispersants should **not** be used on released gas oil or diesel fuel, for two reasons. Firstly, the natural processes of evaporation and dispersion will usually rapidly remove these oils from the sea surface without the need for chemical treatment. Secondly, chemical dispersion of these light oils will result in increased concentrations of toxic components within the upper water column.

Sometimes it is suggested that chemical dispersion of diesel, which is observed not to be dispersing naturally, might be necessary in order to protect seabirds. It is agreed that this may be an appropriate response, but, as always, it is a question of balancing one outcome against another. Many spawning species have pelagic eggs and/or larvae which are vulnerable to oil which is chemically dispersed into the water column. Inevitably, they would become exposed to higher oil concentrations if dispersants were used than would be the case if the oil had been allowed to disperse naturally. Static fishing gear would be affected in the same way. **Due to the potential presence of spawning species within the vicinity of the Development at certain times of year, dispersant use is not recommended during these times. Consultation with Marine Scotland should always take place if dispersant use is being considered**.

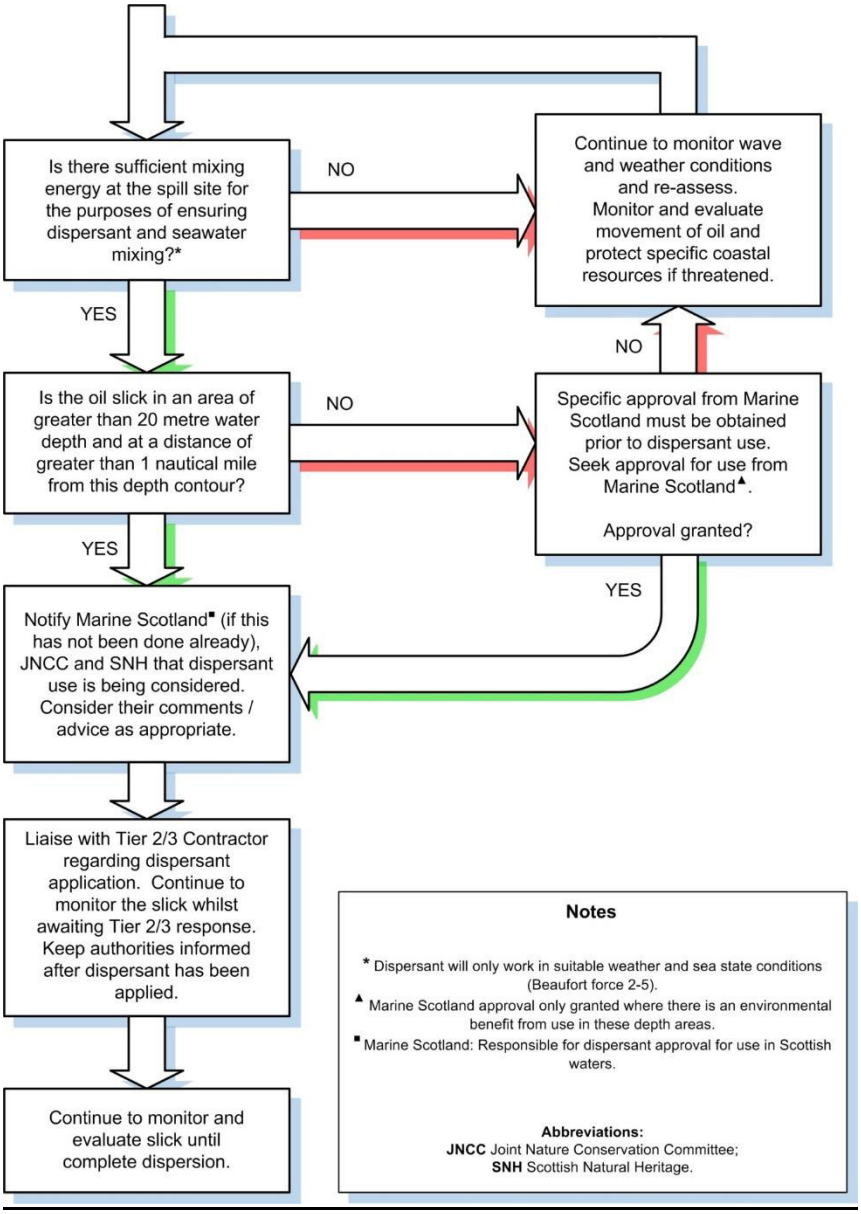
In the unlikely event that any released diesel or IFO does not disperse naturally, chemical dispersion can be considered, but this should only take place with the agreement of Marine Scotland. Figure C-3 provides a decision flow chart which should be consulted when considering the use of dispersant application during spill response. Marine Scotland will seek to respond to any request to use dispersants within 1 hour at the most, and will consult with their own scientific advisors and the relevant Statutory Nature Conservation Body before making a decision. This will ensure that any decision on the use of dispersant is based on the most up-to-date information on both spawning fish populations and seabirds, thereby minimising any potential environmental impact (*DECC, 2011*).

Marine Scotland marine pollution emergency contacts are available on a 24 hour basis as per Annex 3 in the above guidance document.

The full list of approved oil spill treatment products is available on the UK Government website:

https://www.gov.uk/government/publications/approved-oil-spill-treatment-products/approved-oil-spill-treatment-products

Figure C-3. Dispersant use decision chart.



Dispersant Mechanics

Once in the form of small droplets, the surface area of oil open to attack by biodegrading agents is vastly increased. Dispersants work as wetting agents whose molecules are part hydrophilic and part oleophilic. On amenable oils (of viscosity of less than 2,000 centistokes or so) this has the effect of reducing the surface tension in the oil and makes it more amenable to breaking up into small droplets. The hydrophilic nature of the molecules makes the oil droplets more likely to disperse in to the water column and less likely to float. The lowering of the surface tension in the oil also makes it less likely that the oil will form an

emulsion with water. This can reduce the time that oil will take to naturally disperse and can therefore reduce the threat to the environment.

In order to function, the dispersant must be delivered onto the surface of the oil. The oil must then be subjected to a degree of natural or artificial agitation, to break the oil film up. Dispersants must be delivered onto the surface of the oil as droplets, which will mix with the oil for long enough for them to take effect. This can be achieved from surface vessels equipped with a dispersant application system, or by an aerial delivery system, helicopter or by aircraft. Specialist equipment for this function is commercially available for hire (through Tier 2/3 spill response contractors) or direct purchase.

To function effectively, the dispersant must be applied to the oil in the correct ratio of dispersant to oil. Normally the ratio used is 1:20, that is, one volume of dispersant to twenty volumes of oil. However, in practice the ratio chosen will depend upon the technical details of the dispersant being used (manufacturer's recommendations), the amount and type of oil to be dispersed and its state of weathering. It is desirable to use as little dispersant as possible to minimise any possible toxic effects. For example, during the *Sea Empress* incident in the UK in 1996, following close monitoring of the response and its effectiveness, it emerged that the dispersant was effectively dispersing the oil at a ratio of 1:60. This high rate efficacy demonstrates the benefits that can accrue with a combination of favourable environmental conditions and a well conducted operation.

The key points for effective dispersant use are:

- Using dispersant upon an oil on which it is effective;
- Treating freshly spilled, un-weathered oil;
- Accurate targeting of the oil slicks for treatment; and
- Optimal wind speed and sea-state for enhanced dispersion of oil.

Dispersed oil in the water column increases the amount of oil, in droplets, in the first few metres below the sea surface. Sometimes this is visible as a characteristic plume spreading from the surface downwards. Studies have shown that despite the absence of the visible plume there may still be elevated oil concentrations below the surface following the use of dispersants, indicating that they are working. The toxic exposure of marine organisms to this oil has been demonstrated to have an effect at a concentration of more than 10 parts per million of dispersed oil with an exposure time of between two to four hours. Where rapid dilution of the dispersed oil is not possible, then dispersant should not be used, for example in sheltered bays and shallow water. In open water, dilution normally ensures that this toxic concentration is rarely exceeded for any significant length of time.

The relatively high toxicity of dispersed diesel in the water column means that there is no net environmental benefit to be achieved by the use of chemical dispersant upon it. Chemical dispersant would therefore only be used on diesel if life or the installation was threatened by the presence of the diesel oil slick. Dispersant use is therefore subject to certain limitations

imposed by the nature of the oil to be dispersed, the delivery system and the weather conditions (Table C.3).

Table C.3 - Limiting factors for dispersant application

Constraint	Limits	Reference
Visibility (for aircraft delivery)	Daylight hours (visibility > 5 NM)	*IOE 1991, MPCU personal communication*
Wind speed	Beaufort Force 4-5 (22 – 33 knots)	*CONCAWE 1988, IP 1987, Mackay et al. 1986, IOE 1991*
Wave height	0.5-2.5 m	*Kvam 1986, IOE 1991*
Oil viscosity	<2000 mPa	*CONCAWE 1988, IP 1987, MPCU personal communication*

Field Testing Dispersability of Spilled Oil using a Vessel

The amenability of the oil to dispersion should be tested by shaking a sample of oil and seawater in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample is effectively dispersed.

The industry standard dispersability test is described in Table C.4. This test determines the effectiveness of dispersant on the spilled oil. Note that Government Agencies may require a dispersability test prior to giving approval for dispersant use.

Table C.4: Dispersant bottle test

Bottle Test – On Stand-By Vessel – Conduct ASAP	
Step	Action
1	¾ fill a screw top jar with seawater.
2	Add a 25 ml sample of the spilled oil (collected using the slick sampling procedure).
3	Add 2 or 3 drops (ca. 1 ml) of dispersant from the stock (in the spilled oil sampling kit) onto the surface.
4	Screw on the lid and shake the jar.
5	If the oil remains mixed throughout the seawater and does not rise again to the surface, the slick should be amenable to dispersant spraying.
6	Log the result, time and operator and relay the result to the OIM who will report the result to the Emergency Response Team.

Containment & Recovery

Note that for the general UKCS environment, offshore containment and recovery is not considered to be a viable response strategy due to the rough offshore weather conditions that are normally encountered.

However, if a large volume of more persistent oil is spilled and the oil is not dispersing naturally, and the weather offshore is particularly calm, offshore containment and recovery may be a useful response strategy.

Any offshore response procedure will need to take into account local weather conditions. The environment and weather conditions (mainly significant wave height) in the UKCS based on annual weather conditions may be too severe to deploy booms for approximately 75% of the time. Therefore, containment and recovery methods may not be a practical response to offshore oil spills on the UKCS.

Containment and recovery may be a viable response strategy for calmer inshore waters where feasible.

Mechanical containment and recovery is made up of a chain of operations consisting of:

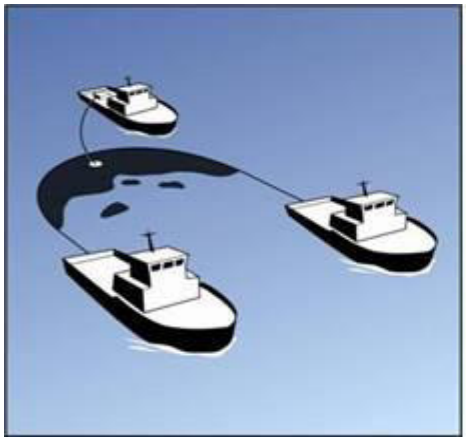
- Containment with some form of boom;
- Mechanical recovery with a skimming device or adsorbent;
- Temporary storage and transport of recovered oil; and
- Treatment, disposal or use of recovered oil.

Mechanical containment of oils involves containing all or part of the oil slick by deploying a boom from the response craft. The boom will form a barrier containing the oil floating on the surface of the water against the tendency of oil to spread and to drift. The boom must be attached at each end to a vessel or anchored. There are a variety of different booms available for use in different circumstances, each being designed, as far as possible, to overcome the problems associated with a particular environment.

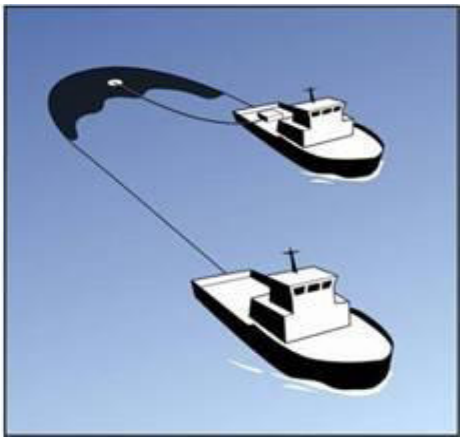
The physical factors limiting the use of booms (Table C.5) are that they cannot be deployed when wind and sea conditions are too rough and they cannot be held against a water current of more than 0.7 metres per second. The boom will fail to hold oil if waves are too high, allowing oil to escape over the top of the boom, or by entrainment if the current is too strong, allowing oil to escape beneath the boom.

Offshore recovery typically requires two or more vessels to which are attached the ends of the boom to hold it stationary or tow it into the wind, in either a U or J configuration (Figure C.4). The oil is recovered using a skimmer deployed by a third vessel, or by the vessel at the ‘base of the J’, where the oil will tend to accumulate at its thickest. There are a variety of different types and models of oil skimmers, each of which will function best in a certain set of conditions (Table C.6). The recovered oil, normally mixed with some water, is then pumped to some form of tank for temporary storage and transport.

Figure C.4 - Offshore recovery boom and vessel 'U' and 'J' configurations (OSRL, 2006)



U configuration – 2 x towing vessels, 1 x recovery vessel



J configuration – 1 x towing vessel, 1 x towing and recovery vessel

The oil must then be transported to shore for final use or disposal. To prevent a recurrence of the pollution the storage location must be robust enough to allow transport ashore for disposal. There are a variety of temporary storage systems available. These must be appropriately rated for the job in hand and must be used within their design limitations. Vessels used for storing oil must be rated according to Merchant Shipping notes M1663 (available online at: <http://www.mcga.gov.uk/c4mca/m.1663.pdf>).

In practice, the amount of oil which is generally recovered at sea through containment and recovery operations is only a small percentage of the amount spilled. This is due to the great physical difficulties of carrying out a difficult operation in an uncontrolled environment and due to the limits of the containment and recovery systems. Acknowledging this, any oil that can be recovered, will reduce the potential for the oil slick to cause damage to the environment and is therefore useful.

Table C.5 - Physical limitations of booms for oil containment

Constraint	Limits	Reference
Visibility	Daylight hours	*IOE, 1991*
Wave Height	< 2.0 metres (conservatively)	*IOE, 1991, Schulze, 1993; BMES/OSR Personal communication*
Water Current	Daylight hours < 0.7m/s (1.35 kts) normal to the boom	*CONCAWE, 1981; Schulze, 1993; OSR Personal communication*

Table C.6 - Physical limitations of skimmers

Skimmer	Type of Oil	Capacity	Weather	Observations
Disc skimmers	All kinds of oil, poor efficiency in emulsions	10-400m^3/h collect 10-60% water with the oil	Claimed up to Beaufort Force 4-5 (1-3 metre waves)	Installed on board ship or a floating unit, best used with booms
Band skimmers	Work in non-viscous oils	10-300m^3/h 10-50% water with the oil	Efficient in calm water, low efficiency in waves	Tow speed is 1-2 knots max. The band can suffer from tearing with the presence of solids and too high towing speed
Vortex skimmers	All oils except viscous oil and emulsion	10-700m^3/h 20-60% of water is recovered	Used with waves up to 1.5 metres	Must be towed by ship or fixed to the boats hull. To be efficient the apparatus must be towed at 1-8 knots.
Skimming barrier	All oils except highly viscous emulsions	100-2,700m^3/day	Efficiency reduces with waves >0.5 metres	Must be towed at speed sufficient to ensure adequate thickness of oil reaches pump

Shoreline Protection & Clean-up

Shoreline Protection and Clean-up is necessary if an oil slick reaches the coastline. It is useful when organising beach clean-up activities to prioritise the most sensitive areas according to their Environmental Sensitivity Index (ESI) that have suitable access and where there is presence of wildlife or other environmental sensitivities that may be at risk of oiling. Also, areas where there is heavy contamination and floating oil should be prioritised to limit further oil mobilisation and contamination.

If oil reaches the coastline, the principal factors to consider during an onshore clean-up operation are:

- Environmental sensitivity of the coastline;
- The length of contaminated coastline;
- The volume of oil to be cleaned up;
- The access route to the areas to be cleaned;
- Good communications and planning;
- A suitable clean-up method for each length of coast; and
- Temporary storage of contaminated materials and liquid oil.

Shorelines have varying degrees of vulnerability to oil spills and the clean-up techniques must be selected accordingly.

Where clean-up or coastal protection is recommended, the following options are available:

- Booms to protect specific areas or to contain oil;
- Skimmers to remove oil from the water near the shoreline;
- Cold/hot water hoses to wash down beaches;
- Dispersant treatment of beached oil at low tide (only with Local Authority and MMO/ MS-ML approval);
- Bioremediation in situ (only with Local Authority and MMO/ MS-ML approval);
- Physical removal of oil and contaminated debris; or
- Natural degradation of oil.

The clean-up option should be chosen in relation to shoreline type (Table C.7). Advice should be sought from experts and conservation agencies and in consultation with relevant Local Authorities and with due regard to the spill response plans of those authorities.

Environmental sensitivities may vary throughout the year and change accordingly. Particular attention needs to be paid to these together with the organisation of beach clean-up teams, temporary storage of oil and debris and access routes to shore. Consideration should also be given to the following:

- The areas where the oil should be left to disperse naturally and monitored (high-energy shorelines);
- The areas or conditions under which the oil should be chemically dispersed;
- The areas where the spill should be recovered mechanically;
- The areas which should be given priority for protection by booms; and
- The location of temporary storage and treatment areas for oiled debris and oily water.

In practice, any inshore clean-up operations will be conducted in close consultation with Local Authorities, to ensure that existing priorities can be met and an effective clean-up operation executed.

Table C.7 - Vulnerability indices for various shoreline types (1 indicates lowest vulnerability and 10 indicates highest vulnerability)

Vulnerability Index	Shoreline type	Comments
1	Exposed rocky shores	Wave reflection keeps most of the oil offshore. High energy wave environment. No cleaning necessary.
2	Eroding wave cut platforms	Wave swept. High energy wave environment. Most oil removed by natural processes within weeks.
3	Fine grained sand beaches	Oil does not usually penetrate far into the sediment, facilitating mechanical removal if necessary. Oil may persist for several months. High/Medium energy wave environment.
4	Coarse grained sand beaches	Oil may sink or may be buried rapidly, making clean-up difficult. High/Medium energy wave environment. Under moderate to high energy (> sea state 4 or 5) conditions the oil will be removed naturally within months from most of the beach face.
5	Exposed compacted tidal flats	Most oil will not adhere to or penetrate into the compacted tidal flat. Medium energy wave environment. Clean-up usually unnecessary – recommend leaving oil to disperse naturally.
6	Mixed sand and gravel	Oil may undergo rapid penetration and burial; under moderate to low energy conditions. Medium/Low energy wave environment. Oil may persist for years.
7	Gravel beaches	As for 6. A solid asphalt pavement may form under heavy oil accumulations.
8	Sheltered rocky coast	Areas of reduced wave action; oil may persist for many years. Low energy wave environment. These areas should receive priority protection by using booms or oil-adsorbent materials.
9	Sheltered tidal flat	Areas of low wave energy and high biological productivity; oil may persist for many years. Low energy wave environment. Clean-up is not recommended unless oil accumulation is very heavy, due to causing more environmental damage by entering the site. These areas should receive priority protection by using booms or oil-adsorbent materials.
10	Salt marsh	Most productive of aquatic environments; oil may persist for many years. Low energy wave environment. These areas should receive priority protection by using booms or oil-adsorbent materials. Seek advice from appropriate conservation organisations.

Appendix D: Contacts Directory

Directory details to be confirmed and inserted prior to commencement of offshore project activity. The Contacts Directory will be held and managed by the Marine Coordinator, who will also be responsible for ensuring it is fully up to date at all times.

Organisation	Contact Name	Telephone (office hours)	Fax	24 hr. Telephone	Mobile / Pager / Email
BOWL					
Marine Coordinator					
Site Manager					
Project Manager					
Project SHE Manager					
Project Director					
Offshore SHE Manager					
SSE 24 HR Emergency Reporting Line					
Consents and Licensing Team					
ECoW					
Duty Tactical Incident Commander					
BOWL Key Contractors					
Marine Installation					
WTG					
Transmission					
Key Contractor Oil Spill Response Contractors					
MCA and Coastguard Centres					
CGOC Shetland	**Duty Officer**	**01595 692976**	**TBC**	**01595 692976**	shetland.coastguard@hmcg.gov.uk
CGOC Aberdeen	Duty Officer	01224 592334	TBC	01224 592334	aberdeen,coastguard@hmcg.gov.uk

Organisation	**Contact Name**	**Telephone (office hours)**	**Fax**	**24 hr. Telephone**	**Mobile / Pager / Email**
Maritime & Coastguard Agency (MCA)	Admin Operations Advice Scientific Advice Head of Counter Pollution & Response Branch	02380 329483 02380 329407 02380 329411 02380 329525	02380 329485 02380 329446 (MEOR)	TBC	If contact with MCA outside office hours is needed, then the relevant local coastguard office should be contacted.
RNLI (Wick)	-	01955 603723		01955 603723	
Marine Scotland					
Marine Scotland	Duty Officer	07770 733423 (mobile)	01224 295511	07770 733423 (mobile)	07770 733423 spillresponse@marlab.ac.uk
Department of Energy and Climate Change					
Department of Energy and Climate Change	Duty Officer	01244 254100	01244 254100	01224 254058 0207 215 3505	TBC
Ports					
Port of Wick	Harbour Master	01955 602030	01955 605936	01955 602030 (call divert out of hours)	
Environmental Agencies and Local Authorities					
SEPA	Pollution hotline	-	-	0800 80 70 60	-
	Dingwall Office	01349 862021	01349 863987		
	Elgin Office	01343 547663	01343 540884		
	Fraserburgh Office	01346 510502	01346 515444		
SNH	National Oil Spill Officer	0131 3162610	0131 3162690		07774 161273 (mobile) 07699

Organisation	Contact Name	Telephone (office hours)	Fax	24 hr. Telephone	Mobile / Pager / Email
					761509 (Pager)
Moray Council	Emergency contact	-	-	03457 565656	-
Highland Council	Emergency Planning Officer (Office Hours)/ Council Duty Officer (Out of Office Hours)	01463 713479	01463 243583	01463 713479	epu@highland.gov.uk
Aberdeenshire Council	Grampian Emergency Planning Unit	01224 633030			admin@gepu.sol.co.uk
Other Installations					
Beatrice and Jacky platform operators					
Beatrice Demonstrator turbines operator					
Other Contacts (for possible information and advice)					
International Tanker Owners Pollution Federation (ITOPF)	Main	0207 566 6999	-	07623 984 606	-
RSPB	North Scotland Regional Office, Inverness	01463 715000	-	-	-